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# Current Affairs (CONSOLIDATION)

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**(PART – II)**

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# Polity and Governance

## Highlights

- One Nation, One Student ID
- Nutrient Based Subsidy
- Atal Bhujal Yojana and Ground Water Management
- Women Reservation Act, 2023
- The 5T Initiative of Odisha
- Lok Sabha's Ethics Committee
- Pradhan Mantri Krishi Sinchayee Yojana
- New Made-In-India EV Charging Standard
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- Cabinet Approves Royalty Rates for Mining
- Information Commissions in India

## One Nation, One Student ID

### Why in News?

Recently, several state governments requested schools to seek parental consent for the creation of a **new student identity card known as the Automated Permanent Academic Account Registry (APAAR)**.

- This is part of the 'One nation, One Student ID' initiative of the Union government, stemming from the **new National Education Policy of 2020**.

### What is the Purpose of APAAR, the ID for Students?

- **About:**
  - Under the initiative, each student would get a **lifelong APAAR ID**, making it easy for the **learners, schools, and governments to track academic progress** from pre-primary education to higher education.
  - APAAR would also serve as a gateway to **Digilocker**, a digital system where students can store their important documents and achievements, such as exam results and report cards.
- **Need For Introduction:**
  - The goal behind introducing APAAR is to make **education hassle-free and reduce the need for students** to carry physical documents.

- The vision is to create a positive change, **allowing state governments to track literacy rates, dropout rates, and more**, helping them make improvements.
- APAAR also aims to **reduce fraud and duplicate educational certificates** by providing a single, trusted reference for educational institutions.

### How Will the APAAR ID Work?

- **Linkage with the Academic Bank Credit (ABC):**
  - Every individual will have a unique APAAR ID, which will be linked to the **Academic Bank Credit (ABC)**, which is a digital storehouse that contains information of the credits earned by students throughout their learning journey.
- **Change of Schools:**
  - If the student changes schools, whether within the state or to another state, all her data in the ABC **gets transferred to her new school just by sharing the APAAR ID**.
    - Students **won't need to provide physical documents** or transfer certificates.
- **Enrolment for APAAR:**
  - To sign up for APAAR, students will have to provide basic information such as name, age, date of birth, gender, and a photograph. This information will be verified using their **Aadhar number**.

Note:



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- Students will need to sign a consent form, and **they can choose to either accept or decline sharing their Aadhar number and demographic information** with the Ministry of Education for creating the APAAR ID.
  - For minors, parents will have to sign the consent form, allowing the Ministry to use the student's Aadhar number for authentication with UIDAI.
- Registration for creating an APAAR ID is **voluntary, not mandatory**.

### What are the Concerns Surrounding APAAR?

- **Issues of Privacy:**
  - Parents and students have concerns about sharing their Aadhar details because they worry that their personal information could be leaked to outside parties.
- **Concerns with UDISE+:**
  - The government says that the information shared by students **will be kept confidential** and will not be shared with any third party except for entities engaged in educational activities, such as the **Unified District Information System for Education Plus (UDISE+)** database.
    - But there are **no laid down guidelines** for UDISE+ to strictly adhere to in order to prevent any breach of data.

### United Information

#### System for Education Plus (UDISE+)

- It is **one of the largest Management Information Systems on school education**. It was launched in 2018-2019 to speed up data entry, reduce errors, improve data quality and ease its verification.
- It is **an application to collect the school details** about factors related to a school and its resources.
  - It is an **updated and improved version of UDISE, which was initiated in 2012-13** by the Ministry of Education.
- It **covers more than 1.49 million schools, 9.5 million teachers, and over 265 million students**.
- It helps **measure the education parameters from classes 1 to 12** in government and private schools across India.

## Nutrient Based Subsidy

### Why in News?

Recently, the union cabinet has approved **Nutrient Based Subsidy (NBS) rates** for the various nutrients of **Rabi and Kharif Season for 2022-23**.

- For Rabi Season **2022-23**: NBS approved for various nutrients i.e. **Nitrogen (N), Phosphorus (P), Potash (K) and Sulphur (S)**
- For **Kharif Season 2023**: NBS rates approved for Phosphatic and Potassic (P&K) Fertilizers.

### What is a Nutrient Based Subsidy (NBS) Regime?

**Nutrient Based Subsidy Scheme**

**About:**

- A fixed rate of subsidy (in ₹ per Kg) **decided on an annual basis**
- Being implemented since **2010**

**Aim:**

- Ensure the **availability of fertilisers** to farmers at an **affordable price**
- Increase consumption of P&K fertilizers to achieve optimum NPK ratio (4:2:1)

**Implemented by:**

- Department of Fertilisers, Ministry of Chemicals & Fertilizers

**Ambit of NBS:**

- Given on nutrients - Nitrogen, Phosphate, Potash and Sulphur
- For Phosphatic and Potassic (P&K) fertilisers
- Doesn't include Urea based fertilisers
- NBS is available for imported complex fertilisers except Ammonium Sulphate

**Fertilisers in India:**

- 3 basic fertilisers – Urea, Diammonium Phosphate (DAP), and Muriate of Potash (MOP)
- Urea is the **most – produced, consumed, imported and physically regulated** fertiliser of all
- Urea is subsidised only for agricultural uses

Nutrient	Main Source
Nitrogen (N)	Urea
Phosphorus (P)	DAP
Potassium (K)	MOP

### ➤ Significance:

- Availability of Subsidized P&K Fertilizers will ensure the availability of **DAP (Di-Ammonium Phosphate)** and other P&K fertilizers to farmers at subsidized, affordable, and reasonable prices during the Kharif season. This is essential to support agricultural productivity and **food security** in India.

Note:

- NBS subsidy is crucial for effective resource allocation and ensuring that subsidies are directed toward the **farmers who need them the most**, promoting efficient and **sustainable agricultural practices**.

### **What are the Issues Related to NBS ?**

- **Economic and Environmental Costs:**
  - The fertilizer subsidy, including the NBS policy, imposes a **significant financial burden** on the economy. It ranks as the second-largest subsidy after food subsidy, straining fiscal health.
  - Additionally, imbalanced fertilizer usage due to the pricing disparity has adverse **environmental consequences**, such as soil degradation and nutrient runoff, impacting long-term agricultural sustainability.
- **Black Marketing and Diversion:**
  - Subsidized urea is **susceptible to Black Marketing** and diversion. It is sometimes **illegally sold to bulk buyers**, traders, or non-agricultural users like plywood and animal feed manufacturers.
  - Moreover, there are **instances of subsidized urea being smuggled** to neighboring countries like Bangladesh and Nepal, leading to the loss of subsidized fertilizers intended for domestic agricultural use.
- **Leakage and Misuse:**
  - The NBS regime relies **on an efficient distribution system** to ensure that subsidized fertilizers reach the intended beneficiaries, i.e., farmers.
  - However, there may be instances of leakage and misuse, where subsidized fertilizers **do not reach farmers or are used for non-agricultural purposes**. This undermines the effectiveness of the subsidy and denies genuine farmers access to affordable fertilizers.
- **Regional Disparities:**
  - Agricultural practices, soil conditions, and crop nutrient requirements vary across different regions of the country.
  - Implementing a uniform NBS regime may not adequately address the specific needs and regional disparities, potentially leading to suboptimal nutrient application and productivity variations.

## **Atal Bhujal Yojana and Ground Water Management**

### **Why in News?**

Recently, the 5th meeting of the **National Level Steering Committee (NLSC)** of **Atal Bhujal Yojana (ATAL JAL)** was held to review the **overall progress** of the scheme.

- The **World Bank** has been involved in the review of the program. The committee encouraged states to integrate **Water Security Plans (WSPs)** into the Gram Panchayat Development Plans which will ensure the sustainability of the scheme's approach even after the program's completion.

### **What is Atal Bhujal Yojna?**

- **About:**
  - ATAL JAL is a **Central Sector Scheme** for facilitating sustainable ground water management with an outlay of Rs. 6000 crore.
  - It is being implemented by the **Ministry of Jal Shakti**.
    - The scheme is being funded by the **Government of India** and the **World Bank** on a **50:50** basis.
    - The entire World Bank's loan component and central assistance will be passed on to the States as grants.
- **Objectives:**
  - It aims to improve the management of groundwater resources in select water stressed areas in identified states viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.
  - ATAL JAL promotes **panchayat led** groundwater management and **behavioural change** with a primary focus on demand-side management.

### **What is the Status of Groundwater Depletion in India?**

- **Groundwater Depletion** in India is a **major concern** because it is the primary source of drinking water. Some of the main causes of groundwater depletion in India include over-extraction of groundwater for irrigation, **Urbanisation**, and **Climate Change**.
- **India is the world's largest user of groundwater**, exceeding the use of the United States and China combined according to **recent UN report**.

Note:



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- According to the **Central Ground Water Board (CGWB)** of India, approximately 70% of the total water used in India is from groundwater sources.
  - However, the CGWB also estimates that around 25% of the country's total **groundwater extraction is unsustainable**, meaning that it is being extracted at a faster rate than it can be replenished.
- Overall, groundwater depletion in India is a **serious problem that needs to be addressed through sustainable water management practices**, such as improved irrigation techniques and conservation efforts.

### **What are the Major Causes of Groundwater Depletion in India?**

- Over-Extraction of Groundwater for Irrigation:
  - Irrigation accounts for around **80% of total water use in India**, and much of this water is sourced from groundwater.
  - As demand for food continues to grow, more and more groundwater is being extracted for irrigation, leading to depletion.
    - According to the **UN's Interconnected Disaster Risks Report 2023**, 78% of wells in Punjab are considered overexploited, and the north-western region as a whole is predicted to experience critically low groundwater availability by 2025.
- **Climate Change:**
  - Rising temperatures and **Changing Precipitation Patterns** can alter the recharge rates of **Groundwater Aquifers**, making them more vulnerable to depletion.
  - Droughts, flash floods, and **Disrupted Monsoon Events** are recent examples of climate change events that are placing pressure on India's groundwater resources.
- **Poor Water Management:**
  - Inefficient use of water, leaky pipes, and inadequate infrastructure for capturing and storing rainwater can all contribute to groundwater depletion.
- **Decrease in Natural Recharge:**
  - The natural recharge of groundwater aquifers can be decreased by factors such as **Deforestation**, which can lead to **Soil Erosion** and reduce the amount of water that is able to seep into the ground and replenish the aquifers.

### **What are the Issues**

#### **Associated with Depleting Ground Water?**

- **Water Scarcity:** As groundwater levels drop, there may not be enough water available for domestic, agricultural, and industrial use. This can lead to **water shortages and conflicts** over water resources.
  - A study led by the University of Michigan warns that if **Indian farmers continue to draw groundwater at the current rate**, the rate of groundwater depletion could triple by 2080. This could have severe implications for the **country's food and water security, as well as the livelihoods of over one-third of its population**.
- **Land Subsidence:** When groundwater is extracted, the **soil can become compacted, leading to Land Subsidence** (the sinking or settling of the land). This can cause damage to infrastructure, such as roads and buildings, and can also increase the risk of flooding.
- **Environmental Degradation:** Depleting groundwater can also have negative impacts on the environment. For example, when groundwater levels drop, it can cause **Saltwater Intrusion** in coastal areas, leading to the contamination of freshwater resources.
- **Economic Impacts:** Groundwater depletion can also have **economic impacts**, as it can lead to reduced agricultural production and increased costs for water treatment and pumping.
- **Lack of Depletion Data:** The Indian government regulates **groundwater exploitation by "notifying" highly overexploited blocks** in water-stressed states.
  - However, only about 14% of overexploited blocks are currently notified.
- **Earth's Axis to Tilt:** According to a recent study in Geophysical Research Letters, it is claimed that excessive pumping of groundwater has caused the **Earth's axis to tilt nearly 80 centimeters east** between 1993 and 2010 alone and contributes to sea level rise.

#### **What are the Government Initiatives Related to Groundwater Conservation?**

- **Pradhan Mantri Krishi Sinchayee Yojana**
- **Jal Shakti Abhiyan- Catch the Rain Campaign**
- **Aquifer Mapping and Management Programme**
- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**

Note:



## Women Reservation Act, 2023

# WOMEN Reservation Act, 2023

(106<sup>th</sup> Constitutional Amendment Act)

### OBJECTIVE

- Reserve 1/3rd of total seats in LS and state Legislative Assemblies (LAs) for women

### BACKGROUND

- Bill previously introduced in: 1996, 1998, 2009, 2010, 2014
- Related Committees:
  - Committee on the Status of Women in India (1971)
  - Committee under Margaret Alva (1987)
  - Geeta Mukherjee Committee (1996)
  - Committee on the Status of Women (2013)

### Key Features

#### Articles Inserted:

- Article 330A - Reservation for Women in LS
- Article 332A - Reservation for Women in State LAs
- Article 239AA - Reservation for Women in NCT of Delhi
- Article 334A - Reservations to become effective after delimitation is undertaken and Census is conducted

#### Time Period:

- Reservation to be provided for 15 years (can be extended)

#### Rotation of Seats Reserved:

- After each delimitation

### NEED

- Political Underrepresentation:
  - Only 82 Women MPs in LS (15.2%) and 31 in RS (13%)
  - On avg, women constitute only 9% of the total members in State LAs



### ARGUMENTS

#### In Favour:

- Vital step towards gender equality
- Broader range of perspectives to the decision-making process
- Helps eliminate discrimination against women in political/public life

#### Against:

- Delimitation based on 2021 census (yet to be conducted) is mandatory
- No women's reservation in RS and State Legislative Councils

### STEPS AHEAD

- Reservation for women within political parties
- Independent political decision-making by women; overcoming Sarpanch-patrim



Note:

## The 5T Initiative of Odisha

### Why in News?

The 5T initiative in Odisha is a governance model that stands for **Teamwork, Transparency, Technology, Time, and Transformation**, launched with the aim of improving governance and ensuring efficient delivery of public services.

- In sync with the 5T agenda, in October 2019, the Odisha government launched the '**Mo Sarkar**' or '**My Government**' initiative, which is also seen as a **Niti Aayog Like Model at the State Level**.
- In 2022, the Odisha Government Chief added another **T (Tour)** to the 5T Initiative and gave them **6T-Mantra**, asking the Ministers to 'Tour' more and work towards strengthening the grassroots further.

### What is the 5T Initiative?

- **Teamwork:**
  - It emphasises the **need for different departments and agencies within the government to work together** as a cohesive team.
  - It promotes collaboration and coordination among various government entities to **address the needs of the people effectively**.
- **Transparency:**
  - Transparency is a **crucial element of the 5T initiative**. It focuses on making government **processes and decisions more open** and accountable to the public.
  - This includes **providing easy access to information**, reducing bureaucratic red tape, and **promoting ethical and accountable conduct** within the government.
- **Technology:**
  - It encourages the **adoption of modern technology and digital solutions** to streamline government operations, enhance service delivery, and make processes more efficient.
- **Time:**
  - The time aspect underscores the **importance of delivering services in a timely manner**. The 5T model aims to reduce delays and ensure that government services are provided to citizens promptly.
- **Transformation:**
  - Ultimately, the 5T initiative seeks to bring about a transformation in the functioning of government

agencies and departments. It aims to make the government more responsive, citizen-centric, and results-oriented.

### What is the Mo Sarkar Initiative?

- It is a governance program **aimed at transforming the way government services are delivered** and improving the accountability and transparency of public offices.
  - "Mo Sarkar" means "My Government" in the local language.
- One of the notable features of the "Mo Sarkar" initiative is the **real-time feedback mechanism**.
  - The government makes the phone numbers of citizens who interact with government offices **available to top officials, including the Chief Minister**.
- This feedback mechanism helps **identify issues, assess the performance of government officers**, and take remedial action when necessary.
- The "Mo Sarkar" initiative is seen as a **way to shift power away from the bureaucracy back to the people** and make governance more evidence-based, efficient, and equitable.

### What is the Agenda for the Implementation of Niti Aayog Like Body in States?

- **The National Institution for Transforming India (NITI Aayog)** will assist each state to set up similar bodies, replacing their planning boards for faster and inclusive economic growth along with the vision of becoming a developed nation by 2047.
- Initially, it aims for **8-10 states to set up such bodies**, before reaching out to all by March 2023.
  - Four states i.e., **Karnataka, Uttar Pradesh, Madhya Pradesh and Assam** have already begun work in this regard.
  - Maharashtra, Odisha, Andhra Pradesh and Gujarat will likely begin work soon.
- A plan has been **chalked out by NITI Aayog to:**
  - Help in the creation of teams that will examine the existing structure of state planning boards.
  - Conceptualise the State Institution for Transformation (SIT) in the next 4-6 months.
    - Lateral entry of professionals will be encouraged in SITs to undertake high-quality analytical work and policy recommendations.

Note:

- Besides reorienting state planning boards as **SITs**, a **blueprint will be made on:**
  - Guiding states in policy formulation.
  - Monitoring and evaluation of government policies and programmes.
  - Suggesting better technology or models for delivery of schemes.

### ***What is the Need for Setting up NITI Aayog-like Bodies in States?***

- States are the **Indian economy's growth drivers**. The national **gross domestic product (GDP)** growth is an aggregation of states' rates of growth except for sectors like defence, railways and highways.
  - Health, education and skilling are **primarily with the state government**.
- State governments' role is **critical to improving ease of doing business**, land reforms, infrastructure development, credit flows and urbanisation, all of which are vital for sustained economic growth.
- Most states so far have done little to rejuvenate their planning departments/boards, which earlier dealt with the **Planning Commission** and prepared parallel state five year-plans with the Centre.
  - Most states' planning departments, with huge manpower, are **almost defunct and have no clarity on what work they will do**.

#### **What are Some of the Similar Initiatives in Other States?**

- **Kerala State Planning Board:**
  - The primary role of the Board encompasses the **formulation of both Five-Year and Annual Plans**, along with the preparation of an annual Economic Review.
  - It diligently oversees the execution of these Plans, collaborating closely with various Departments on Plan schemes and overseeing the operations of the Decentralisation Cell.
  - Additionally, the Board conducts commissioned studies, offers valuable insights and recommendations regarding externally aided programs and centrally sponsored schemes, while also compiling policy briefs for the Chairperson.

#### **Sakala Mission:**

- Karnataka State Government launched **Sakala Mission** to provide guarantee of **services to citizens** in the State of Karnataka **within the stipulated time limit** and for matters connected therewith and incidental thereto.
- This Act is called the **Karnataka Guarantee of Services to Citizens Act, 2011**.

## **Lok Sabha's Ethics Committee**

### ***Why in News?***

Recently, **Lok Sabha's Ethics Committee** has initiated investigation over **'Cash for Query'** allegations on a Member of Parliament (MPs) accused of accepting **"Bribes" to ask questions in Parliament**.

- The committee will conduct proceedings to investigate the allegations and gather evidence from all relevant parties, including the complainant, witnesses, and the accused MP.

### ***What are the Potential Outcomes?***

- If the Ethics Committee finds merit in the complaint, it can make recommendations. The potential punishment it can recommend typically involves **Suspension of the MP for a specified period**.
- The House, which includes all MPs, will ultimately decide whether to accept the committee's recommendation and determine the nature and extent of the punishment, if any.
- If the accused were to be expelled or face a potentially adverse decision, she could **challenge it in a court of law**.
  - The grounds for challenging such a decision in court are limited and **typically include claims of unconstitutionality**, gross illegality, or a denial of natural justice.

**Note:** In 2005, the two Houses adopted motions to expel 10 Lok Sabha MPs and one Rajya Sabha MP who were accused of agreeing to ask questions in Parliament for money. The motion in Lok Sabha was based on the **Bansal Committee's report**, a **special committee** set up by the Speaker to examine the issue.

- In Rajya Sabha, the complaint was examined by the House Ethics Committee.
- The expelled MPs, demanded that the **Bansal Committee's report** be sent to the Privileges Committee, so that the parliamentarians **could defend themselves**.

Note:



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### What is Lok Sabha's Ethics Committee?

#### ➤ About:

- The members of the Ethics Committee are appointed by the **Speaker for a period of one year**.

#### ➤ History:

- A Presiding **Officers' Conference held in Delhi in 1996** first mooted the **idea of ethics panels** for the two Houses (Lok Sabha and Rajya Sabha)
- Then Vice President (and Rajya Sabha Chairman) K R Narayanan constituted the **Ethics Committee of the Upper House** on 4<sup>th</sup> March, 1997 to oversee the **Moral and Ethical conduct of members** and examine cases of misconduct referred to it.
  - In the case of Lok Sabha, a study group of the house committee of **privileges in 1997** recommended the constitution of an **Ethics committee, but it could not be taken up by Lok Sabha**.
- The Committee of Privileges **finally recommended the constitution of an Ethics Committee** during the 13<sup>th</sup> Lok Sabha.
- The late Speaker, G M C Balayogi, constituted an **ad hoc Ethics Committee** in 2000, which became a permanent part of the House only in 2015.

#### ➤ Procedure for Complaints:

- Any person can **complain against a Member** through another Lok Sabha MP, along with **evidence of the alleged misconduct**, and an affidavit stating that the complaint is not **"false, frivolous, or vexatious"**.
  - If the Member himself complains, the affidavit is not needed.
- The Speaker can refer to the Committee **any complaint against an MP**.
- The Committee does not entertain complaints based only on media reports or on matters that are sub judice. The Committee makes a **Prima Facie inquiry before deciding to examine** a complaint. It makes its recommendations after evaluating the complaint.
- The Committee presents its report to the Speaker, who asks the House if the report should be taken up for consideration.
  - There is also a **provision for a half-hour discussion** on the report.

#### ➤ Overlap with Privileges Committee:

- The work of the Ethics Committee and the

**Privileges Committee** often overlap. An allegation of corruption against an MP can be sent to either body, but usually more serious **accusations go to the Privileges Committee**.

- The mandate of the Privileges Committee is to **safeguard the "freedom, authority, and dignity of Parliament"**.
- These privileges are enjoyed by individual Members as well as the House as a whole. An MP can be examined for **Breach of Privilege**; a non-MP too can be accused of breach of privilege for actions that attack the authority and dignity of the House.
- The Ethics Committee can take up only cases of misconduct that involve MPs.

## Pradhan Mantri Krishi Sinchayee Yojana

### Why in News?

Recently, the **Cabinet Committee on Economic Affairs (CCEA)** has approved the inclusion of the **Jamrani Dam Multipurpose Project in Uttarakhand** under the **Pradhan Mantri Krishi Sinchayee Yojana-Accelerated Irrigation Benefit Programme (PMKSY-AIBP)**.

- The Project involves the construction of a Dam near **Jamrani village**, across the River Gola, a tributary of the River Ram Ganga. The dam will serve as a source of water for the existing Gola Barrage and is expected to **generate 14 MW of hydropower**.

### What is Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)?

#### ➤ About:

- PMKSY was launched in 2015 with the goal of enhancing access to water for farming, expanding the cultivable area under assured irrigation, improving water use efficiency, and **promoting sustainable water conservation practices**.
- It is a **Centrally Sponsored Scheme (Core Scheme)**, where Centre- States share will be 75:25.
  - In the case of the north-eastern region and hilly states, the share will be 90:10.
- In 2020, the Ministry of Jal Shakti launched a mobile application for **Geo-Tagging of the components of projects under PMKSY**.

Note:



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## EMPOWERING FARMERS

### PRADHAN MANTRI KRISHI SINCHAYEE YOJANA



- ▶ **Convergence of investments in irrigation at the field level**
- ▶ **Expansion of cultivable area under assured irrigation**
- ▶ **Improving on-farm water use efficiency to reduce wastage of water**
- ▶ **Encouraging precision-irrigation and other water saving technologies.**
- ▶ **Around 35 Lakh hectare of land irrigated using water saving methods since 2015**
- ▶ **Total 9.38 Lakh hectare of land covered under micro irrigation methods in 2020-2021**



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#### ➤ Objectives:

- Achieve convergence of investments in irrigation at the field level (preparation of district level and, if required, sub district level water use plans).
- Enhance the **physical access of water on the**

**farm and expand cultivable area** under assured irrigation (Har Khet ko pani).

- Integration of water source, distribution and its efficient use, to make best use of water through appropriate technologies and practices.

Note:



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- Improve **on - farm water use efficiency** to reduce wastage and increase availability both in duration and extent.
- Enhance the adoption of precision - irrigation and other water saving technologies (More crop per drop).
- Enhance **recharge of aquifers and introduce sustainable water conservation** practices.
- Ensure the **integrated development of rainfed areas** using the watershed approach towards soil and water conservation, regeneration of groundwater, arresting runoff, providing livelihood options and other NRM activities.
- Promote extension activities relating to water harvesting, water management and crop alignment for farmers and grass root level field functionaries.
- Explore the **feasibility of reusing treated municipal wastewater** for peri - urban agriculture.
- **Components:**
  - **Accelerated Irrigation Benefit Programme (AIBP):** It was launched in 1996 with the aim of accelerating the **implementation of irrigation projects** that exceed the resource capabilities of states.
    - To date, 53 projects have been completed under PMKSY-AIBP, generating an additional irrigation potential of 25.14 lakh hectares.
  - **Har Khet ko Pani (HKKP):** It aims to create **new water sources through Minor Irrigation**. Repair, restoration and renovation of water bodies, strengthening carrying capacity of traditional water sources, **constructing rain water harvesting structures**.
    - It has sub components: Command Area Development (CAD), Surface Minor Irrigation (SMI), Repair, Renovation and Restoration (RRR) of Water Bodies, Ground Water Development.
  - **Watershed Development:** It is the effective management of **runoff water and improved soil & moisture conservation activities** such as ridge area treatment, drainage line 5 treatment, rain water harvesting, in - situ moisture conservation and other allied activities on watershed basis.
- **Formulation:** It was formulated by amalgamating following schemes:
  - **Accelerated Irrigation Benefit Programme (AIBP)** - Ministry of Water Resources, River Development & Ganga Rejuvenation (now Ministry of Jal Shakti).

- **Integrated Watershed Management Programme (IWMP)** - Department of Land Resources, Ministry of Rural Development.
- **On-Farm Water Management (OFWM)** - Department of Agriculture and Cooperation (DAC).
- **Implementation:**
  - Decentralized implementation through State Irrigation Plan and District Irrigation Plan.

#### What are the Other Initiatives Related to Agriculture?

- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**
- **National Mission on Sustainable Agriculture**
- **Paramparagat Krishi Vikas Yojana (PKVY)**
- **Sub-mission on AgroForestry (SMAF)**
- **Rashtriya Krishi Vikas Yojana**
- **AgriStack**
- **Digital Agriculture Mission**
- **Unified Farmer Service Platform (UFSP)**
- **National e-Governance Plan in Agriculture (NeGP-A)**

## New Made-In-India EV Charging Standard

### Why in News?

The **Bureau of Indian Standards (BIS)** has recently approved a groundbreaking charging connector standard for **Light Electric Vehicles (LEVs)**, including scooters, bikes, and rickshaws.

### What is India's New EV Charging Standard?

- **About:**
  - Named **ISI7017 (Part 2/Sec 7): 2023**, this standard is a result of collaboration among **NITI Aayog, the Department of Science and Technology, Ather Energy (a private firm), and other stakeholders**.
- **Unique Features of India's New EV Charging Standard:**
  - Remarkable feature of India's new EV charging standard is its **ability to combine alternating current (AC) and direct current (DC) charging for LEVs**.
  - This approach, akin to globally established standards for electric cars, **enhances interoperability and compatibility** among various EV models and charging infrastructure providers.

Note:



### ➤ Consequences of Diverse Charging Standards:

- India's EV manufacturers, unlike those in some other countries, are **not obligated to adhere to a specific charging standard**. This results in different charging standards for EVs from different companies, paralleling the past situation of Apple and Android smartphones.
  - For example, **Ola Electric, Ather Energy, and Ultraviolet Automotive** all employ distinct charging standards for their EVs.

### What are Different Charging Standards Worldwide?

#### ➤ China:

- China uses a **national standard for EV charging connectors** that is called **GB/T**, effectively addressing

range anxiety with a dense network of charging stations.

#### ➤ United States:

- While **there isn't a national standard**, collaboration between EV manufacturers like Ford and General Motors aims to establish common standards.

#### ➤ Europe:

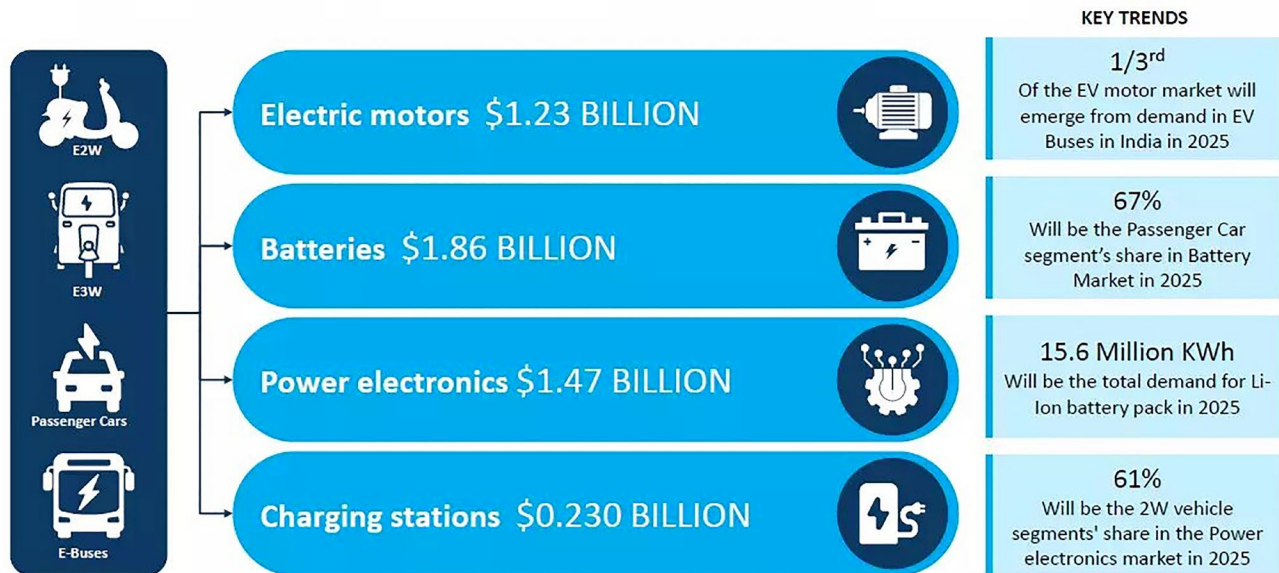
- The **Combined Charging System (CCS) standard dominates in Europe**, backed by the **European Union**, promoting uniformity.

#### ➤ Japan:

- Japan **employs the CHAdeMO standard**, though **it's being phased out in North America** in favor of more common standards.

## PERSPECTIVE: MARKET SIZE OF EV COMPONENT INDUSTRY IN 2025

ELECTRIC VEHICLE VALUE CHAIN IN INDIA IS EXPECTED TO REACH \$4.8 BILLION IN 2025



### What are Some Government Initiatives to Promote EV Adoption?

- **The Faster Adoption and Manufacturing of Electric Vehicles (FAME)scheme II**
- **The National Electric Mobility Mission Plan (NEMMP)**
- **The National Mission on Transformative Mobility and Battery Storage**
- **Production Linked Incentive (PLI) scheme**
- **The Vehicle Scrappage Policy**
- **Go Electric campaign**
- **Global EV30@30 campaign**

Note:

- The Ministry of Power, in its **revised guidelines on charging infrastructure (MoP Guidelines)**, has prescribed that at least one charging station should be present in a grid of 3 km and at every 25 kms on both sides of the highways.
- The Ministry of Housing and Urban Affairs has also amended the **Model Building Bye-laws, 2016 (MBBL)** to mandate **setting aside 20% of the parking space** for EV charging facilities in residential and commercial buildings.

## Medical College Seats and New Regulations in India

### Why in News?

Recently, the **National Medical Commission (NMC)** has issued guidelines putting a hold on **new medical colleges** and expansion of existing colleges in states with **more than 100 medical education seats** per million population.

- Earlier, **NMC also issued new guidelines on professional conduct for doctors**, which mandate them to prescribe only generic drugs instead of specific brands.

### What is the Scenario of Medical Colleges in States?

- **States with Excess Medical College Seats:**
  - At least 13 states and Union Territories in India have more than **100 seats per million population**, rendering them ineligible for capacity expansion.
    - Tamil Nadu has the highest number of medical college seats (11,225), followed by Karnataka (11,020), and Maharashtra (10,295).
- **States with Deficient Medical College Seats:**
  - There is an acute shortage of medical college seats in relation to population in **Meghalaya, Bihar, and Jharkhand**, where the deficit is more than 75%.
    - Meghalaya, with a population of approximately 33.5 lakh, has only 50 medical college seats.
    - Bihar and Jharkhand, with populations of 12.7 crore and 3.9 crore, have 2,565 and 980 medical college seats, respectively.
    - Uttar Pradesh, the most populous state, has 9,253 seats, **with a 61% deficit**.

### What are the NMC Guidelines?

- In August 2023, the NMC issued regulations that set **population-to-seats ratios** for medical colleges.
- States with more than 100 medical education seats **per million population are restricted from expanding their medical education capacity**.

- The NMC argues that these guidelines are **intended to bring down regional disparities** and ensure effective quality medical education.
- The NMC's regulations will apply to new medical colleges and seat expansions starting from the 2024-25 academic session.
- The regulations do not require **states with excess seats to shut down colleges** or reduce existing seats.

### What is the National Medical Commission (NMC) ?

- The NMC has been constituted by an act of Parliament known as **National Medical Commission Act, 2019**.
- The NMC acts as India's top regulator of medical education and practice.
- Committed to upholding the highest standards in healthcare education, NMC ensures the delivery of quality medical education and training across the nation.

## The Bharatiya Nyaya Sanhita, 2023

### Why in News?

Recently, a Parliamentary Committee has reviewed the **Bharatiya Nyaya Sanhita (BNS) 2023 Bill**, proposing significant changes to **India's Criminal Justice System**, recommendations including a **gender-neutral provision criminalizing adultery**.

- The BNS Bill, introduced by the Ministry of Home Affairs, seeks to replace the **colonial-era IPC (Indian Penal Code)**.

### What are the Key Highlights of the Proposed Changes in BNS?

- **Adultery and Gender-Neutral Provision:**
  - The parliamentary committee has recommended including a gender-neutral provision that criminalizes **Adultery**.

Note:



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- This move comes after the **Supreme Court (SC)** declared **Section 497 of the Indian Penal Code (IPC)**, which criminalized adultery, as **unconstitutional in 2018**.
- The panel seeks to **protect the institution of marriage** but in a gender-neutral way.
- **Non-Consensual Sex and Bestiality:**
  - The committee is considering a clause to criminalize **non-consensual sex between men, women, or transpersons**, as well as acts of bestiality.
  - This indicates an effort to **address various forms of sexual offenses** comprehensively.
- **Definition of Terms:**
  - The committee has suggested better definitions for terms like **"community service"** and **"life imprisonment"** in the bill.
- **Positive Changes:**
  - The new draft code has included the removal of **Section 124A (Sedition)** and provisions for prosecuting offenses committed in foreign countries.

### ***What are the Arguments for Legalizing and Criminalizing Adultery?***

- **Legalizing Adultery:**
  - **Individual Autonomy and Privacy:** The Supreme Court, in **Joseph Shine vs. The Union of India**, 2018 judgment recognized the importance of individual autonomy and the right to privacy.
  - Legalizing adultery acknowledges the **right of adults to make decisions about their personal relationships** without state interference.
    - The court said that the 158-year-old law was unconstitutional and is violative of Article 21 (Right to life and personal liberty) and Article 14 (Right to equality).
  - **Doctrine of Coverture:** Section 497 of the **IPC (Indian Penal Code)** is based on the Doctrine of Coverture.
    - This doctrine, not recognised by the Constitution, holds that a woman loses her identity and legal right with marriage, is violative of her fundamental rights.
  - **Human Liberty:** According to the Supreme Court (SC), Marriage does not mean **ceding autonomy of one to the other**.

- Ability to make sexual choices is **essential to human liberty**. Even within private zones, an individual should be allowed her choice.
- The SC observes that "Society imposes impossible virtues on a woman, raises her to a pedestal. Confines her to spaces. Objectifies her and says she should be pure. But society has no qualms to commit rape, honour killings, sex-determination and infanticide".
- **Deterrence Effect:** Legalization could eliminate the chilling effect of the law on individuals who **may be reluctant to leave abusive or unhappy marriages** due to the fear of legal consequences.
  - It might encourage open communication and **resolution of marital issues**.
- **Reducing Judicial Burden:** Adultery cases used to burden the legal system. Legalizing it can free up the courts to address more pressing issues and cases.
- **Criminalizing Adultery:**
  - **Preservation of Marital Sanctity:** Adultery can harm the **institution of marriage**, leading to broken families and emotional trauma for the spouse and children. Criminalizing it can be seen as a means to protect the sanctity of marriage.
  - **Gender Protection:** It is argued that criminalizing adultery is a means to protect women from unfaithful spouses who **might otherwise abandon them**, leaving them economically vulnerable.
  - **Moral and Societal Values:** It is argued that the adultery law upholds **traditional moral and societal values**, which are still important to many in Indian society.
    - Criminalizing adultery could be viewed as a way to protect and preserve the family structure, which is considered a fundamental building block of society.

## **Line of Duty Compensation for Agniveer**

### ***Why in News?***

Recently, an Agniveer passed away on **duty at the Siachen glacier**, which sparked a controversy regarding the **entitlement of pensions and Compensation for the families of Agniveers**.

Note:



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- In 2022, the government unveiled the **Agnipath Scheme** for recruiting soldiers (Agniveers) across the **Three services (Army, Navy and Airforce)**.

### ***What Compensation is Promised After the Demise of an Agniveer?***

- **Seva Nidhi:**
  - An Agniveer's family is entitled to several forms of compensation, including a **non-contributory insurance sum of Rs 48 lakh, Rs 44 lakh** as compensation, and 30% of **Seva Nidhi** contributed by the Agniveer, with an equal matching contribution by the government.
  - Additionally, interest accrues on these amounts.
- **Armed Forces Battle Casualty Fund:**
  - The family also receives pay for the remaining tenure from the date of death, amounting to over **Rs 13 lakh, as well as a contribution of Rs 8 lakh** from the **Armed Forces Battle Casualty Fund**.
- **Army Wives Welfare Association:**
  - To provide immediate financial assistance, the Army Wives Welfare Association offers Rs 30,000 to the next of kin.

### ***What is the Agnipath Scheme?***

- **About:**
  - It allows patriotic and motivated youth to serve in the **Armed Forces for a period of four years**. Youth will be able to be recruited into the army for a short duration.
  - Under the new scheme, around 45,000 to 50,000 soldiers will be recruited annually, and most will leave the service in just four years.
- **Eligibility Criteria:**
  - It is only for personnel **below officer ranks** (those who do not join the forces as commissioned officers).
    - Commissioned officers are the army's highest ranked officers.
    - Commissioned officers hold an exclusive rank in the Indian armed forces. They often hold a commission under the president's sovereign power and are officially instructed to protect the country.
  - Aspirants between the **ages of 17.5 years and 21 years** will be eligible to apply.

### ***Objectives:***

- It aims at providing an **opportunity to the patriotic and motivated youth** with the 'Josh' and 'Jazba' to join the Armed Forces.
- It is expected to bring down the **average age profile of the Indian Armed Forces** by about 4 to 5 years.
- The scheme envisions that the average age in the forces is 32 years today, which will go down to 26 in six to seven years.

### ***Benefits for Agniveers:***

- Upon the completion of the 4-years of service, a one-time 'Seva Nidhi' package of Rs 11.71 lakhs will be paid to the Agniveers that will include their accrued interest thereon.
- They will also get a Rs 48 lakh life insurance cover for the four years.
- In case of death, the payout will be over Rs 1 crore, including pay for the unserved tenure.
- The government will help rehabilitate soldiers who leave the services after four years.

### ***What are the Concerns Related to Agniveers?***

- **Difficult to Find Another Job:**
  - The 'Agnipath' initiative paves the path for the enlistment of approximately 45,000 personnel into the Army, Navy, and Air Force in its inaugural year.
  - However, these recruits will serve on a **temporary four-year contract**. Upon the fulfillment of their contract, 25% of them will be retained, while the **remaining will exit the armed forces**.
- **No Pension Benefit:**
  - Those hired under the 'Agnipath' scheme will be given a **one-time lump sum of a little more than Rs 11 lakh** when they end their four-year tenure.
  - However, they do not receive any pension benefits. For most, seeking a second job is essential to support themselves and their families.
- **Training May Remain Unutilized:**
  - Forces will lose experienced soldiers.
  - The jawans joining the Army, Navy and Air Force will be given technical training so that they are able to support the ongoing operations.
  - Women are yet to be inducted under this scheme.

Note:



## Questioning in Parliament

### Why in News?

Recently, one of the **Member of Parliaments (MPs)** has been questioned by the **Central Bureau of Investigation (CBI)** and the **Lok Sabha Ethics Committee**, in her alleged involvement in 'cash for query' allegations.

- The member had allowed an individual to use her parliamentary login and password to **post questions on her behalf** in the Lok Sabha with the intention of furthering a particular agenda or receiving compensation for doing so.
- These allegations raised concerns about the ethical conduct of parliamentarians and the potential misuse of their positions for personal gain.

### What is the Procedure for Raising Questions in Parliament?

- **Procedure:**
  - **Rules of Procedure and Conduct of Business in Lok Sabha:** The procedure for raising questions is governed by **Rules 32 to 54 of the "Rules of Procedure and Conduct of Business in Lok Sabha"** and Directions 10 to 18 of the "Directions by the Speaker, Lok Sabha".
    - To ask a question, an MP has to first **give a notice addressed to the lower house's Secretary-General**, intimating their intention to ask a question.
    - The notice usually contains the text of the question, the official designation of the Minister to whom the question is addressed, the date on which the answer is desired, and the order of preference, in case the MP tables more than one notice of questions for the same day.
    - MPs can **submit up to five notices of questions (both oral and written) for a single day**. Notices exceeding this limit are considered for subsequent days within the same session.
  - **Notice Period:** Typically, the notice period for a question is **not less than 15 days**.
    - MPs can submit their notices either through an online 'Member's Portal' or by using printed forms from the Parliamentary Notice Office.

- The Speaker of Lok Sabha reviews the notices and determines their admissibility based on established rules.

#### ➤ Conditions for Question Admissibility:

- Questions must not **exceed 150 words** and should avoid containing arguments, defamatory statements, or references to personal conduct, except in an official or public capacity.
- Questions that pertain to broad policy issues are not admissible due to the impracticality of addressing complex policies within a brief answer.
- Questions cannot concern matters under judicial consideration or before parliamentary committees. They should also **avoid seeking information that could undermine national unity and integrity**.

**Note:** In Rajya Sabha, the admissibility of questions is governed by **Rules 47-50 of the Rules of Procedure and Conduct of Business** in the Council of States. Among various norms, the question **"shall be pointed, specific and confined to one issue only"**.

### What are the Categories of Questions?

- **Starred Question:**
  - A starred question is asked by an MP and **answered orally** by the Minister-in-charge. Each MP is allowed to **ask one starred question** per day. When a question is answered orally, **supplementary questions can be asked thereon**.
- **UnStarred Question:**
  - The MP seeks a **written answer**, which is deemed to be laid on the table of the House by the concerned minister and **supplementary questions cannot be followed**.
- **Short Notice Question:**
  - These are on an urgent matter of public importance, and an **oral answer is sought**. For asking such a question, a notice of less than 10 days is prescribed as the minimum period.
- **Question to Private Member:**
  - A question can be addressed to a private member under Rule 40 of Lok Sabha's Rules of Procedure, or under Rule 48 of Rajya Sabha's Rules, provided that the question deals with a subject relating to some Bill, resolution or other matter for which that member is responsible.

Note:





### What is the Significance of Raising Questions?

- **Parliamentary Right:**
  - Asking questions is an inherent and **unrestricted parliamentary right of MPs**, serving as a tool for legislative control over executive actions.
- **Functions of Questioning:**
  - This exercise allows MPs to **acquire information on government activities**, critique policies, highlight government shortcomings, and prompt ministers to take steps for the common good.
- **Government's Perspective:**
  - For the government, questions provide insight into public sentiment regarding policies and administration. They can lead to the formation of parliamentary commissions, inquiries, or the enactment of legislation.

## Reforms in Special and Local Laws

### Why in news?

Recently, several Bills have been tabled for reforming substantive criminal law as codified in the **Indian Penal Code (IPC)**, **Code of Criminal Procedure (CrPC)** and **Indian Evidence Act (IEA)**, but **Special and Local Laws (SLLs)** have been largely neglected.

### What are Special and Local Laws (SLLs)?

- **About:**
  - SLLs are specifically designed to address region-specific, cultural, or unique legal matters within a particular state or local area.
  - They are distinct from the **general laws and regulations** outlined in the **Indian Penal Code (IPC)**.
  - It identifies **Criminal Activities** that the state government frames for specific issues.
- **Significance:**
  - SLLs constitute a **crucial part of India's Criminal Justice System**, encompassing the most critical offenses and procedures. They are immensely relevant in the **Indian Criminal Justice System**.
  - Nearly **39.9% of all Cognisable Offenses** registered in 2021 were under SLLs.

- In **Cognisable Offences**, an officer can take **cognizance of and arrest a suspect without seeking a court's warrant** to do so, if she has "reason to believe" that the person has committed the offence and is satisfied that the arrest is necessary on certain enumerated bases.
- Within 24 hours of the arrest, the officer must have detention ratified by a judicial magistrate.

### What is the Need for Reforms in Special and Local Laws in India?

- **Ambiguous Definitions:**
  - Some SLLs, such as the **Unlawful Activities (Prevention) Act, 1967** suffer from deficient, ambiguous, and **vague definitions of offenses** and terms like '**terrorist act**,' '**unlawful activity**,' and '**organized crime**.'
  - These ambiguities can lead to **misuse and misinterpretation**, affecting the due process of law.
- **Variability in legal process**
  - SLLs can result in different treatment for individuals or groups based on their geographical location, leading to disparities in access to justice and legal protection.
  - The lack of legal consistency can create uncertainty for individuals and businesses, making it difficult to navigate legal rights and obligations.
- **Inherently Indiscreet:**
  - The absence of **contemplative considerations** can lead to **inefficiencies** and uncertainties.
    - For example, the **Protection of Children from Sexual Offenses Act, 2012**, has been criticized for its application to **consensual sexual activities between minors**, raising concerns about criminalising such conduct.
    - **Supreme Court (SC)** in the case of **P. Mohanraj versus M/s Shah Brothers Ispat Ltd., 2021** referred to **Section 138 of the Negotiable Instruments Act (NI Act), 1881** as a 'civil sheep' in a 'criminal wolf's' clothing.
      - **Section 138 of the NI Act** provides for criminal provision regarding a **cheque bounced due to insufficiency of funds**.
- **Undermining of Due Process:**
  - SLLs have led to the **sabotage of due process values**, exemplified by increased powers of search and seizure and admissibility of confessions recorded by police officers.

Note:



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- It does not adequately **safeguard the rights of the accused**, creating concerns about fairness and the protection of individual liberties.
- The lack of robust safeguards can open the door to potential abuse of the legal process, affecting the accused's rights
- Restrictive Bail Provisions in SLLs make obtaining bail nearly impossible infringing on the rights of the accused.
  - **E.g:** Under **Section 43(D)(5) of the UAPA**, the bail provisions are exceptionally stringent, making it nearly impossible for those accused under the UAPA to secure bail.

## SC Asks States to Appoint Officers under POSH Act, 2013

### Why in News?

Recently, the **Supreme Court of India (SC)** has directed **Ministry of Women and Child Development (MoWCD)** of all states/UTs to **appoint district officers** under the **Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act)** to ensure the effective implementation of the law.

### What are the Supreme Court's Directives to States?

- **Need for SC's Direction:**
  - The Supreme Court realised that women found protection under a law against sexual harassment in workplaces **beyond their reach** for the simple reason that there was no one to go to with their complaints.
  - The court found that **many states had not bothered to notify District Officers under the POSH Act** all these years. Therefore, it directed all states to immediately appoint district officers under the POSH Act.
- **Role of District Officers Under the POSH Act:**
  - The POSH Act mandates states to appoint an officer in every district who would play a **"pivotal" role in the implementation of the Act**.
  - The District Officer would constitute **Local Complaints Committees (LCCs)** to receive complaints from women employed in small establishments

with less than 10 workers or cases in which the assailant is the employer himself.

- A District Officer's responsibilities also included appointing nodal officers under the Act in rural, tribal and urban areas.
- **Appointment of Nodal Persons:**
  - SC directed that the **MoWCD of every State/UT** through its Principal Secretary, should consider identifying a **'nodal person' within the Department**, to oversee and aid in coordination as contemplated under the POSH Act.
    - This person would also be able to coordinate with the Union Government on matters relating to this Act and its implementation.
- **Deadline of Report Submission:**
  - Further, each State/UT Government is to submit a consolidated report of its compliance with the below directions to the Union Government within 8 weeks.

### What is the PoSH Act, 2013?

- **About:**
  - The POSH Act is a legislation **enacted by the Government of India in 2013** to address the issue of sexual harassment faced by women in the workplace.
    - The Act aims to create a safe and conducive work environment for women and provide protection against sexual harassment.
  - The PoSH Act **defines sexual harassment to include unwelcome acts such as physical contact and sexual advances, a demand or request for sexual favours, making sexually coloured remarks, showing pornography, and any other unwelcome physical, verbal, or non-verbal conduct of a sexual nature.**
- **Background:**
  - The Supreme Court in a landmark judgment in the **Vishakha and others v State of Rajasthan 1997** case gave **'Vishakha guidelines'**.
  - These guidelines **formed the basis for the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013**.
  - The SC also drew its strength from several provisions of the **Constitution including Article 15** (against discrimination on grounds only of religion, race, caste, sex, and place of birth), also drawing from

Note:



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relevant International Conventions and norms such as the General Recommendations of the **Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)**, which India ratified in 1993.

➤ **Key Provisions:**

- **Prevention and Prohibition:** The Act places a legal obligation on employers to prevent and prohibit sexual harassment in the workplace.
- **Internal Complaints Committee (ICC):** Employers are required to constitute an **ICC** at each workplace with **10 or more employees** to receive and address complaints of sexual harassment.
  - The Complaints Committees have the powers of civil courts for gathering evidence.
- **Duties of Employers:** Employers must undertake awareness programs, provide a safe working environment, and display information about the POSH Act at the workplace.
- **Penalties:** Non-compliance with the Act's provisions can result in penalties, including fines and cancellation of business licenses.

## Anti-Defection Law

### Why in News?

Recently, the **Supreme Court (SC)** has rebuked the Speaker of the Maharashtra Assembly for prolonging **Anti-Defection** proceedings against the Chief Minister and other MLAs.

- The court expressed dissatisfaction with the **lack of progress in the disqualification proceedings** and urged the Speaker to make a decision within two months.
- Previously, the court had directed the speaker to prepare a timeline for completing the disqualification proceedings under the **Tenth Schedule of the Constitution**.

### What is the Background?

- In 2022, the Uddhav Thackeray-led government was **toppled and replaced by another government**, comprising a faction of the Shiv Sena. The leader of the breakaway Sena faction, Eknath Shinde, **became the new Chief Minister** of Maharashtra.
- Thereafter, petitions were filed by the Thackeray group challenging the then-Maharashtra Governor's **decision to call for a trust vote before his resignation**.

- Disqualification, if imposed, would affect not only the Shiv Sena MLAs but also Shinde's **position as Chief Minister**.

### What is an Anti-Defection Law?

➤ **About:**

- The anti-defection law punishes **individual Members of Parliament (MPs)/Members of the Legislative Assembly (MLAs)** for leaving one party for another.
- Parliament added it to the Constitution as the **Tenth Schedule** in 1985 in order to bring **stability to governments by discouraging legislators** from changing parties.
  - The Tenth Schedule - popularly known as the **Anti-Defection Act** - was included in the Constitution via the 52<sup>nd</sup> Amendment Act, 1985.
- It sets the provisions for the **disqualification of elected members** on the grounds of defection to another political party.
  - It was a response to the toppling of multiple state governments by party-hopping MLAs after the general elections of 1967.

➤ **Does not Penalise Group MP/MLAs:**

- However, it allows a group of MP/MLAs to join (i.e., merge with) another political party without inviting the penalty for defection. And it does not penalise political parties for encouraging or accepting defecting legislators.
  - As per the **1985 Act**, a '**defection**' by **one-third of the elected members** of a political party was considered a 'merger'.
  - But the **91<sup>st</sup> Constitutional Amendment Act, 2003**, changed this and **now at least two-thirds of the members of a party must be in favour of a "merger"** for it to have validity in the eyes of the law.
- The members disqualified under the law can **stand for elections from any political party for a seat in the same House**.
- The decision on questions as to disqualification on ground of defection are referred to the **Chairman or the Speaker of such House**, which is subject to '**Judicial review**'.
  - However, the law does not provide a timeframe within which the presiding officer has to decide a defection case.

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### ➤ Grounds for Defection:

- **Voluntary Give Up:** If an elected member voluntarily gives up his membership of a political party.
- **Violation of Instructions:** If he votes or abstains from voting in such House contrary to any direction issued by his political party or anyone authorized to do so, without obtaining prior permission.
- **Elected Member:** If any independently elected member joins any political party.
- **Nominated Member:** If any nominated member joins any political party after the expiry of six months.

### **How Does Defection**

#### **Affect the Political System?**

### ➤ Subversion of Electoral Mandates:

- Defection is the **subversion of electoral mandates** by legislators who get elected on the ticket of one party but then find it convenient to shift to another, due to the lure of ministerial berths or financial gains.

### ➤ Affects the Normal Functioning of Government:

- The infamous **"Aaya Ram, Gaya Ram"** slogan was coined against the background of continuous defections by the **legislators in the 1960s**.
- The defection leads to instability in the government and affects the administration.

### ➤ Promote Horse Trading:

- Defection also promotes horse-trading of **legislators which clearly goes against** the mandate of a democratic setup.

### **What are the**

#### **Challenges with Anti-Defection Law?**

### ➤ Paragraph 4 of the law:

- Paragraph 4 of the Anti-Defection Law says that **if a political party merges with another party, its members will not lose their seats.**
  - But this merger must have the **support of at least two-thirds of the members** of that party in the House. **The law does not say if the merger is based on the national or regional level of the party.**

### ➤ Undermining Representative & Parliamentary Democracy:

- After enactment of the law, the **MP or MLA has to follow the party's direction blindly** and has no freedom to vote in their judgment.

- Due to the Anti-Defection law, the chain of **accountability has been broken** by making legislators accountable primarily to the political party.

### ➤ Controversial Role of Speaker:

- There is no clarity in the **law about the timeframe for the action of the House Chairperson or Speaker** in the anti-defection cases.
- Some cases take six months and some even three years. There are cases that are disposed of after the term is over.

### ➤ No Recognition of Split:

- Due to the **91<sup>st</sup> Constitutional Amendment Act, 2003**, the anti-defection law created an exception for anti-defection rulings.
  - However, the amendment does not recognize a 'split' in a legislature party and instead recognizes a 'merger'.

### ➤ Only Allows Wholesale Defection:

- It allows **wholesale defection**, but retail defection is not allowed. Amendments are required to plug the loopholes.
- He raised **concern that if a politician is leaving a party, s/he may do so, but they should not be given a post in the new party.**

### ➤ Affects the debate and discussion:

- The Anti-Defection Law has **created a democracy of parties** and numbers in India, **rather than a democracy of debate and discussion.**
  - In this way, it does **not make a differentiation between dissent and defection** and weaken the Parliamentary deliberations on any law.

## **Contempt of Court**

### **Why in News?**

Recently, the **Supreme Court (SC)** has started **Contempt of Court** Proceedings against **two members of the NCLAT (National Company Law Appellate Tribunal).**

- The court has issued show cause notices to the members for pronouncing a judgment in the **Finolex Cables case** despite directions from the SC to maintain the status quo in it.

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**Note:** A Show Cause Notice is a **formal communication issued by a court, government agency, or another authoritative body** to an individual or entity, asking them to explain or justify their actions, **decisions, or behavior**. The purpose of a show cause notice is to give the recipient an **opportunity to provide a response or clarification regarding specific concerns** or alleged violations.

### What is the Case About?

- The SC had earlier directed the scrutinizer to declare the result of the **Annual General Meeting** of the **Finolex Cables** and asked NCLAT to pronounce its judgment after **being informed of the result**.
- However, NCLAT reportedly declared the judgment **without acknowledging the SC's directive**.
- The **Chief Justice of India (CJI)** expressed concerns about the functioning of National Company Law Tribunal (NCLT) and NCLAT. He noted that these **tribunals appear to have issues, and this case is an example of those issues**.
- The SC expressed its displeasure with the NCLAT's handling of the case and stated that the NCLAT **should have abided by the SC's orders**.

### What is Contempt of Court?

- **About:**
  - Contempt of court seeks to protect judicial institutions from **motivated attacks and unwarranted criticism**, and as a legal mechanism to punish those who lower its authority.
- **Statutory Basis:**
  - When the Constitution was adopted, contempt of court was made one of the restrictions on freedom of speech and expression under **Article 19 (2) of the Constitution of India**.
  - Separately, **Article 129 of the Constitution** conferred on the Supreme Court the power to punish **contempt of itself**. Article 215 conferred a corresponding power on the High Courts.
  - The **Contempt of Courts Act, 1971**, gives statutory backing to the idea.
- **Kinds of Contempt of Court:**
  - **Civil Contempt:** It is the **wilful disobedience** to any judgment, decree, direction, order, writ or other process of a court or wilful breach of an undertaking given to a court.

- **Criminal Contempt:** It is the publication of any matter or the doing of any other act which **scandalises or lowers the authority of any court**, or interferes with the due course of any judicial proceeding, or obstructs the administration of justice in any other manner.

**Note:** Fair and accurate reporting of **judicial proceedings** will **not amount to contempt** of court. Nor is any **fair criticism on the merits of a judicial order** after a case is heard and disposed of.

### ➤ Punishment:

- The Contempt of Court Act of 1971 punishes the guilty with imprisonment that may extend to **six months or fine of Rs 2,000 or both**.
  - It was amended in 2006 to include **"truth and good faith" as a defence**.
  - It was added that the court may impose punishments only if the act of the other person substantially interferes, or tends to interfere with the due course of justice.

### What is the Criticism of Contempt of Court Proceedings?

- It is criticized to be **reminiscent of British colonialism in India** as the contempt laws have been **abolished from the United Kingdom itself**.
- Demands have been raised to restrict contempt to **only "wilful disobedience"** of directions/judgments of the court and **remove "scandalizing the court"**.
- It is also said that it **may lead to judicial overreach**.
- There are high numbers of contempt cases pending in various High Courts and the Supreme Courts, which **delays the justice administration** by an already overburdened judiciary.

## Amendment to Aircraft Rules, 1937

### Why in News?

Recently, the Ministry of Civil Aviation has notified the Amendments to the Aircraft Rules, 1937, aiming to promote Safety and Ease of Doing Business in Aviation Regulation.

- These amendments align India's aviation regulations with the **International Civil Aviation Organization's (ICAO) Standards and Recommended Practices (SARPs)** and international best practices.

Note:

### What are the Key Amendments to the Aircraft Rules, 1937?

- **Extension of License Validity:**
  - The amendment extended the validity of **Airline Transport Pilot License (ATPL)** and Commercial Pilot License (CPL) holders' licenses from **five years to ten years**.
  - This change is **expected to streamline the licensing process** and reduce administrative burdens on pilots and aviation authorities like the **Directorate General of Civil Aviation (DGCA)**.
- **Enhanced Control Over False Lights:**
  - The revision clarified the **definition of "light" to include various sources** and extended the government's jurisdiction from **5 kilometers to 5 nautical miles around an aerodrome**.
  - It empowered the government to take action **against individuals displaying lights disrupting aircraft operation**, and in case of unattended lights, the government can intervene and report the matter to the relevant authorities for legal action under the **Indian Penal Code (IPC)**.
- **Removal of Redundant Rule:**
  - Rule 118, pertaining to the validation of foreign licenses, was removed to align regulations with the **evolving needs of the aviation sector**.
- **Liberalized Requirements for Air Traffic Controller License:**
  - The amendment introduced **flexibility in recency and competency requirements** for Air Traffic Controller License holders, allowing for simulated exercises, emergencies, and skill assessments.
  - This ensures **continued competence**, particularly during limited movements or watch hours.

### What are the Significance of these Amendment Rules?

- The amendments can play a crucial role in **enhancing aviation safety by addressing concerns** related to the display of "false lights" around aerodromes.
- The extended jurisdiction and clarified definitions ensure a **safer operational environment**, reducing potential hazards and disruptions to aircraft operations.
- The streamlined licensing process and the removal of redundant rules can contribute to a **more business-friendly environment**, attracting investment and fostering growth in the aviation industry.

### What is the ICAO?

- It is a specialized agency of the **United Nations** that was created in 1944 to promote safe, secure, and efficient air transportation around the world.
- ICAO develops **international standards and recommended practices** for aviation, including regulations for air navigation, communication, and airport operations.
- It also works to address global aviation issues, such as air traffic management, aviation security, and environmental protection.
- It is headquartered in **Montreal, Canada**.

## IndiaSkills 2023-24

### Why in News?

Recently, the Ministry of Skill Development and Entrepreneurship has launched **IndiaSkills 2023-24** and commended the **World Skills Competition (WSC) 2022 winners**.

### What is IndiaSkills 2023-24?

- **About:**
  - IndiaSkills 2023-24 is a **skill development competition** which aims to **foster and enhance the skills of individuals** in various domains, preparing them for national and international skill competitions.
  - IndiaSkills is the **precursor to the WorldSkills competition**. Participants who will excel in IndiaSkills at the national level will take part in the global event WorldSkills.
- **Objectives:**
  - **Promotion of Employable Skills:** The program underlines the importance of developing employable skills that **align with market needs**, increasing the acceptance of the workforce within the industry.
  - **Addressing Skill Gaps:** It aims to **identify and bridge skill gaps by emphasizing the mapping of skills** needed in the industry, reducing the disparity between degrees earned and practical skills acquired.
  - **Integration of Competencies and Knowledge:** Equal emphasis is placed on competencies, applied knowledge, and **hands-on training to prepare individuals to lead effectively in the 21st century**.

Note:



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### What is the World Skills Competition?

- **About:**
  - The WorldSkills Competition, organized by WorldSkills International is held biennially and involves 86 member countries.
  - These competitions serve as a **benchmark for high performance and offer an objective means to evaluate vocational excellence.**
- **India's Performance in WSC 2022:**
  - India participated in **50 skills** and secured its best-ever ranking, **11<sup>th</sup> position, with 2 Silver Medals, 3 Bronze Medals, and 13 Medallions** for Excellence.
  - The participation included a **diverse range of skills** such as hotel receptionist, mechatronics, Mobile Robotics, Water Technology, bakery, web technologies, and more.
    - Indian competitors were selected through the **IndiaSkills Competition 2021** and were trained under WorldSkills India Experts and trainers.

#### What are the Government Initiatives for Skill Development?

- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)**
- **Sector Skill Councils (SSC)**
- **National Skills Qualifications Framework (NSQF)**
- **Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP)**

## Electoral Bonds

### Why in News?

Recently, the **Supreme Court (SC)** has referred petitions challenging the **2018 Electoral Bonds Scheme** to a five-judge Constitution Bench.

- While the Centre has termed the scheme “a big step towards electoral reform” which “will ensure transparency” and “accountability”, petitioners have contended that it affects transparency in political funding.

**Note:** The court has agreed to focus primarily on two critical issues related to the **electoral bonds scheme:**

- The **legality of anonymous donations** to political parties and the **infringement of citizens' right to information** about political party funding, potentially promoting corruption.

- These issues relate to the violation of constitutional **Articles 19, 14, and 21.**

### What are Electoral Bonds?

- **About:**
  - The electoral bonds system was **introduced in 2017** by way of a Finance bill and it was implemented in 2018.
  - They serve as a means for individuals and entities to make donations to registered political parties while maintaining donor anonymity.
- **Features:**
  - **State Bank of India (SBI)** issues the bonds in denominations of Rs 1,000, Rs 10,000, Rs 1 lakh, Rs 10 lakh, and Rs 1 crore.
  - Payable to the bearer on demand and interest-free.
  - Purchased by Indian citizens or entities established in India.
  - Can be bought individually or jointly with other individuals.
  - Valid for 15 calendar days from the date of issue.
- **Authorized Issuer:**
  - SBI is the authorized issuer.
  - Electoral Bonds are issued through designated SBI branches.
- **Eligibility of Political Parties:**
  - Only the political parties registered under Section 29A of the **Representation of the People Act, 1951** and have secured not less than 1% of the votes polled in the last general election to the **House of the People** or the Legislative Assembly, are eligible to receive electoral bonds.
- **Purchase and Encashment:**
  - Electoral Bonds can be purchased digitally or through cheques.
  - Encashment only through an authorized bank account of the political party.
- **Transparency and Accountability:**
  - Parties must disclose their bank **account with the Election Commission of India (ECI).**
  - Donations are made through banking **channels, ensuring transparency.**
  - Political parties are obligated to explain the utilization of the funds received.

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➤ **Benefits:**

- Enhanced transparency in political party funding.
- Accountability in disclosing donation utilization.
- Discouragement of cash transactions.
- Preservation of donor anonymity.

**What are the Concerns Related to the Electoral Bond Scheme?**

➤ **Contradicting its Basic Idea:**

- The central criticism of the electoral bonds scheme is that it does the exact opposite of what it was meant to do i.e. to **bring transparency to election** funding.
  - For example, critics argue that the anonymity of electoral bonds is only for the broader public and opposition parties.

➤ **Possibility of Extortion:**

- The fact that such bonds are sold via a government-owned bank (SBI) leaves the door open for the government to know exactly who is funding its opponents.
  - This, in turn, **allows the possibility for the government of the day** to either **extort money**, especially from the big companies, or victimise them for not funding the ruling party — either way providing an unfair advantage to the party in power.

➤ **A Blow to Democracy:**

- Through an **amendment to the Finance Act 2017**, the Union government has exempted political parties from disclosing donations received through electoral bonds.
  - This means the voters will not know which individual, company, or organization has funded which party, and to what extent.
- However, in a **representative democracy**, citizens cast their votes for the people who will represent them in Parliament.

➤ **Favoritism towards Rich Corporates:**

- The Electoral Bonds Scheme has **opened the floodgates to unlimited corporate donations to political parties** and anonymous financing by Indian as well as foreign companies which can have **serious repercussions on the Indian democracy**.

- Donations made under this scheme by corporate and even **foreign entities enjoyed a 100% tax exemption**, benefiting wealthy corporations.

➤ **Compromising Right to Know:**

- **The Indian Supreme Court** has long held that the **“right to know”**, especially in the context of elections, is an integral part of the **right to freedom of expression (Article 19)** under the **Indian Constitution**.
  - The Centre had made multiple amendments by way of two **Finance Acts— Finance Act, 2017 and Finance Act, 2016**, both passed as money bills.
    - The petitioners challenged the amendments as being “unconstitutional”, **“violative of doctrines of separation of powers”** and **violative of an array of fundamental rights**.

➤ **Against Free & Fair Elections:**

- Electoral bonds provide no details to the citizens.
- The said anonymity does not apply to the government of the day, which can always access the donor details by demanding the data from the State Bank of India (SBI).
- This implies that the government in power can leverage this information and **disrupt free and fair elections**.

➤ **Crony Capitalism:**

- The electoral bonds scheme removes all pre-existing limits on political donations and effectively allows well-resourced corporations to fund elections subsequently paving the way for crony capitalism.
- Crony Capitalism: An economic system characterized by close, mutually advantageous relationships between business leaders and government officials

## **SC to Hear Challenge on Designation of Bills as Money Bills**

### **Why in News?**

A seven-judge Bench of the **Supreme Court of India**, led by the **Chief Justice of India**, addresses a request for priority to a reference concerning the manner in which the Centre got crucial amendments passed in the Parliament as **Money Bills**.

Note:



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## What are the Challenged Amendments Passed as Money Bills?

### ➤ Prevention of Money Laundering Act (PMLA) Amendments:

- Amendments made from 2015 onwards to the **Prevention of Money Laundering Act (PMLA)** granted the **Enforcement Directorate** extensive powers, including the authority to make arrests and conduct raids.
- The primary concern is the passage of these **amendments as Money Bills**, raising questions about their legality and constitutionality.

- Legal experts and petitioners question whether these significant changes should have followed the standard legislative process involving both houses of Parliament.

### ➤ Finance Act of 2017:

- The **Finance Act of 2017** was categorized and passed as a Money Bill, raising concerns about the proper use of this legislative procedure.
- Allegations that the Act aimed to alter appointments to 19 key judicial tribunals, including the **National Green Tribunal** and **Central Administrative Tribunal**.

# TYPES OF BILLS

## Ordinary Bills

- Concerned with any matter other than financial subjects

## Money Bills

- Concerned with financial matters like:
  - Taxation
  - Public expenditure
  - Regulation of borrowing of money by Union govt
  - Consolidated and Contingency Funds of India

## Financial Bills

- Concerned with financial matters but different from money bills:
  - **FB (I)** - e.g. - a bill that contains a borrowing clause but does not exclusively deal with borrowing
  - **FB (II)** - Provisions involving expenditure from Consolidated Fund of India, but excluding matters mentioned Money bill

## Constitution Amendment Bills

- Concerned with amending the provisions of Constitution

### TYPES OF BILLS

Features	Ordinary	Money	Financial (I)	Financial (II)	Const. Amendment
Article	107, 108	110	117 (1)	117 (3)	368
Introduced in	Both LS & RS	Only LS	Only LS	Both LS & RS	Both LS & RS (but not state legislature)
Introduced by	Minister or pvt member	Only minister	Minister or pvt member	Minister or pvt member	Minister or pvt member
Recommendation of President (introduction)	Not required	Required	Required	Only req. for consideration	Not required
Amendment/rejection by RS	Can do	Can only recommend (not binding)	Can do	Can do	Can do
Joint Sitting for deadlock	Summoned by President	No provision	Summoned by President	Summoned by President	No provision
President's Role	Reject/ approve/ return for reconsideration	Reject or approve but no return	Reject/approve/ return	Reject/ approve/ return	Must approve (can't reject/ return)

Note:

- Accusations that categorizing the 2017 Act as a Money Bill was a deliberate attempt to extend executive control over these tribunals.
- The Act's passage was accompanied by changes that substantially downgraded the qualifications and experience required to staff these key judicial bodies.
- **Aadhaar Act, 2016:**
  - The Supreme Court in 2018, had ruled in favor of the government and had cleared the **Aadhaar Act as a valid money bill** under Article 110 of the Constitution.
  - The government had argued that since the subsidies distributed through Aadhaar flows from the **Consolidated Fund of India**, the law is validly categorized as a Money Bill. which raised legal and procedural questions.
    - Money Bills are **exclusive to the Lok Sabha and limit the Rajya Sabha's influence**.
  - Recently, the CJI, asked for a more comprehensive review.

### ***What will be the Implications of the Larger Bench?***

- Clarity on the constitutionality of the PMLA, Aadhaar Act, and Tribunal reforms.
  - Determination of whether these laws were rightly categorized as money bills or used to circumvent Rajya Sabha scrutiny.
- Resolution of whether these classifications were legally sound or strategic manoeuvres to avoid oversight.
- The discussions within the larger bench might offer additional insights into the level of scrutiny that the **judiciary can exercise over the Speaker's determinations in classifying bills as money bills**.

## **Cabinet Approves Royalty Rates for Mining**

### ***Why in News?***

Recently, the Union Cabinet has approved amendment of **2<sup>nd</sup> Schedule** of the **Mines and Minerals (Development and Regulation) Act, 1957 ('MMDR Act')** for specifying rate of royalty in respect of 3 **Critical and Strategic minerals**, namely, **Lithium, Niobium and Rare Earth Elements (REEs)**.

- This will enable the **Central Government** to auction blocks for **Lithium, Niobium and REEs** for the first time in the country.

**Note:** The **Mines and Minerals (Development and Regulation) Amendment act, 2023** was passed by the Parliament, which came into force from August, 2023.

- The Amendment delisted six minerals, including **Lithium and Niobium**, from the list of atomic minerals, thereby **allowing grant of concessions for these minerals** to the private sector through auction.

### ***What are Royalty Rates?***

- **About:**
  - Mineral royalty is the **payment that the government (the sovereign owner) receives** for allowing the extraction of mineral resources.
  - A report by the **Centre for Social and Economic Progress (CSEP)** states that India has some of the highest mineral royalty rates in the world, which affects the competitiveness of its mining sector.
- **Key Amendments:**
  - The **2<sup>nd</sup> Schedule** of the **MMDR Act** provides royalty rates for various minerals. The amendment significantly lowers the royalty rates for these minerals.
  - For instance, Lithium mining will attract a **royalty of 3% based on the London Metal Exchange price**.
    - Niobium too, will be subject to 3% royalty calculated on the ASP, in case of both primary and secondary sources.
    - REEs will have a royalty of **1% based on the ASP (Average Sale Price) of the Rare Earth Oxide** (the ore in which the REE is most commonly found).
  - The Ministry of Mines has laid down the way to calculate the ASP of these minerals, on the basis of **which the bid parameters will be determined**.
  - Domestic mining is sought to be encouraged with the aim of lowering imports, and setting up related end-use industries such as **Electric Vehicles (EVs)** and energy storage solutions.

### ***What is the Significance of the Move?***

- **Private Sector Participation:**
  - The amendment paves the way for the participation of the private sector through **auctioning concessions** for these minerals, as the government removed them from the list of **'specified' atomic minerals**.

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- **Global Benchmarking and Commercial Exploitation:**
  - By specifying new royalty rates aligned with global benchmarks, the **government is encouraging commercial exploitation** of these minerals through **competitive auctions**, either conducted by the central government or states.
- **Boosting Domestic Mining and Industries:**
  - The move aims to **encourage domestic mining to reduce imports** and promote the establishment of end-use industries like electric vehicles and energy storage solutions.
- **Commitment to Net-Zero Emissions:**
  - The critical minerals targeted in this amendment are **viewed as essential for India's energy transition** and its commitment to achieving **Net-Zero Emissions** by 2070.
- **Strategic Push Against China:**
  - The effort to enter the **lithium value chain is part of India's strategic push** to reduce dependence on China, a major source of lithium-ion energy storage products.

#### What are the Key Points Related to Lithium, REEs, Niobium?

- **Lithium:**
  - Lithium is a **vital ingredient for rechargeable lithium-ion batteries** used in electric vehicles, laptops, and mobile phones. India, currently reliant on imports for lithium, has made exploration efforts in regions like Jammu & Kashmir, Rajasthan, Gujarat, Odisha, and Chhattisgarh to extract lithium.
- **Rare Earth Elements (REEs):**
  - REEs are crucial for permanent magnet motors used in electric vehicles. They are primarily sourced from or processed in China, presenting a supply chain challenge.
  - REEs mining can have environmental implications, and India's efforts aim to secure a supply of **REEs while considering environmental sustainability**.
- **Niobium:**
  - Niobium is used to **enhance the strength of alloys**, making them particularly useful in various applications such as jet engines, buildings, oil and gas pipelines, magnets for MRI scanners, etc.
  - Niobium is a silvery metal that is **very resistant to corrosion** due to a layer of oxide on its surface.

#### What is the Scenario of the Mining Sector in India?

- **Backbone of Manufacturing:**
  - Mining industry plays a **crucial role in the country's economy**, serving as the backbone for manufacturing and infrastructure sectors.
  - Mining and quarrying sector contributes **around 2.5% of the Gross Domestic Product (GDP)**.
- **Scope:**
  - India ranks **4<sup>th</sup> globally** in terms of iron ore production and is the world's 2nd largest coal producer as of 2021.
    - Combined Aluminum production (primary and secondary) in India stood at 4.1 MT per annum in FY21 becoming the **2nd largest in the world**.
  - As per World Mineral Production, 2016-20, British Geological Survey, **India's ranking in 2020 in world production in term of quantity**.

Mineral/Resource	Production Rank in 2020
Coal & Lignite	2 <sup>nd</sup>
Steel (Crude/Liquid)	2 <sup>nd</sup>
Zinc (Slabs)	3 <sup>rd</sup>
Aluminium (Primary)	3 <sup>rd</sup>
Chromite Ores & Concentrate	4 <sup>th</sup>
Iron Ore	4 <sup>th</sup>
Graphite	4 <sup>th</sup>
Manganese Ore	5 <sup>th</sup>
Bauxite	6 <sup>th</sup>
Copper (Refined)	7 <sup>th</sup>

#### Information Commissions in India

##### Why in News?

Recently, **Satark Nagrik Sangathan (SNS)** has released a 'Report Card on the Performance of **Information Commissions** in India, 2022-23' under **Right to Information (RTI) Act, 2005** which shows that **Maharashtra has been the worst performing state in RTI responsiveness**, with 1,15,524 pending appeals.

Note:

- SNS is a non-governmental organization (NGO) in India dedicated to promoting transparency, accountability which works to empower citizens to become vigilant and informed participants in democracy.

### **What are the Key Highlights of the Report Card?**

- **Other Poor Performers:**
  - The second maximum number of pending appeals was in **Karnataka (41,047)** while Tamil Nadu declined to provide the information regarding total pending appeals at its Information Commission which was the worst performing in 2022.
- **Overall Status in 2023:**
  - A total of **3,21,537 appeals and complaints are pending in 27 State Information Commissions** across the country, and the backlog has been steadily increasing.
- **Previous Years' Status:**
  - The 2019 assessment had found that a total of 2,18,347 appeals/complaints were pending in the 26 Information Commissions from which data was obtained, which climbed to 2,86,325 in 2021 and then crossed three lakh as in 2022.
- **Defunct Information Commissions:**
  - Four Information Commissions — **Jharkhand, Telangana, Mizoram and Tripura** — are defunct as no new Information Commissioners were appointed upon incumbents demitting office.
  - **Six Information Commissions are currently headless** — the Central Information Commission, and the State Information Commissions of Manipur, Chhattisgarh, Maharashtra, Bihar, and Punjab.
- **Disposal Rate:**
  - The assessment shows that **West Bengal State Information Commission (SIC)** would take an estimated 24 years and one month to dispose of a matter as per the current standards and is the worst performing in disposal rate.
  - In Chhattisgarh and Maharashtra, the estimated time taken by SICs for disposing of an appeal or complaint is over four years. **The assessment shows that 10 Information Commissions will**

take one year or more to dispose of an appeal/complaint.

### **What is the Central and State Information Commission?**

- **Central Information Commission (CIC):**
  - **Established:** The CIC was established by the Central Government in 2005, under the provisions of the **Right to Information Act (2005)**. It is not a **constitutional body**.
  - **Members:** The Commission consists of a **Chief Information Commissioner and not more than ten Information Commissioners**.
  - **Appointment:** They are appointed by the **President** on the recommendation of a committee consisting of the Prime Minister as Chairperson, the Leader of Opposition in the **Lok Sabha** and a Union Cabinet Minister nominated by the Prime Minister.
  - **Tenure:** The Chief Information Commissioner and an Information Commissioner **shall hold office for such term as prescribed by the Central Government or until they attain the age of 65 years, whichever is earlier**. They are **not eligible for reappointment (as per the amendments made in RTI Act, 2005 in 2019)**.
  - **Power and Functions of CIC:**
    - It is the duty of the Commission to receive and inquire into a complaint from any person regarding information requested under RTI, 2005.
    - The Commission can order an inquiry into any matter if there are reasonable grounds (**suo-moto power**).
    - While inquiring, the Commission has the **powers of a civil court** in respect of summoning, requiring documents etc.
- **State Information Commission:**
  - It is constituted by the **State Government**.
  - It has **one State Chief Information Commissioner (SCIC) and not more than 10 State Information Commissioners (SIC)** to be appointed by the **Governor** on the recommendation of the **Appointments Committee headed by the Chief Minister**.

Note:



**Right to Information Act**

- Genesis of RTI law started in 1986, **through judgement of Supreme Court in Mr. Kulwal v/s Jaipur Municipal Corporation case**, in which it directed that freedom of speech and expression provided under **Article 19 of the Constitution** clearly implies Right to Information, as without information the freedom of speech and expression cannot be fully used by the citizens
- It has been implemented in order to see that the Indian citizens are enabled to exercise their rights to ask some pertinent questions to the Government and different public utility service providers in a practical way.
- The RTI Act **replaced the Freedom of Information Act 2002**.
- The objective of this act was to help the citizens avail of quicker services from the government agencies since the act enables them to ask questions like why a particular application or an official proceeding gets delayed.
- Mainly the act aims at achieving a corruption-free India.
- The Act, 2005 was **amended in 2019 to bring about changes with respect to the tenure and service conditions** of CIC and ICs at both central and state levels.
- Recently, section 44 (3) of the **Digital Personal Data Protection Act 2023** modified **Section 8 (1)(j) of the RTI Act**, creating an **exemption for all personal information** from disclosure and removing the previously established exceptions that permitted the release of such information.

**Information That can be Sought**

- **Any Indian citizen is free to seek answers** from a Government Authority like applying for a delayed IT refund, driving license or passport, or details of a repair or infrastructure project completed or going on.
- Information sought can also be related to the funds allotted under the different kinds of relief funds in the country.
- The act **enables students to get copies of answer sheets from the universities** under this act.

Note:

# Economic Scenario

## Highlights

- Complex Landscape of E-Commerce
- Rashtriya Gokul Mission
- Goan Cashew Gets GI Tag
- Vizhinjam International Seaport Project
- Bidenomics
- India-Japan Chip Supply Chain Partnership
- India's Food Export Rejections in the United States
- Global Tax Evasion Report 2024
- India's Position in Global Economic Growth
- Supreme Court's Ruling Imposes Capital Taxation on Telecoms
- China To Curb Exports Of Graphite Material
- Proposed Reforms For Multilateral Development Banks
- Blueprint for Transforming the Blue Economy
- Minimum Support Price
- Crop Switching for Sustainable Agriculture
- Fostering Sustainable Agrifood System
- CBDT Directives on Angel Tax
- Foreign Contribution Regulation Act

## Complex Landscape of E-Commerce

### Why in News?

In a recent meeting at the **World Trade Organization (WTO)** in Geneva, **India raised concerns about the lack of a clear definition for e-commerce** trade in goods and services.

- The absence of a **precise delineation** has led to **contrasting views between developed and developing member countries**, particularly regarding the imposition of customs duties.

### What are the Primary Points of Dispute Concerning E-commerce?

- **Interpretational Divergence in E-commerce: Goods vs. Services**
  - **Developed and developing nations** differ in their interpretation of e-commerce, particularly in the context of goods and services.
    - This challenge is exemplified in the case of streaming services like **Netflix, where content (a product) is delivered via a service membership.**
  - This variance complicates the establishment of clear policies within the WTO framework.
- **Uncertainties Surrounding Customs Duties:**
  - **WTO members** have **been extending the Moratorium** regarding imposition of customs

duties on **electronic transmissions** since 1998. And, the last extension came during the **12<sup>th</sup> ministerial conference.**

- But the **absence of a defined framework for e-commerce** trade in services **creates uncertainties**, raising concerns about maintaining a level playing field.
- India emphasizes the necessity of a **clear definition, particularly highlighting the need for differentiation between digital goods and services** due to existing customs duties on goods but not on services.

**Note:** Developed nations advocate for a **duty-free environment**, whereas developing countries seek policy space to **impose duties**, aiming to safeguard domestic industries and **support MSME (Micro, Small, and Medium Enterprises) growth.**

### ➤ Cryptocurrencies: E-commerce Disruption:

- The **Global Trade Research Initiative (GTRI)** highlighted that the **growth of cryptocurrencies** poses a challenge to the current WTO e-commerce framework, prompting an immediate need for discussions on classifying them as electronic transmissions.

### What is E-Commerce?

#### ➤ About:

- The **World Trade Organization** defines e-commerce as the **electronic production, distribution, sale, or delivery of goods and services.**

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- This includes products like **books, music, and videos transmitted digitally.**
- **Benefits Provided by E-commerce:**
  - **Convenience and Accessibility:** Customers can shop **anytime, anywhere**, providing unparalleled convenience and accessibility to products and services.
  - **Data-driven Insights:** Access to consumer data provides valuable insights for businesses to **understand customer behavior, preferences, and trends**, allowing for targeted marketing and improved customer experiences.
  - **Diverse Product Offerings:** E-commerce platforms offer a **wide array of products and services in one place**, allowing customers to easily **compare and choose** from a diverse range of options.
  - **Convenient Payment Options:** Multiple payment gateways and options available, providing **ease and security in transactions** for both businesses and customers.
  - **24/7 Accessibility:** Unlike physical stores, **e-commerce platforms are operational 24/7**, providing constant access to products and services for customers worldwide.
  - **Global Reach:** Allows businesses to reach a global market without the **constraints of physical locations**, enabling access to a broader customer base.

#### What are the Indian Government Initiatives Related to E-Commerce?

- **Unified Payment Interface (UPI)**
- **Government e-Marketplace**
- **BharatNet project**
- **Open Network for Digital Commerce (ONDC)<sup>1</sup>**
- **National E-Commerce Policy**
- **Consumer Protection (E-Commerce) Rules, 2020**

## Rashtriya Gokul Mission

### Why in News?

With almost a decade into **Rashtriya Gokul Mission**, it is found that instead of improving the quality of all the indigenous breeds, as envisioned under the scheme, it has ended up promoting only one indigenous variety, the **Gir cow**, across the country.

### What is the Issue

#### With Rashtriya Gokul Mission?

- **Prominence of Gir Cow in Rashtriya Gokul Mission:**
  - **India's Rashtriya Gokul Mission, established in 2014**, initially designed to research and develop high-quality semen for various indigenous bovine varieties, the mission **has primarily focused on Gir cows** and not much on other breeds.
    - This preference for Gir cows **stems from their milk production and adaptability to different regions.**
- **Impact on Livestock Numbers:**
  - **The 2019 livestock census showed a 70% increase in purebred Gir cows since 2013.** In contrast, other indigenous breeds like **Sahiwal and Hariana** have not experienced similar growth, with some even witnessing a decline in numbers.
    - This trend raises concerns about the **loss of diversity in indigenous cattle breeds in India.**

### What are the Issues

#### with Indigenous Gir Cow Breed?

- **Inconsistent Performance of Graded Gir Cows:**
  - Contrary to the growing obsession with Gir cows, research reveals that graded Gir cows (**a crossbreed between Gir and other nondescript varieties**) **do not consistently outperform indigenous breeds in many states.**
    - For example, in **Haryana**, there is **no evidence of increased milk production in graded Gir cows.**
    - East Rajasthan has reported lower milk production in graded Gir cows compared to indigenous varieties, leading to farmer complaints about shorter lactation periods and reduced daily milk yields.
    - However, in west Rajasthan, graded Gir cows perform better due to favorable climatic conditions.
- **Factors Beyond Adaptation to Microclimates:**
  - The performance of graded Gir cows is **influenced by factors beyond their adaptability to microclimatic conditions.** For instance, Gir cows thrive in herds, and their milk production decreases when raised in isolation.
    - Without adequate resources and support, **these cows can become a liability for farmers. This was evident in a previous case in Vidarbha.**

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### What Solutions Can be Adopted?

- **Emphasis on Genetically Superior Indigenous Cows:**
  - Experts suggest a **shift from the current focus on a few high-yielding bovine varieties to identifying and breeding genetically superior cows from among indigenous breeds.**
    - Maharashtra's animal husbandry department **conducted a successful experiment in 2012-14** by delivering semen from genetically superior indigenous breeds to farms, showcasing the potential of this approach.
- **Long-Term Prospects of Indigenous Bovine Varieties:**
  - India boasts a **diverse cow population, each adapted to specific regions.** Continuous crossbreeding could lead to the extinction of region-specific traits in graded varieties.
    - For instance, crossbreeding **Badri cows from Himachal Pradesh and Uttarakhand with Gir cows** may increase milk production but could alter their physiology, **which need to be avoided.**
- **Lessons from the Past and Future Goals:**
  - Experts caution against repeating the mistakes of the **White Revolution**, which imported exotic breeds like **Jersey** for crossbreeding with Indian varieties.
    - While this increased milk production, it did not necessarily lead to higher income for livestock rearers, **as crossbred cows were more susceptible to diseases and required more care.**

#### What is Rashtriya Gokul Mission?

- **About:**
  - It is being implemented for **development and conservation of indigenous bovine breeds since December 2014.**
  - The scheme is also continued **under umbrella scheme Rashtriya Pashudhan Vikas Yojna from 2021 to 2026** with a budget outlay of Rs.2400 crore.
- **Nodal Ministry:**
  - Ministry of Fisheries, Animal Husbandry and Dairying
- **Objectives:**
  - To enhance productivity of bovines and increase milk production in a sustainable manner using advanced technologies.

- To propagate use of high genetic merit bulls for breeding purposes.
- To enhance Artificial insemination coverage through strengthening breeding network and delivery of Artificial insemination services at farmers doorstep.
- To promote indigenous cattle & buffalo rearing and conservation in a scientific and holistic manner.

### What are the Related Schemes for the Livestock Sector?

- **Animal Husbandry Infrastructure Development Fund (AHIDF)**
- **National Animal Disease Control Programme**
- **Rashtriya Gokul Mission**
- **National Artificial Insemination Programme**
- **National Livestock Mission**
- **National Kamdhenu Breeding Centre**
- **Gokul Grams**
- **"E-Pashu Haat"- Nakul Prajnan Bazaar**

## Goan Cashew Gets GI Tag

### Why in News?

Recently, **Goan cashew (kernel)** got the **Geographical Indication (GI) tag** where recognition is hailed as a great opportunity for the cashew industry in the state and "a milestone towards Swayampurna Goa mission".

### What is Goan Cashew?

- Cashew was native to northeast Brazil in Latin America and **Goan Cashew** was introduced to Goa by the **Portuguese in the 16<sup>th</sup> century (1570).**
- Initially used for **afforestation and soil conservation**, its economic value became known a century later.
- Cashew production grew from a **cottage industry to a major contributor to Goa's economy**, mainly due to its demand in the US.



### What are the Key Facts of Cashew?

- **About:**

Note:



- Cashew is one of the most important plantation crops in India as it brings in considerable foreign exchange earnings. **In the state of Goa, it occupies the largest area among horticultural crops.**
- **Soil and climate:**
  - **Well-drained deep sandy loam soils** are the best for growing cashew. Heavy clay soils are not suitable, as cashew does not withstand water logging.
  - In general, **all soils from sandy to laterite are well suited for this crop.**
- **Rainfall:**
  - Cashew is very well adapted to Indian coastal areas under conditions with relative humidity in

the range of 60 to 95 % and annual precipitation in the **range of 2000 to 3500 mm.**

➤ **Temperature:**

- Hot humid conditions with temperature in the range of 20 to 38° C are suitable for cashew cultivation. **Extreme low temperature and frost are not conducive** to raise cashew plantations.

➤ **Major Producing States:**

- As per **National Horticulture Board, Maharashtra is the leading producer of cashew nuts followed by** Andhra Pradesh, Orissa, Tamil Nadu, Karnataka, Kerala, Chhattisgarh, West Bengal, Meghalaya, Gujarat in 2021-2022.

## Vizhinjam International Seaport Project

### Why in News?

The **Vizhinjam International Seaport Project**, India's first deepwater transshipment port, has gained attention recently as the **first cargo ship arrived at the port.**



Note:



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# Major Ports in India



- Ports in India are classified as **Major** and **Minor Ports** according to the jurisdiction of the Central and State government as defined under the **Indian Ports Act, 1908** i.e. Major Ports are owned and managed by the Central Government and Minor ports are owned and managed by the State Governments.
- The **Major Port Authorities Act, 2021** provides for regulation, operation and planning of major ports in India and provide greater autonomy to these ports. It replaced the Major Port Trusts Act, 1963.
- There are **12 major ports**. **13<sup>th</sup> Major Port** (under construction) is **Vadhavan port, Maharashtra**.

## Note:

- A transshipment deepwater seaport is a port that can handle large ships that carry cargo from one place to another.
- It has a **deep water channel and a large berth area** for loading and unloading goods. It also allows the transfer of cargo from one ship to another at the port.

## What is the Vizhinjam International Seaport Project?

- The Vizhinjam International Transshipment Deepwater

Multipurpose Seaport is an ambitious project taken up by the **Government of Kerala**.

- It is designed to primarily cater to the **transshipment and gateway container business** with provision for a cruise terminal, liquid bulk berth and facilities for additional terminals.
- The port is currently being developed with a **Public Private Partnership**, with **Adani Ports Private Limited** with a component structured on a **design, build, finance, operate, and transfer ("DBFOT")** basis.

Note:



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- It is strategically situated near **Thiruvananthapuram, Kerala**. Its location along the southern coast of India provides easy access to **international shipping routes**.
  - It is positioned to compete with global transshipment hubs like **Colombo, Singapore, and Dubai**, reducing the **cost of container movement** to and from foreign destinations.
- The port boasts a **natural depth of more than 18 meters**, which can be further scaled up to 20 meters.
  - This depth is crucial as it enables the port to accommodate large vessels and mother ships with substantial cargo capacities.
- Initial capacity in the **first phase is set at one million (twenty-foot equivalent units)TEUs**, with potential for expansion to 6.2 million TEUs.
- **Project Progress:**
  - Expected to generate 5,000 direct job opportunities and stimulate an industrial corridor and cruise tourism.
  - The project is approximately **65.46% complete**. The project has experienced delays over the years, mainly due to factors like natural disasters, protests, and logistical challenges.
    - The current timeline anticipates the first phase's operational readiness by December 2024.

### Why India Needs a

#### Deepwater Container Transshipment Port?

- India has **12 major ports**. However, the country lacks a **landside mega-port and terminal infrastructure** to deal with ultra-large container ships.
  - Hence, nearly **75% of India's transshipment cargo** is handled at ports **outside India**, mainly Colombo, Singapore, and Klang.
- In fiscal 2021-22, the total transshipment cargo of India was about **4.6 million TEUs, out of which about 4.2 million TEUs** were handled outside India.
- Developing a port into a Transshipment Hub will accrue significant benefits such as **forex savings, foreign direct investment, increased economic activity** at other Indian Ports, development of related logistics infrastructure, employment generation, improved operation/logistics efficiencies and increase in revenue share.
  - It also encourages related businesses, including ship services, logistics, and bunkering.

- A deepwater container transshipment port can attract a large share of the container transshipment traffic which is now being diverted to Colombo, Singapore and Dubai.

## Bidenomics

### Why in News?

The **Year 2024** will be highly significant for the global economy due to elections in **major influential economies: India, Russia, the UK, the EU, and the US**; where in the US, the **Bidenomics** is supposedly going to be a major electoral plank.

### What is Bidenomics?

- **About:**
  - Bidenomics is a term that is used to refer to any and every policy choice made by the Biden administration in the US.
  - According to the White House, Biden's economic vision is centered around **three key pillars**:
    - Making **smart public investments** in America.
    - **Empowering and educating workers** to grow the middle class.
    - **Promoting competition to lower costs and help entrepreneurs** and small businesses thrive.
- **Features:**
  - Bidenomics involves policies that improve US's **physical and digital infrastructure**, **reduce its trade dependence on rivals** such as China.
  - **Raise the living standards and opportunities available** for the middle 40% and the bottom 50% of the US population and **boost job creation within its borders**.
- **Implementation:**
  - Bidenomics aimed to **raise revenue via more and higher taxation**, while on the other, it decided to make massive spending towards **investments in clean energy and in reducing healthcare costs**.

### What is the Rationale Behind Bidenomics?

- **Reagan's Top Down Model:**
  - With the failure of Reagan's Top-Down model and **trickle down approach**, it was envisaged that similar initiatives can not bring results on the ground and groundbreaking initiatives are required to mitigate covid crisis.

Note:



### ➤ Present Context:

- The US recognized that some of **Post-Covid challenges** were rooted in a **failed trickle-down theory** which led to the **proposition of a new Economic Model** called **Bidenomics** to alter the trickle-down theory based on Reaganomics.

### Why Does Bidenomics Matter?

#### ➤ Concerns Surrounding Bidenomics:

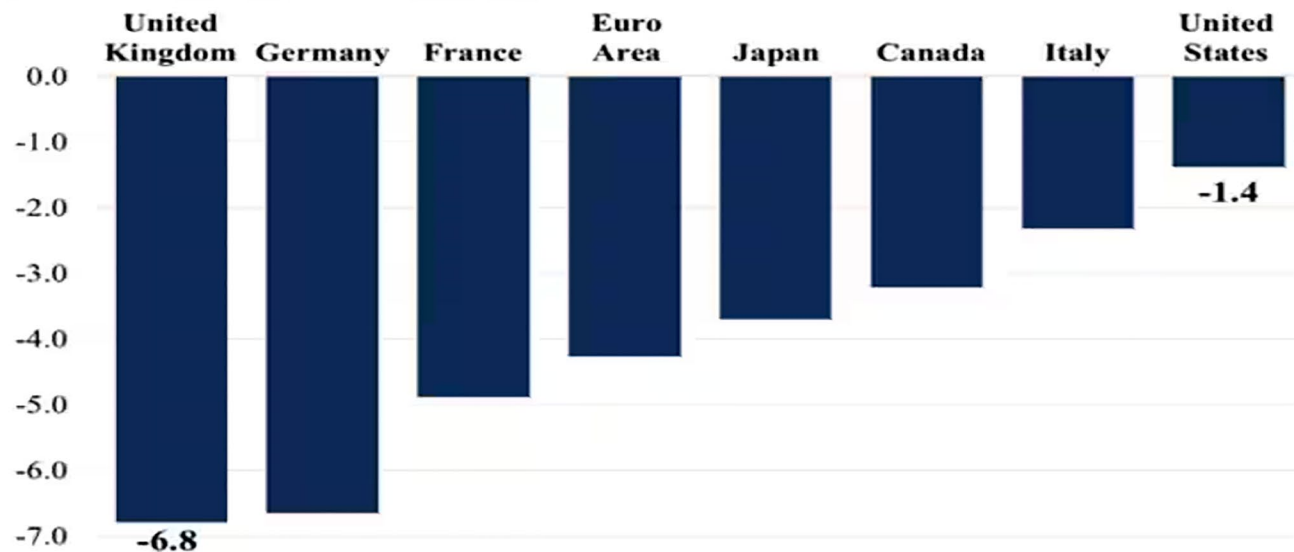
- **Global Influence:** Bidenomics is not only influential within the US **but is also viewed as a model for change globally**, with examples like the UK's Labour Party considering a more interventionist approach.

### ➤ Bidenomics: A Double-Edged Sword:

- **Potential for a Global Subsidy Race:** Critics worry that Bidenomics, **with its focus on domestic producer subsidies**, could trigger a **global race of subsidies** among countries, **especially post covid crisis**.
- **Macro-Indicators:**
  - As things stand, if one looks at the macro indicators — **GDP, unemployment and inflation** — the Biden administration seems to have done quite well.
- **Economic Recovery:**
  - The US economy continues to create millions of jobs at such a fast pace **that there are two vacancies for every unemployed person in the economy**.

## Real GDP Shortfall Relative to Pre-Pandemic Trends

Percent change, 2023 Q1 vs. Trend



Source: Haver Analytics, authors' calculations. Pre-pandemic trend is estimated over 2015-2019.

### (Seas) Unemployment Rate



Click and drag in the plot area to zoom in. Hover over chart to view data.  
Source: U.S. Bureau of Labor Statistics.

Note:



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### What are Other Similar Initiatives Adopted by Other Countries?

#### ➤ Abenomics:

- Abenomics is an economic policy framework that was implemented in Japan by Prime Minister Shinzo Abe. The primary goal of Abenomics was to revitalize the Japanese economy, **which had been facing deflation, slow growth, and economic stagnation for many years.**
- **Monetary Policy:** The Bank of Japan, implemented a policy of “**quantitative and qualitative monetary easing**” (QQE) to combat deflation.
- **Fiscal Policy:** The second arrow emphasized **expansionary fiscal policies**, including increased government spending and public investments to stimulate demand and boost economic growth.

### What are the Economic Revival Initiatives Undertaken by India?

- Faced with uncertainty in the last two years, the Government of India adopted strategies that combined a bouquet of safety-nets to cushion the impact of **Covid Pandemic** on vulnerable sections of society/business. Some of the initiatives are:
- **New Economic Policy:**
  - India announced a **new economic policy in 2020**, in response to the Covid-19 pandemic and its impact on the economy.
  - The policy consists of a **stimulus package of Rs 20 lakh crore, equivalent to 10% of GDP**, to support various sectors and segments of the economy.
- **Production-linked Incentive (PLI) Scheme:**
  - India launched a **PLI scheme** in 2020, to boost manufacturing and exports in key sectors, such as **automobiles, electronics, pharmaceuticals, textiles, and renewable energy.**
  - The scheme offers financial incentives to eligible manufacturers based on their incremental sales and investment **over a period of five years.**
- **Labour Codes:**
  - These are **four codes** that aim to consolidate and simplify central labor laws into four broad categories: wages, industrial relations, social security, and occupational safety and health.

#### ➤ Atmanirbhar Bharat Mission:

- **Atmanirbhar Bharat Abhiyan** (or Self-reliant India Mission) with an economic stimulus package — worth Rs 20 lakh crores aimed towards achieving the mission was announced.



## India-Japan Chip Supply Chain Partnership

### Why in News?

Recently, the Union Cabinet has approved a **Memorandum of Cooperation (MoC)** between India and Japan on developing a semiconductor supply chain partnership.

- In recent times, India is looking to establish itself as a reliable presence in the **semiconductor supply chain**, especially at a time when companies are looking to diversify from China, which has been the hub of electronics manufacturing.

### What is the Significance of the Present Memorandum of Cooperation?

#### ➤ India-Japan Semiconductor Cooperation:

- The Memorandum of Cooperation (MoC) between India and Japan in the semiconductor supply chain **recognizes the significance of semiconductors for industry and digital advancements.**

Note:



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- This MoC was initially signed in July between India's IT Ministry and Japan's Ministry of Economy, Trade, and Industry.
- **India's Semiconductor Ambitions:**
  - India is **determined to establish a dependable presence in the global semiconductor supply chain while banking on its India Semiconductor Mission**, particularly as companies seek alternatives to China, post **Covid pandemic**.
  - India has **initiated a \$10 billion plan** to bolster **local chip production**, with companies like Micron Technology setting up assembly and packaging facilities in Gujarat.
  - **India-US Collaboration in Semiconductor Industry:**
    - India and the United States are collaborating to strengthen chip supply chains. **Both the countries reaffirmed their commitment to building resilient global semiconductor supply chains.**
    - **Major Investments in India's Semiconductor Sector:**
      - US chip companies like Microchip Technology and AMD are investing millions of dollars in India to expand their operations and set up research and development facilities.
      - Additionally, **Lam Research and Applied Materials are planning substantial investments** in engineering and training programs in India's semiconductor sector.

#### What are Semiconductors?

- Any of a class of crystalline solids **intermediate in electrical conductivity between a conductor and an insulator.**
- Semiconductors are employed in the **manufacture of various kinds of electronic devices, including diodes, transistors, and integrated circuits.**
- Such devices have found wide application because of their **compactness, reliability, power efficiency, and low cost.**
- As discrete components, they have found use in **power devices, optical sensors, and light emitters, including solid-state lasers.**

#### What is the India

#### Semiconductor Mission (ISM)?

- **About:**
  - The ISM was **launched in 2021** with a **total financial outlay of Rs 76,000 crore** under the aegis of the **Ministry of Electronics and IT (MeitY).**

- It is part of the **comprehensive program for the development of sustainable semiconductor and display ecosystems** in the country.
- The programme aims to **provide financial support to companies investing in semiconductors**, display manufacturing and design ecosystem.
- **Components:**
  - Scheme for setting up of Semiconductor Fabs in India:
    - It provides **fiscal support to eligible applicants for setting up of Semiconductor Fabs** which is aimed at attracting large investments for setting up semiconductor wafer fabrication facilities in the country.
  - **Scheme for setting up of Display Fabs in India:**
    - It provides fiscal support to eligible applicants for setting up of Display Fabs which is aimed at attracting large investments for **setting up TFT LCD / AMOLED based display fabrication facilities** in the country.
  - **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India:**
    - The Scheme **provides a fiscal support of 30% of the Capital Expenditure** to the eligible applicants for setting up of Compound Semiconductors / Silicon Photonics (SiPh) / Sensors (including MEMS) Fab and Semiconductor ATMP / OSAT(Outsourced Semiconductor Assembly and Test) facilities in India.
  - **Design Linked Incentive (DLI) Scheme:**
    - **DLI scheme** offers **financial incentives, design infrastructure support across various stages of development and deployment of semiconductor design** for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.

#### What are the Challenges Regarding Semiconductor Manufacturing in India?

- **Extremely Expensive Fab Setup:**
  - A semiconductor fabrication facility (or fab) can cost multiples of a billion dollars to set up even on a relatively small scale and lagging by a generation or two behind the latest in technology.

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- **Higher Investment:**
  - Semiconductors and display manufacturing is a **very complex and technology-intensive sector** involving huge capital investments, high risk, long gestation and payback periods, and rapid changes in technology, which require significant and sustained investments.
- **Minimal Fiscal Support from Government:**
  - The level of **fiscal support currently envisioned is minuscule when one considers the scale of investments** typically required to set up manufacturing capacities in the various sub-sectors of the semiconductor industry.
- **Lack of Fabrication Capacities:**
  - India has a decent chip design talent but it **never built-up chip fab capacity**. The **Indian Space Research Organisation (ISRO) and the Defense Research and Development Organisation (DRDO)** have their respective fab foundries but they are primarily for their own requirements and are also not as sophisticated as the latest in the world.
  - India has only one old fab which is located in Mohali, Punjab.
- **Resource Inefficient Sector:**
  - Chip fabs are also very thirsty units **requiring millions of litres of clean water**, an extremely stable power supply, a lot of land and a highly skilled workforce.

## India's Food Export Rejections in the United States

### Why in News?

The **United States Food and Drug Administration (FDA)** has recently disclosed data on food imports over the past four years. Among the nations engaged in **food exports** to the US, **India, Mexico, and China** have experienced the **highest incidence of refusals**.

- The data highlights the **hurdles faced by Indian food exporters in the American market**. High refusal rates continue to be a pressing issue.

### What are the Key Aspects Related to India's Food Export Rejections in the United States?

- **Refusal Statistics: India, Mexico, and China:**

- Between **October 2019 and September 2023**, India, Mexico, and China experienced significant refusals of **food export shipments to America**.
- India's refusal rate, which measures the percentage of shipments refused out of all food export shipments, **was 0.15%**.
  - In comparison, **China's refusal rate was 0.022%**, and **Mexico's was 0.025%**.
  - India's rate is substantially higher, signaling a **higher incidence of refusal relative to the total exports**.
- **Majors Factors Behind Refusals:**
  - The products consisted in whole or in part of a **filthy, putrid, or decomposed substance** or be otherwise unfit for food.
  - The products **contained Salmonella**, a bacteria that causes severe stomach infections.
  - The products used an **unapproved new drug**, an unsafe food additive, or a prohibited substance.
  - The products were **misbranded in terms of nutritional labels**, ingredients information, or health claims.
- **Long-Term Trends in India's Refusals:**
  - In the last decade, India's food export refusals have seen a downward trend in absolute terms. From a peak of 1,591 refusals in 2015, it decreased to 1,033 refusals in 2023.
    - Despite these refusals, **India's food exports** to the US stood at **USD 1.45 billion in FY23**, representing a **16% increase from the previous fiscal year**. Key exports included basmati rice, natural honey, guar gum, and cereal preparations etc.

### What is the International Measure Backing the Food Import Refusal By the United States?

- **About:**
  - The **World Trade Organization (WTO)'s Sanitary and Phytosanitary (SPS) Agreement** ensures that **traded products between WTO members do not spread pests and diseases**, and that **food products do not contain harmful substances or pathogens**.
  - The **"SPS Agreement"** entered into force with the establishment of the WTO on **1 January 1995**.
    - WTO has 164 member nations (including **India and the United States**).

Note:

### ➤ Major Provisions:

- Members have the **right to implement sanitary and phytosanitary measures for the protection of human, animal, or plant life and health**, provided such measures align with this Agreement.
- Measures should be based on scientific principles and supported by scientific evidence, except as provided in **Article 5(7) of the Agreement**.
- Measures should also **not discriminate unfairly between Members** and should not serve as a disguised restriction on international trade.
- Members must **accept equivalent sanitary and phytosanitary measures from other Members, even if they differ**.
  - The exporting Member must prove that its measures meet the importing Member's required level of protection.
  - Access for inspection and testing should be provided upon request.

### *How India can Improve its Food Safety and Quality Standards?*

- **Strict Inspection and Quality Control:** Strengthening the role and capacity of the **Food Safety and Standards Authority of India (FSSAI)**, the apex food regulator in the country, to **monitor, inspect, and certify food products** for domestic and export markets.
- **Enhanced Testing Protocols:** Developing and enforcing **comprehensive testing protocols** for food products to identify contaminants, pathogens, and adulterants.
  - Investing in advanced laboratory equipment for **more accurate and rapid testing**.
- **Supply Chain Transparency:** Utilizing **blockchain technology** to create transparent and traceable supply chains, enabling **rapid identification of the source of contamination or quality issues**.
- **Global Standards Adherence:** Adopting international best practices and standards for food safety and quality management, such as **Hazard Analysis and Critical Control Points (HACCP)**, **Good Hygienic Practices (GHP)**, and **Codex Alimentarius**.

## **Global Tax Evasion Report 2024**

### *Why in News?*

Recently, the **European Union Tax Observatory** has released '**Global Tax Evasion Report 2024**' highlighting

several critical issues related to tax evasion, the **Global Minimum Tax (GMT)** on billionaires, and measures to combat tax evasion.

- The report investigates the **effects of international reforms adopted over the past 10 years**, such as the automatic international exchange of bank information, and the international agreement on a **global minimum tax for MNCs**, among other issues.

### **What is Tax Evasion?**

- Tax evasion is the **illegal act of not paying taxes** that one owes to the government by underreporting income, inflating deductions, hiding money in offshore accounts, or using other fraudulent means to reduce one's tax liability.
- It is a **deliberate and unlawful attempt to reduce tax obligations** by misrepresenting or concealing financial information.

### *What are the International Reforms to Combat Tax Evasion?*

- **Global Minimum Tax (GMT):**
  - A GMT applies a standard minimum tax rate to a **defined corporate income base worldwide**.
  - The **Organization for Economic Cooperation and Development (OECD)** developed a proposal featuring a **corporate minimum tax** of 15% on foreign profits of large multinationals, which would give countries new annual tax revenues of USD 150 billion.
  - In October 2021, a group of 136 countries, including India, set a minimum global tax rate of 15% for MNCs and sought to make it harder for them to avoid taxation.
  - The framework of GMT aims to discourage nations from tax competition through lower tax rates that result in corporate **profit shifting and tax base erosion**.
- **Automatic Exchange of Information:**
  - The automatic exchange of information was introduced in 2017 to **fight offshore tax evasion by wealthy individuals**.

### *What are the Key Highlights of the Report?*

- **Challenges in Curbing Offshore Tax Evasion:**
  - Offshore tax evasion has decreased **over the past decade**. In 2013, 10% of the world's GDP was stored in global tax havens, but now only 25% of this wealth remains untaxed.

Note:



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- However, challenges remain, **including non-compliance by offshore financial institutions** and limitations in the automatic exchange of bank information.
- **Tax Rates Equivalent to 0%:**
  - Global billionaires have **effective tax rates equivalent to 0% to 0.5%** of their wealth, due to the frequent use of shell companies to avoid income taxation.
  - US billionaires have an effective tax rate equivalent to 0.5% of their wealth and **French billionaires a tax rate of zero.**
- **Profit Shifting by MNCs:**
  - Multinational corporations (MNCs) have shifted around USD 1 trillion to tax havens in **2022**, equivalent to 35% of the profits they earned outside their headquarters countries.
  - The report red-flagged the trend of “**Greenwashing the Global Minimum Tax**” wherein MNCs can use ‘green’ tax credits for low carbon transition to reduce their tax rates way below the minimum of 15%.
- **Importance of Policy Choices:**
  - Tax evasion, wealth concealment, and profit shifting to tax havens are not natural occurrences but results of policy choices or the failure to make necessary choices.
  - There is a **need to evaluate the consequences of tax policies** and make improvements for sustainable tax systems.
- **Recommendations:**
  - The report advocates for a **global minimum tax on billionaires**, proposing a rate of **2% of their wealth**. Institute mechanisms to tax wealthy people who have been long-term residents in a country and choose to move to a low-tax country.
    - This measure is seen as essential for governments **worldwide to increase their revenue**, address wealth inequality, and fund critical services like education, healthcare, and infrastructure.
  - Reform the international agreement on minimum corporate taxation **to implement a rate of 25%** and remove the loopholes in it that foster tax competition.
  - Implement unilateral measures to collect some of the tax deficits of multinational companies and billionaires in case global agreements on these issues fail.

- Move towards the **creation of a Global Asset Registry** to better fight tax evasion.
- Strengthen **the application of economic substance and anti-abuse rules.**

#### What is the Difference Between Income and Wealth Taxes?

- Wealth taxes are **assessed on the wealth stock**, or the total amount of net wealth owned by a taxpayer, whereas income taxes are levied on the flow from the wealth stock.
- **Example of a wealth tax:** Estate taxes, gift taxes, and inheritance taxes are examples of one-time or infrequently assessed wealth taxes.

#### What are the Government Measures to Curb Tax Evasion?

- **E-Invoicing**
- **The Fugitive Economic Offenders Act, 2018**
- **The Black Money (Undisclosed Foreign Income and Assets) and Imposition of Tax Act, 2015**
- **Prevention of Money Laundering Act, 2002.**

## India's Position in Global Economic Growth

### Why in News?

According to the **International Monetary Fund (IMF)**, India's contribution to global economic growth is expected to rise by 2%, as 16% contribution will grow to 18% in the next five years due to India growing faster.

### What are the Factors Contributing to India's Projected Growth?

- **Monsoon:**
  - While the overall rainfall was 6% below the expected during the **monsoon** season (due to 36% deficit rains in August), the spatial distribution is quite even. **Out of 36 states/UTs, 29 received normal/above-normal rains.**
  - The **SBI Monsoon Impact Index**, which considers the spatial distribution, has a value of 89.5, **far better than the full season index** value of 60.2 in 2022.
- **Continuous Thrust on Capital Expenditure:**

Note:

- During the first five months of the current year (2023), the capital expenditure of the states as a percentage of the **budgeted target is at 25%, while the Centre's is at 37%**, which is higher than the previous years and reflecting renewed capital generation.
- **New Company Registrations:**
  - The robust new companies' registration depicts strong growth intentions. Around 93,000 companies were registered in the first half of 2023-24 as compared to 59,000 five years back.
    - It is interesting to note that the average daily registration of new companies increased to 622 in 2023-24 (an increase of 58%) from 395 in 2018-19.
- **Credit Growth:**
  - All **scheduled commercial banks' (SCBs)** credit growth (year-on-year) has been accelerating since early 2022. Aggregate deposits grew by 13.2% and credit by 20% till September. In the coming months, the Government expects credit demand to remain robust due to the festive season.
- **Formalization of the Economy:**
  - The growth in credit is attributed to the formalization of the Indian economy over the past decade. **People with no previous credit history are increasingly becoming integrated with the banking system.**
  - Approximately **40% of new credit accounts added in the last nine years are from individuals who had no prior credit history.** This group contributes to at least 10% of the incremental credit growth.

### ***What are the Challenges Faced by India in Achieving its Projected Growth?***

- **Weak Demand:**
  - The demand for goods and services in India has been stagnant or declining due to various factors, such as **low income growth, high inflation, unemployment, and the impact of the Covid-19 pandemic.**
  - This has **affected the consumption and investment levels in the economy, and reduced the tax revenue for the government.**
- **Unemployment:**
  - Despite rapid economic growth, unemployment remains a serious issue in both rural and urban areas. The Covid-19 pandemic has worsened the

situation, **as many businesses have shut down or reduced their operations**, leading to job losses.

- According to the **National Statistical Office's (NSO) Periodic Labour Force Survey (PLFS) report** for the year 2021-22, the unemployment rate for 2021-22 was 4.1%.
- **Poor Infrastructure:**
  - India **lacks adequate infrastructure, such as roads, railways, ports, power, water, and sanitation**, which hampers its economic development and competitiveness.
  - **According to the World Bank**, India's infrastructure gap is estimated to be around \$1.5 trillion. Poor infrastructure also affects the quality of life and health of the people, especially in rural areas.
- **Balance of Payments Deterioration:**
  - India has been running a **persistent current account deficit**, which means that its imports exceed its exports. This reflects its dependence on foreign goods and services, especially oil and gold, and its low export competitiveness.
  - India's exports and imports **decreased by 6.59% and 3.63%, respectively, in 2022 over 2021.** Given this pace, **It will be difficult to achieve the USD 2 trillion export target by 2030.**
- **Geopolitical Tensions:** India's geopolitical relationships, including **border disputes**, can impact **regional stability** and potentially affect economic prospects.
  - India is increasingly vulnerable to **global economic uncertainties, including ongoing wars and conflicts** that may lead to crude oil inflation and supply shortages.
  - **Trade Imbalances:** India faces trade imbalances with some of its major trading partners, which can impact its **economic growth and stability.**

## **Supreme Court's Ruling Imposes Capital Taxation on Telecoms**

### ***Why in News?***

Recently, the **Supreme Court** (SC) has held that payment of **entry fee as well as variable annual license fee made by telcos** will be considered **capital expenditure** and **not revenue expenditure**, and taxed accordingly.

Note:



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### What are the Impacts of the SC's Ruling over Telecom Licence Fee?

#### ➤ Ruling:

- The SC's judgment stipulates that the payments made by telecom companies to the **Department of Telecommunication** as entry fees and annual license fees under the **(New Telecom) Policy of 1999** are now categorized as **capital expenditures** and may be **amortised** in accordance with **Section 35ABB of the (Income Tax) Act**.
  - This means that **instead of deducting the entire expenditure all at once**, the company will need to deduct a portion of the total fee over each year for tax purposes.

#### ➤ Impact:

- **Change in Accounting Treatment:** Telecom companies have traditionally **treated license fees as expenses**, allowing them to **claim deductions on a year-to-date basis for tax calculations**.
  - However, this ruling mandates a shift in the accounting treatment, requiring license fees to be considered as capital expenses.
  - These expenses must be **amortized over the license's holding period**.
- **Initial Impact on Cash Flow:** As a direct consequence of the change in accounting treatment, telecom companies may experience a temporary reduction in cash flow.

- Higher EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) and PBT (Profit Before Tax) may result from this shift, but it is likely to be offset over the license's duration.
- **Financial Strain:** The ruling is expected to affect companies that have **incurred substantial expenses to obtain telecom licenses**, particularly those already experiencing financial losses.
- **Uncertainty About Retrospective Application:** The **Supreme Court's order did not explicitly address** whether the new accounting structure should be applied **retrospectively**.
  - This has raised concerns within the telecom industry, as well as questions regarding tax liabilities for prior periods.

#### What is Amortization?

- It is an **accounting process** used to spread the cost of an **intangible asset or a capital expense** over its useful life.
  - This gradual allocation of expenses helps match the cost of the asset with the revenue it generates over time.
- In simpler terms, it **means dividing a large expense into smaller portions and recognizing those portions as expenses** on financial statements over a specific period.
  - This practice ensures a **more accurate representation of the asset's impact on a company's financial statements** and tax liability over time.

### What is the Difference Between Capital and Revenue Expenditure?

Aspect	Capital Expenditure	Revenue Expenditure
Nature of Expenses	Expenses related to <b>acquiring, improving, or extending long-term assets</b> or investments expected to benefit for more than one financial year.	<b>Day-to-day operational expenses</b> incurred for maintaining and supporting existing assets or services.
Accounting Treatment	<b>Capitalized on the balance sheet</b> and recognized over time through amortization or depreciation.	Fully <b>recognized as expenses</b> in the year incurred on the income statement.
Tax Treatment	Subject to <b>depreciation or amortization</b> , leading to a delayed tax impact and often lower taxable income in the year of purchase.	Immediately <b>deductible from taxable income</b> , providing an immediate reduction in tax liability.

Note:

<b>Impact on Profitability</b>	Generally <b>does not significantly impact short-term profitability</b> as costs are spread over several years.	Has an <b>immediate impact on profitability</b> , as expenses are fully recognized in the year incurred.
<b>Examples</b>	Acquiring a <b>new manufacturing facility</b> , research and development for a new product, long-term license or franchise.	<b>Routine machinery maintenance</b> , employee salaries, advertising costs, utility bills.

## China To Curb Exports Of Graphite Material

### Why in News?

Recently, China, **the world's top graphite producer (around 65%) and exporter**, has decided to curb exports of key battery material.

- The curbs are similar to those in place since 1<sup>st</sup> August, 2023 for two chip-making metals, **gallium and germanium** which pushed up prices outside of the country.

### What is China's Decision To Curb Exports of Graphite And Its Impacts?

- **Significance:**
  - This move is aimed at **protecting China's national security and controlling supplies of critical minerals** in response to challenges over its global manufacturing dominance.
    - Graphite, Cobalt, Nickel etc are important critical minerals as reflected in **Mineral Security Partnership** which India is not part of.
  - It also becomes important for major **Electric vehicles (EVs)** manufacturers across the world and also India due to its **National Electric Mobility Mission Plan (NEMMP)** where Graphite is a key component.
- **Restrictions:**
  - China will require as of December 1<sup>st</sup> that exporters apply for permits to **ship two types of graphite**, including high-purity, high-hardness and high-intensity synthetic graphite material, and natural flake graphite and its products.
  - Meanwhile, it **dropped temporary controls on five less sensitive graphite items** used in basic industries such as steel, metallurgy, and chemicals.
- **Concern for EV Manufacturers:**
  - South Korean firms which heavily rely on China for

graphite imports would need to seek alternatives, **such as mines from the United States or Australia.**

- With rising sales of EVs, automakers are racing to lock in supplies from outside China, but **shortages are looming, which is all set to push the costs manifold.**

### What is Graphite?

- **About:**
  - Graphite is a naturally occurring mineral composed of carbon. It is **one of the three crystalline forms of carbon**, with the other two being diamond and amorphous carbon (such as charcoal or carbon black).
- **Structure:**
  - Graphite has a hexagonal crystal structure in which carbon atoms are arranged in layers or sheets. These layers are weakly bonded together, **allowing them to easily slide past each other, giving graphite its lubricating properties.**
- **Properties:**
  - Graphite is a **good conductor of both electricity and heat.** It is used in the production of electrodes for batteries and in the electronics industry.
- **Applications:**
  - Graphite is commonly known for its use in pencils. **The "lead" in pencils is actually a mixture of graphite and clay.**
  - Other applications include **crucibles, foundry facings, polishes, arc lamps, batteries, brushes for electric motors, and cores of nuclear reactors.**
- **Global Reserves:**
  - China produces two-thirds of the world's graphite, but compared to global reserves, the Asian country is not the only option.
  - According to the United States Geological Survey, **Turkey (27.3%) and Brazil (22.4%) together own half of the world's natural graphite resources. China comes third, sitting on 16%, followed by Madagascar (7.9%).**

Note:



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## Top producers of rare minerals 2020

Metal	Share of key producers	India's production share
Lithium	Australia (49%), Chile (22%), China (17%), Argentina (8%), Brazil (2%)	-
Graphite	China (65%), Brazil (10%), Madagascar (5%), India (3%), Mozambique (2%)	3%
Cobalt	Congo (68%), Australia (4%), Cuba (4%), Canada (3%), Philippines (3%)	-
Manganese	South Africa (32%), Gabon (16%), China (13%), Australia (10%)	5.32%
Nickel	Indonesia (33%), Philippines (13%), Russia (9%), New Caledonia (8%) Australia (7%)	-

## Expected mineral demand of the EV sector (in thousand tonnes)

	2020	2030	Growth (%)
Graphite	141.03	2,499.25	1,672
Nickel	80.47	1,566.94	1,847
Copper	110.32	1,632.63	1,380
Lithium	19.83	358.39	1,707
Cobalt	21.12	256.64	1,115
Manganese	25.34	246.28	872

## EVs need more minerals than a conventional vehicle

	Conventional vehicle	Electric vehicle
Graphite	-	66.3
Nickel	-	39.9
Copper	22.3	53.2
Lithium	-	8.9
Cobalt	-	13.3
Manganese	11.2	24.5



## Proposed Reforms For Multilateral Development Banks

### Why in the News?

Recently, a **G20** expert panel has recommended that Multilateral Development Banks (MDBs), should shift their approach from funding individual projects to focusing on sector-specific programs and long-term transformation plans as outlined by national governments.

### What are Multilateral Development Banks?

- **MDBs** are international institutions comprising developed and developing countries.
- They offer financing and technical assistance for various projects in areas like transportation, energy, urban infrastructure, and waste management.

- Developed countries contribute to MDB lending, while developing nations typically borrow from them for development projects.
- MDBs have been instrumental in supporting the development of both low-income and middle-income countries (LICs and MICs) by addressing issues such as poverty reduction, infrastructure development, human capital formation, etc.
- MDBs include the **World Bank Group**, the **Asian Development Bank**, the African Development Bank, the Inter-American Development Bank, etc.



- The African Development Bank (AfDB)
- The Asian Development Bank (ADB)
- The European Bank for Reconstruction and Development (EBRD)
- The European Investment Bank (EIB)
- The Inter-American Development Bank (IADB)
- The Islamic Development Bank (IsDB)
- The World Bank Group (WBG)

Note:

**Why are Experts****Advocating for Reforms within MDBs?**

- **Climate Crisis** :The G20 expert panel argues that the climate crisis necessitates reforms in MDBs to address global challenges, especially in emerging markets and developing economies (EMDEs)
- **Long Term Transformation** : MDBs should align their operations with the **Sustainable Development Goals (SDGs)** identified by national governments, focusing on long-term transformation plans.
- **Private Sector Engagement** : Greater private sector engagement should be central to MDB operations, breaking from their historical separation of private and sovereign financing arms.
- **Coordination**:The success of MDBs depends on enhanced coordination among various stakeholders.The reforms should aim to mitigate coordination failures between domestic and international stakeholders, public and private.
- **National Involvement** :National governments should have a more prominent role in shaping a unified vision of goals, policies, investments, and financing.

**How have MDBs Traditionally Lent in India?**

- **World Bank's Commitment to India:**
  - The **World Bank**, established in 1944, has committed USD 97.6 billion in lending to India, encompassing both active and closed projects.
  - Out of the total commitments,19% has been dedicated to projects in the public administration sector, 15% to agriculture, fishing, and forestry, and 11% to the transport sector.
- **Asian Development Bank's (ADB) Involvement:**
  - The **ADB**, based in Manila and established in 1969, has committed USD 59.7 billion in assistance to India, covering both project and technical assistance.
  - Of the total assistance, 34% has been allocated to the transport sector, 25% to the energy sector, and 10% to urban infrastructure.
- **Asian Infrastructure Investment Bank's (AIIB) Contribution:**
  - The **AIIB**, headquartered in Beijing and founded in 2016, has approved USD 9.9 billion in financing for India.
  - Of this amount, 42% has been designated for the transport sector, 14% for the energy sector, and 12.6% for economic resilience.

**Blueprint for Transforming the Blue Economy****Why in News?**

Recently, Indian Prime Minister unveiled '**Amrit Kaal Vision 2047**', the long-term blueprint for the **Indian maritime blue economy** while inaugurating **Global Maritime India Summit 2023** in Mumbai.

- It includes initiatives like **Advanced Mega Ports**, an **International Container Trans-shipment Port**, island development, **Expanded inland waterways**, and **multi-modal hubs** for efficient trade.
- The Prime Minister also highlighted the government's vision for the maritime sector, encapsulated in the phrase '**Ports for Prosperity**' and '**Ports for Progress.**'

**What is the Global Maritime India Summit 2023?**

- **About:**
  - **Global Maritime India Summit (GMIS) 2023** is a flagship event aimed at propelling the Indian maritime economy by promoting global and regional partnerships and facilitating investments.
    - It is an annual meet of the Indian and international maritime community to address key industry issues and exchange ideas to bring the sector forward.
- **Organisers**
  - **Ministry of Ports, Shipping and Waterways**
  - **Indian Ports Association**
  - **Federation of Indian Chambers of Commerce and Industry (FICCI)**

**What is the Blue Economy?**

- **About:**
  - According to the **World Bank**, the blue economy is the "**sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem.**"
- **Significance of the Blue Economy:**
  - **Food Security:** Fisheries and aquaculture are integral components of the **Blue Economy**, providing a **substantial portion of the world's protein sources**. Sustainable practices in these sectors are essential for global food security.economy

Note:



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- **Environmental Conservation:** By promoting responsible resource management, the Blue Economy supports the **preservation of marine biodiversity and ecosystems**.
  - Healthy oceans play a crucial role in climate regulation and carbon sequestration.
- **Tourism and Recreation:** Coastal and marine tourism is a significant contributor to the global economy.
  - The Blue Economy enhances **opportunities for tourism and recreation**, attracting visitors to coastal areas and promoting conservation awareness.
- **Renewable Energy:** It encourages the development of renewable energy sources such as **offshore wind, tidal, and wave energy**, reducing reliance on fossil fuels and mitigating climate change.
- **Transportation and Trade:** Maritime shipping is a **lifeline for global trade**. Efficient and sustainable maritime transportation is vital for the global economy.

**Note:** India has a **vast coastline of 7500 km**, and its **exclusive economic zones (EEZ) extend over 2.2 million square km**. Also, India is home to **12 major ports, over 200 other ports, 30 shipyards** and a comprehensive hub of diverse maritime service providers. This means India has much potential to be a frontrunner in a healthy **blue economy**.

### **What are the Challenges Related to India's Blue Economy?**

- **Fragmented Fishing Industry:** The Indian fishing industry is **highly fragmented**, primarily comprising small fishermen who lack access to credit and modern technology, hindering their competitiveness.
  - Also, **overfishing**, driven by a lack of regulation, further threatens the industry's sustainability.
- **Climate Change and Natural Disasters:** Climate change poses a significant threat to the Blue Economy through **sea-level rise, increased ocean acidity, and extreme weather events**.
  - Preparing for and mitigating these impacts is essential for long-term sustainability.
- **Waste and Pollution:** Pollution, including **marine litter, chemical pollutants, and untreated sewage**, threatens the health of marine ecosystems.

- The introduction of **non-native, invasive species through oil spills** can disrupt marine ecosystems and negatively impact indigenous species and industries.

- **Congestion in Ports:** Many **Indian ports** experience congestion due to **inadequate maintenance infrastructure, inefficient operations, and high cargo volumes**, leading to delays and increased costs.

### **What are the Key Government Initiatives Related to the Blue Economy?**

- **Deep Ocean Mission**
- **Sagarmala project**
- **O-SMART**
- **Integrated Coastal Zone Management**
- **NavIC**

## **Minimum Support Price**

### **Why in News?**

Recently, the Centre has announced hikes in the **Minimum Support Price (MSP)** for wheat and **five other Rabi Crops** for the 2024-25 marketing season.

- The most significant increase is for wheat, **with a Rs 150 per quintal hike**, the highest since 2007-08.
- Wheat is a crucial rabi crop and is the second-largest crop in terms of **area coverage in India and plays a crucial role** in the economy.

### **What is the Minimum Support Price?**

- **MSP iNeed for MSP:**
  - The twin droughts of **2014 and 2015 forced the farmers** to suffer from declining commodity prices since 2014.
  - The twin shocks of **Demonetisation and the Rollout of GST**, crippled the rural economy, primarily the **non-farm sector**, but also agriculture.
  - The slowdown in the economy after 2016-17 followed by the pandemic further ensured that the **situation remains precarious for the majority of the farmers**.
  - Higher input prices for diesel, electricity and fertilisers have only contributed to the misery.
  - It ensures that farmers receive a fair price for their crops, which helps in reducing farm distress and poverty. This is particularly **crucial in states where agriculture is a major source of livelihood**.

Note:



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## MINIMUM SUPPORT PRICE (MSP)

The rate at which the govt. purchases crops from farmers; based on a calculation of at least 1.5x the cost of production incurred by the farmers

### RECOMMENDED BY

Commission for Agricultural Costs & Prices (CACP) (recommends MSPs for 22 mandated crops and Fair and Remunerative Price for Sugarcane)

### 22 MANDATED CROPS

(14 Kharif, 6 Rabi and 2 Other Commercial crops)

7	<b>CEREALS</b>	Paddy, Wheat, Barley, Jowar, Bajra, Maize And Ragi
5	<b>PULSES</b>	Gram, Arhar/tur, Moong, Urad And Lentil
7	<b>OILSEEDS</b>	Groundnut, Rapeseed/mustard, Soyabean, Sunflower, Sesamum, Safflower And Niger Seed
	<b>RAW COTTON</b>	
	<b>RAW JUTE</b>	
	<b>COPRA</b>	

MSP is the price at which the govt. is supposed to procure the mandated crops from farmers if the market price falls below it

### FACTORS FOR RECOMMENDING MSP

- Cost of cultivation
- Demand-Supply situation for the crop
- Market price trends
- Inter-crop price parity
- Implications for consumers (inflation)
- Environment (soil and water use)
- Terms of trade b/w agri and non-agri sectors (ratio of farm inputs and outputs)

Considers both A2+FL and C2 costs

Actual expenses on seeds, fertilisers, irrigation and the like

Unpaid family labour

A2 + FL

C2

Rentals or interest foregone on owned land and fixed capital assets

MSP has no statutory backing — a farmer cannot demand MSP as a matter of right



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## What are the Concerns Related to MSP in India?

### ➤ Limited Extent:

- The MSP is officially announced for 23 crops, but in practice, **only two, rice and wheat, are extensively procured** and distributed under the **National Food Security Act (NFSA)**.
- For the rest of the crops, the MSP implementation is **ad-hoc and insignificant**. This means that the majority of farmers growing non-target crops do not benefit from the MSP.

### ➤ Ineffective Implementation:

- The Shanta Kumar Committee, in its 2015 report, revealed that **only 6% of the MSP was actually received by farmers**.
- This suggests that a significant portion of farmers, around 94%, do not benefit **from the MSP**. The primary reason for this is inadequate procurement mechanisms and market access for farmers.

### ➤ Skewed Crop Dominance:

- The focus on MSP for rice and wheat has **led to a skewed cropping pattern** in favor of these two staples. This overemphasis on **these crops can have ecological, economic, and nutritional implications**.
- It may not align **with market demands**, thereby limiting income potential for farmers.

### ➤ Middlemen Dependency:

- The MSP-based procurement system often involves intermediaries such as middlemen, commission agents, and officials from **Agricultural Produce Market Committees (APMCs)**.

Note:



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- Smaller farmers, in particular, may find it challenging to access these channels, leading to inefficiencies and reduced benefits for them.

#### ➤ Burden on Government:

- The government shoulders a significant financial burden in **procuring and maintaining buffer stocks of MSP-supported crops**. This diverts resources that could be allocated to other agricultural or rural development programs.

## Crop Switching for Sustainable Agriculture

### Why in News?

A recent study, featured in the *journal Nature Water*, was conducted by a team of researchers from the Indian Institute of Technology Bombay, the University of Delaware, Columbia University, and Yale School of the Environment.

- This study focuses on addressing **water consumption and sustainable agriculture** in India's northern plains, particularly the **Indo-Gangetic region**.
- The study focused on 124 districts in Uttar Pradesh, Bihar, and West Bengal, covering the upper, middle, and lower **Ganga** basin in India.

### What are the Key Findings from the Study?

- **Water Conservation through Crop Switching:**
  - Replacing rice with **millets** (pearl millet (bajra) and sorghum) during the **Kharif**

# Millets

## About

- Small-grained cereals also known as **coarse grains**
- Often referred to as **'Superfood'**
- Among the **first crops to be domesticated** - evidence of millet consumption dates back to the **Indus Valley Civilisation (3,000 BC)**

## Climatic Conditions

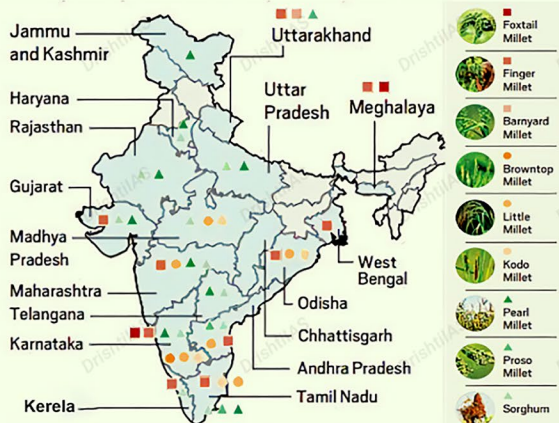
- **Mainly a Kharif crop in India**
- **Temperature:** 27°C - 32°C
- **Rainfall:** Around 50-100 cm
- **Soil Type:** Inferior alluvial or loamy soil

## India and Millets

- **Global Largest Millet Producer:**
  - 20% of global production, 80% of Asia's production
- **Common Millets:**
  - **Ragi** (Finger millet), **Jowar** (Sorghum), **Sama** (Little millet), **Bajra** (Pearl millet), and **Variga** (Proso millet)
  - **Indigenous varieties** (small millets) - **Kodo, Kutki, Chenna and Sanwa**
- **Top Millets Producing States:**
  - Rajasthan (largest), Karnataka, Maharashtra, Madhya Pradesh and Uttar Pradesh
- **Govt. Initiatives:**
  - Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP)
  - **'India's Wealth, Millets for Health'**
  - Millet Startup Innovation Challenge
  - **Hiked MSP** for Millets
  - Agriculture Ministry declared millets as **"Nutri Cereals"** in 2018

## Significance

- Less expensive, **nutritionally superior**
- High protein, fibre, minerals, iron, calcium and a **low glycemic index**
- Help tackle **lifestyle problems and health** (obesity, diabetes etc.)
- Photo-insensitive, **resilient to climate change & water efficient**



## International Year of Millets - Year 2023

Proposed by India, declared by UNGA



season and shifting from **wheat to sorghum** in the **Rabi season** can reduce water consumption in the **Indo-Gangetic Plains (IGP)** by **32%**. And boost **farmers' profits by 140%**.

➤ **Beyond Water Conservation:**

- Crop switching can improve **water savings by 55%** in the Kharif season and **9% in the Rabi season**.
- Farmers' **profits can increase by 139%** during the Kharif season and **152% during the Rabi season**.
- Calorie production can increase by 39%.

➤ **Crop Switching vs. Drip Irrigation:**

- The authors compared the benefits of crop switching vis-a-vis improving irrigation efficiency — from flood to drip irrigation, and found that Crop switching outperforms **drip irrigation** in reducing **groundwater depletion** and energy savings.
- Drip irrigation improves net **groundwater recharge by 34%**, while crop switching achieves a **41% improvement**.
  - Drip irrigation alone does not enhance calorie production or farmer profits.
- A **combination of crop switching and drip irrigation** shows the greatest improvement in net recharge at the district level and **reduces groundwater depletion by 78%**.

➤ **The Multi-Objective Approach:**

- A multi-objective approach is essential for achieving a balance between water conservation, increased calorie production, and higher farmer incomes.
- **Single-focused approaches come with trade-offs.** For instance, prioritizing water conservation alone may boost savings by 4%, but it leads to significant reductions: Calorie production falls by 23%, and Profit drops by 126%, respectively, compared with the proposed solutions.
- Similarly, a profit-maximizing approach may slightly increase water savings but also reduce calorie production.
  - Choosing a **profit-maximizing strategy centred around sorghum**, with its high minimum support price and low cultivation costs, can significantly boost profits by 58%. However, this gain is coupled with a stark trade-off: a notable 18.5% reduction in calorie production, a marginal 2% increase in water savings.

➤ **Nutri Cereals for Improved Nutrition:**

- Shifting to Nutri **cereals**, including sorghum and bajra, offers improved nutrition.
- Nutri cereals can lead to a **46% increase in protein production**, a 353% increase in iron production, and an 82% increase in zinc production, benefiting consumers in terms of nutrition.

**North Indian Plains**

➤ **About:**

- They are a large flat landmass that lies south of the Himalayas and north of the Peninsular India.
- They are formed by the alluvial deposits of three major river systems: the Indus, the Ganga, and the Brahmaputra, along with their tributaries.
  - They are the largest alluvial tract of the world.

➤ **Geographical Overview:**

- The Indo-Gangetic region has a **subtropical climate** with hot summers and cool winters.
- The northern plains can be divided into **four physiographic regions** based on the nature of the alluvium and the relief features.

➤ **Bhabar:**

- It is a narrow belt of coarse gravel and pebbles along the foothills of the Himalayas. It is about 8 to 16 km wide and has a porous surface that allows water to seep through it.

➤ **Terai:**

- It is a marshy and swampy region south of the Bhabar. It is about 20 to 30 km wide and has a rich soil and dense vegetation. It is also home to many wildlife sanctuaries and national parks

➤ **Bhangar:**

- It is the **older and higher alluvial plain** that lies above the flood level of the rivers. It is composed of clay, silt, and sand.
- The soil in this region contains calcareous deposits, locally known as kankar.

➤ **Khadar:**

- It is the newer and lower alluvial plain that lies along the river banks. It is composed of fine silt and clay. It has a light color and is very fertile. It is renewed every year by the floods.

➤ **Agricultural Significance:**

- The IGP plays a pivotal role in Indian agriculture, **contributing 30% of the country's total food production**.

Note:

- It serves as a primary source of food, including staple cereals like rice and wheat.

➤ **Demographic Significance:**

- This region is one of the most densely populated areas globally, with an estimated **400 million inhabitants**. The population density, especially along the banks of the Ganges, is exceptionally high.

## Fostering Sustainable Agrifood System

### Why in News?

Recently, the Ministry of Agriculture & Farmers Welfare has inaugurated the 16<sup>th</sup> Agricultural Science Congress (ASC) in Kochi, Kerala in order to promote **Sustainability in the Agri-Food System**.

- Organized by the National Academy of Agricultural Sciences (NAAS), the ASC will come out with recommendations that facilitate the agriculture sector for moving towards a path of greater sustainability.

### Note:

- **Agricultural Science Congress (ASC):** The ASC serves as a platform for experts, researchers, practitioners, and stakeholders in the **agricultural and allied sectors** to come together and discuss various critical areas related to agriculture, sustainability, and related subjects.
- **National Academy of Agricultural Sciences (NAAS):** NAAS is a **prestigious organization based in India**, established with the aim of promoting agricultural science and research. The primary objective of NAAS is to provide a forum for agricultural scientists to deliberate on significant issues and advancements in the field of agriculture and related sciences.

### What are Sustainable Agri Food Systems?

- **About:**
- Sustainable agri-food systems encompass a **holistic approach to agricultural production, distribution, consumption, and waste management** that is environmentally sound, socially equitable, and economically viable.
  - These systems aim to **meet current food needs** while ensuring long-term sustainability, minimizing

**negative impacts on the environment**, improving livelihoods, and promoting social well-being.

- In 2020, global agrifood systems **emissions were 16 billion tonnes of carbon dioxide equivalent**, an increase of 9 % since 2000.

➤ **Need for Adopting Sustainability in Agri Food Systems:**

○ **Rising Demand for Food:**

- The increasing **global demand for food necessitates** sustainable agri-food systems to ensure sufficient and consistent food production to meet the needs of a growing population.

○ **Environmental Degradation:**

- Widespread environmental degradation **caused by unsustainable agricultural practices** underlines the urgency to transition to sustainable methods to mitigate further harm to the environment.

○ **Climate Change Challenges:**

- Climate change **poses a significant threat to agriculture**. Sustainable practices are essential to adapt to these challenges and reduce the sector's contribution to climate change.
  - There are several sustainable and climate resistant agricultural practices in India which are recognised by the **GIAHS (Globally Important Agricultural Heritage Systems)**, like **Pokkali rice, Kuttanad below Sea Level Farming System of Kerala etc.**

### How can Sustainability be Adopted in Agri Food Systems?

➤ **Enhanced Technological Interventions:**

- Scientific innovations and advanced technological interventions are pivotal for sustainable agricultural practices, aiding in efficient resource use and reducing negative environmental impacts.

➤ **Genome Editing and Modern Technologies:**

- Genome editing and other modern technologies are highlighted as core tools for technological breakthroughs in agriculture, addressing limitations of traditional breeding methods.

➤ **Carbon-Neutral Agricultural Practices:**

- Transitioning to carbon-neutral agricultural practices can be adopted to mitigate climate impacts, promote environmental sustainability, and contribute to global efforts to reduce carbon emissions.

Note:



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### **What are the Issues in Adopting a Sustainable Agrifood System?**

- **Food Waste and Loss:**
  - A significant portion of food is wasted at various stages of the food supply chain, from production to consumption. Addressing food waste and loss is critical to improving the sustainability of the food system.
- **Climate Change and Environmental Impact:**
  - Agriculture is a major contributor to greenhouse gas emissions, deforestation, water pollution, and soil degradation. Implementing sustainable practices to mitigate these impacts is essential for a sustainable food system.
- **Resource Scarcity:**
  - Depletion of natural resources such as water, arable land, and energy poses a challenge to sustainable food production. Efficient use of resources and adopting sustainable farming practices is crucial.
- **Biodiversity Loss:**
  - Modern agriculture practices often lead to loss of biodiversity, affecting ecosystem services and disrupting natural balances. Promoting biodiversity-friendly farming approaches is vital for a sustainable food system.
- **Monoculture and Crop Diversity:**
  - The dominance of monoculture farming can lead to vulnerability in the food supply. Encouraging crop diversity and sustainable farming systems can enhance resilience and sustainability.

### **What are the Government Initiatives to Promote Agrifood Systems?**

- **Indian Initiatives:**
  - India has created a dedicated **Agriculture Infrastructure Fund** which aims to create farm gate and agriculture marketing infrastructure in rural areas by providing interest subsidies and credit guarantee to entrepreneurs which will greatly help in **reducing the post-harvest losses**.
  - To conserve precious water resources, the Government has launched a scheme to increase water use efficiency at the farm level by using **micro-irrigation technologies for which a dedicated micro-irrigation fund** has been set up.
    - India has developed 262 abiotic stress-tolerant varieties of different crops.

- To address the issues of under-nutrition and malnutrition, India is running the world's largest food-based safety net programmes which include the **Targeted Public Distribution System (TPDS)** that will serve about 800 million people in 2020.
- The UN recognised India's proposal of celebrating the year **2023 as the 'International Year of Millets'**.

## **CBDT Directives on Angel Tax**

### **Why in News?**

The **Central Board of Direct Taxes (CBDT)** has issued a directive aimed at ensuring that **Department for Promotion of Industry and Internal Trade (DPIIT)** recognized **start-ups** are not burdened with **unnecessary scrutiny under the revised angel tax provisions** in the **Finance Act, 2023**.

### **What are the New Tax Directives Related to Start-ups?**

- The CBDT has directed its officers to **refrain from scrutinizing the angel tax provisions for start-ups that have received recognition from the DPIIT**.
  - This directive comes in response to concerns raised by **many start-ups regarding scrutiny notices for angel tax**.
- The CBDT has outlined two scenarios regarding recognized start-ups under scrutiny:
  - **Single-Issue Scrutiny:** In cases where scrutiny is initiated solely to determine the applicability of **Section 56 (2) (viib) of the Income-tax Act**, **Assessing Officers will not conduct any verification during the assessment proceedings**.
    - Instead, the contention of the recognized start-up regarding the issue will be summarily accepted.
  - **Multiple-Issue Scrutiny:** When a recognized start-up is under scrutiny for multiple issues, including the one under **Section 56 (2) (viib) of the Income-tax Act**, the **applicability of the angel tax provision will not be pursued during the assessment proceedings**.

### **What is Angel Tax?**

- Angel tax is an **income tax levied at the rate of 30.6%** when an **unlisted company issues shares to an investor at a price higher than its fair market value**.

Note:



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- **Fair market value** is the price of an asset when buyer and seller have reasonable knowledge of it and are willing to trade without pressure.
- Initially, angel tax was applicable only to investments made by resident investors. The **Finance Act, 2023** extended this provision to include foreign investors as well.
- This means that when a start-up raises funding from a foreign investor, it will also be counted as income and subjected to taxation.
  - However, DPIIT-recognized start-ups are now **excluded from the angel tax levy**.

**Note:** In May 2023, the Finance Ministry exempted investors from 21 countries, such as the **US, UK, and France**, from the angel tax levy for non-resident investments in Indian start-ups.

### **What are the Other Major Government's Initiatives Related to Startups?**

- **National Initiative for Developing and Harnessing Innovations (NIDHI)**
- **Startup India Action Plan (SIAP)**
- **Ranking of States on Support to Startup Ecosystems (RSSSE)**
- **Startup India Seed Fund Scheme (SISFS)**

### **What is the Central Board of Direct Taxes?**

- It operates as a statutory authority established by the **Central Board of Revenue Act, 1963**.
  - It forms an integral component of the **Department of Revenue within the Ministry of Finance**.
- It contributes to the **formulation of policies and planning related to direct taxation in India** and oversees the enforcement of direct tax laws through the Income Tax Department.
  - Direct taxes encompass **income tax, corporation tax**, and similar categories.

## **Foreign Contribution Regulation Act**

### **Why in News?**

Recent data from the Ministry of Home Affairs has revealed a concerning trend related to the **registration**

of **non-governmental organizations (NGOs)** under the **Foreign Contribution (Regulation) Act (FCRA), 2010** in India.

- The data suggests that **NGOs are not accurately depicting their operational areas** in their FCRA registrations and are involved in activities that **deviate from their stated objectives**.

### **What is the Foreign Contribution Regulation Act?**

- **About:**
  - The **FCRA was enacted in 1976** during the **Emergency period** due to concerns about **foreign interference in India's affairs** through financial support to independent organizations.
  - FCRA was **designed to regulate foreign donations** to individuals and associations, ensuring that they operate in a manner consistent with the values of a sovereign democratic republic.
- **Amendments to FCRA:**
  - **2010 Amendment:**
    - Enacted to consolidate the law to regulate the **acceptance and utilization of foreign contribution** by certain individuals or associations and **to prohibit acceptance and utilization** of foreign contribution for any **activities detrimental to the national interest**.
  - **2020 Amendment:**
    - **Prohibiting the transfer of foreign contribution** to any other person or organization.
    - Reducing the limit of usage of foreign **contribution for administrative expenses from 50% to 20%**.
- **FCRA Registration:**
  - Registration under the FCRA is essential for receiving foreign donations in India.
    - It's granted to individuals or associations engaged in **various areas of work**, including **cultural, economic, educational, religious, or social programs**, among others.
    - The FCRA regulates foreign contributions in **these defined areas to ensure transparency and compliance with the law**.
  - Entities can register under **multiple categories based on their programs, allowing for diverse activities**.
  - Applicants need to open a bank account for the receipt of the foreign funds at a specified branch of State Bank of India in New Delhi.

Note:

➤ **Prohibitions of Activities Under FCRA Registration:**

- The applicant must not represent **fictitious entities**.
- The applicant should not have been involved in **religious conversion activities, either directly or indirectly**.
- The applicant should not have a history of prosecutions related to communal tension or disharmony.
- The applicant must not be engaged in activities related to **sedition**.
- The FCRA prohibits candidates, journalists, media companies, judges, government servants, politicians, and political organizations from receiving foreign funds.

➤ **Validity and Renewal:**

- FCRA registration is **valid for five years**, and NGOs are required to apply for **renewal within six months of the registration's expiry**.
- The government has the authority to cancel an NGO's FCRA registration for various reasons, including violations of the Act or a lack of reasonable activity in their chosen field for two consecutive years.
  - Once canceled, an **NGO is ineligible for re-registration for three years**.

➤ **FCRA 2022 Rules:**

- In July 2022, the MHA introduced changes to FCRA rules. These changes included increasing the number of compoundable offences from 7 to 12.
- The rules also raised the limit for contributions from relatives abroad that do not require government intimation from **Rs 1 lakh to Rs 10 lakh and**

**extended the time limit for intimation of the opening of bank accounts.**

***What are the Concerns of NGOs Regarding the FCRA?***

➤ **Strict Compliance:**

- The FCRA registration process demands extensive documentation and involves strict compliance, which can pose challenges for NGOs.
- The FCRA's interpretive ambiguity can be exploited by authorities to target and restrict NGOs.

➤ **Administrative Delays:**

- Lengthy administrative procedures for FCRA registration and renewal delay NGOs' operations and funding access.

➤ **Lack of Transparency:**

- Some NGOs have been criticized for lacking transparency in their utilization of foreign funds received under the FCRA.
  - Concerns often arise when the **specific purposes and beneficiaries of these funds are not clearly disclosed**.

➤ **Uneven Access to Funding:**

- The complex FCRA registration process poses challenges for **organizations, with high denial rates** affecting their ability to receive foreign contributions.

➤ **Potential for Political Influence:**

- Some have raised concerns about **political influence in the FCRA registration** and regulation process, which may impact the approval or denial of FCRA registrations.



Note:

# International Relations

## Highlights

- *Regional Comprehensive Economic Partnership*
- *Israel-Hamas Conflict and its Global Impact*
- *Former Navy Personnel Sentenced to Death in Qatar*
- *Vienna Convention on Diplomatic Relations*
- *India's Balancing Act in Israel-Palestine War*
- *Rafah Crossing*
- *China's Aid to Sri Lanka*
- *China's Belt and Road Initiative*
- *UN Approved Multinational Security Mission in Haiti*
- *Gandhi's Stance on Jewish Nation-State in Palestine*

## Regional Comprehensive Economic Partnership

### Why in News?

Four years after India's exit, neighboring nations **Sri Lanka and Bangladesh** are considering joining the **Regional Comprehensive Economic Partnership (RCEP)**.



Note:

## What is a Regional Comprehensive Economic Partnership?

- **About:**
  - The RCEP is a significant economic agreement between ASEAN members and Free Trade Agreement (FTA) partners.
  - RCEP is the **world's largest trading bloc**. It is designed to promote **economic integration, trade liberalization, and cooperation among member nations**.
  - The **RCEP negotiations began in 2012**. It was officially **signed in November 2020**, marking a major milestone in regional trade. It was entered into force on January 1, 2022.
- **Member Countries:**
  - 15 member countries, such as China, Japan, New Zealand, South Korea, Australia, and **ASEAN nations** (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam).
- **Coverage Areas:**
  - The RCEP negotiation includes: trade in goods, trade in services, investment, economic and technical cooperation, **intellectual property, competition, dispute settlement, e-commerce, small and medium enterprises (SMEs)** and other issues.
- **Objectives of RCEP:**
  - Facilitate trade and investment among member nations.
  - **Reduce or eliminate tariffs and non-tariff barriers** to trade.
  - Enhance **economic cooperation and regional supply chains**.
- **Benefits of RCEP:**
  - Promotes **economic growth and regional stability**.
  - Streamlines trade procedures and regulations.
  - Encourages **foreign investment**.
  - Enhances competitiveness and innovation.
- **Trade Volume:**
  - RCEP member nations represent **over 30% of the global Gross Domestic Product (GDP)**.
  - The trading bloc covers about **one-third of the world's population**.
  - It has the potential to significantly impact global trade.

## ➤ RCEP's Role in Global Trade:

- RCEP strengthens the influence of the **Asia-Pacific region in international trade**.
- The agreement can serve as a model for future trade deals and regional cooperation.

## ➤ India and RCEP:

- India was a founding member of the RCEP. In **2019, India decided to withdraw from the RCEP negotiations**.
- India's decision to exit the RCEP was based on **concerns about the impact on its domestic economy**.
  - Primary concerns included fears of an **influx of Chinese goods into the Indian market**, affecting local industries.
  - Issues related to mobility in services and reservations from the agriculture sector and small businesses were contributing factors.

## Israel-Hamas Conflict and its Global Impact

### Why in News?

The ongoing **Israel-Hamas conflict** has escalated due to Israel's **ground offensive in the Gaza Strip**, to eliminate **Hamas**. This has raised concerns about the post-conflict phase and its potential **impact on the global economy**.

- Bloomberg, a global media company has outlined three scenarios for the conflict and how each could affect countries around the world.

### What are the Three Possible Scenarios for the Conflict and their Potential Effects?

#### ➤ Limited Conflict in Gaza:

- In this scenario, the conflict remains primarily **localized in the Gaza Strip**, with limited expansion into other regions.

#### ○ Potential Effects:

- Limited direct impact on the global economy. Nevertheless, this is unwelcome news for a world economy recovering from **various setbacks**, as central banks struggle between **addressing inflation** and **preventing economic slowdowns**.

Note:



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- The conflict can result in an increasing humanitarian crisis in Gaza, marked by significant casualties, with the death toll already surpassing 8,000.
- **Regional Conflict with Iran-backed Militants:**
  - This scenario involves a broader regional conflict, with the potential involvement of **Iran-backed militant groups in Lebanon and Syria**, as well as the **Houthis** in Yemen.
- **Potential Effects:**
  - This could lead to escalation of violence in multiple regional locations, leading to increased instability and conflict..
  - Oil prices could rise to around the mid-USD 90s, higher than the current USD 90 per barrel,
  - Higher inflation rates globally, potentially denting global economic growth by 0.3% points.
- **Full-scale War Involving Israel, Iran, and Major Powers:**
  - The most extreme scenario envisions a full-scale war between regional powers Israel and Iran, with the possible involvement of major world powers such as the United States, China, and Russia.
- **Potential Effects:**
  - The conflict could disrupt **trade and global crude oil supply** in the Middle East, affecting countries in the region and their trading partners.
    - Over 20% of the world's crude supply comes from West Asia, conflict in the region may drastically push up the **Crude oil prices up to USD 150 per barrel**.
    - Even with potential capacity from Saudi Arabia and the UAE, if they do not align with Iran, oil shipments may still face challenges in passing through the **Strait of Hormuz**, a 48-kilometer shipping chokepoint through which nearly **one-fifth of the world's total oil production transits**.
  - **Global inflation could rise to about 6.7% in 2024**, potentially causing **global economic growth to slow by almost 2% points** and leading to a possible worldwide recession with significant implications for countries like **India and the US**.

### Hamas

#### ➤ About:

- Hamas is a **Palestinian political armed group that was founded in 1987**. It's a militant group that emerged as a resistance movement against Israeli occupation.

#### ➤ History:

- Hamas was created in 1987 as an offshoot of Egypt's Muslim Brotherhood seeking to fulfill its agenda through **violent jihad**.
  - It gained popularity as a resistance movement against Israeli occupation and Fatah.
- The United States has designated **Hamas a terror organization** since 1997. Many other countries, including Israel and most of Europe, see it the same way.

#### ➤ Ideology:

- Hamas believes that no part of the land of Palestine shall be compromised or conceded.
- Hamas rejects any alternative to the complete liberation of Palestine.

## Former Navy Personnel Sentenced to Death in Qatar

### Why in News?

Recently, a Qatari court has sentenced eight former personnel of the **Indian Navy** to death in the Espionage Charges.

- The individuals were arrested in August 2022 and faced **charges related to breaching sensitive secrets**.



Note:

### What is the Background of the Case?

#### ➤ Accusations:

- The accused individuals, while employed by **Al Dahra in Doha**, were allegedly accused of breaching sensitive secrets at the time of their arrest in 2022 in Qatar.

- Dahra Global Technologies and Consultant Services, the company they worked for, was also linked to the production of **advanced Italian-origin submarines known for their stealth capabilities**.
- However the specific charges against the eight Indian nationals have not been made public by **Qatari authorities**.

### Case History

In August 2022, eight Indian nationals – all retired Indian Navy personnel – were arrested by Qatari intelligence

Capt **Navtej Singh Gill**, Capt **Birendra Kumar Verma**, Capt **Saurabh Vasisht**, Cdr **Amit Nagpal**, Cdr **Purnendu Tiwari**, Cdr **Sugunakar Pakala**, Cdr **Sanjeev Gupta**, Sailor **Ragesh** were working for Al Dahra company

**Before taking** up jobs at Al Dahra, all had retired from Indian Navy several years ago

Initially, they were kept in solitary confinement without clear charges

**They were charged with spying in Qatar on behalf of Israel**

**Al Dahra** was shut down after the arrests

**Reports said the personnel were working on a project to develop small, stealth submarines for the Qatar Navy**

India had secured consular access to the accused and provided legal assistance

**Trial started** in March this year

**Qatari court** of first instance has pronounced them guilty and awarded death sentence

India is '**deeply shocked**' at the verdict and 'exploring legal options'



#### ➤ Previous Trials:

- The case has seen two trials in March and June of 2023. While the detainees were granted consular access on multiple occasions, both Indian and Qatari authorities **have maintained a veil of secrecy around the case**, citing its sensitivity.

#### ➤ India's Reaction:

- India has expressed deep shock and concern over the death sentences imposed on its citizens and is exploring all possible legal options to secure their release.
- The **Ministry of External Affairs (MEA)** has conveyed the high importance attached to this case and **reiterated its commitment to providing consular and legal assistance** to the detained individuals.

their sincerity, hard work, technical expertise and law-abiding nature.

- The remittances which the Indian expatriate community in Qatar send to India are estimated to be around 750 million dollar per annum.

#### ➤ This case represents the **first major crisis in the India-Qatar relationship**, which has generally been stable.

- The two nations have engaged in high-level meetings, with the Prime Minister of India visiting Doha in 2016, followed by **meetings with the Emir of Qatar**.

#### ➤ Qatar is a significant supplier of liquefied natural gas (LNG) to India, **accounting for a substantial portion of India's LNG imports**.

### What are the Options

#### India has to Prevent these Navy Personnels?

#### ➤ Diplomatic Options:

- India can engage in direct diplomatic negotiations with the Qatari government to seek a resolution to the case. Given the strategic and economic importance of the relationship between the two countries, **diplomatic leverage can play a significant role**.
- The government can also use diplomatic pressure to prevent meting out the death penalty.
- Among the possibilities being looked at is filing an appeal against the verdict or using an **agreement**

### What are the

#### Diplomatic Implications of this Case?

- The verdict could potentially strain relations between India and Qatar, where a significant number of **Indian migrants contribute to fostering economic and diplomatic ties**.
- With over seven lakh Indians in Qatar, the Indian government is under pressure to act at the **highest level to save the lives of the detainees**.
- They are making their contribution in different sectors. Indians are highly respected in Qatar for

Note:



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signed by India and Qatar in 2015 for the transfer of convicted prisoners so that they can complete their sentence in their home country.

- NGOs and civil society can raise the issue at a global level, and pressure from the United Nations can be taken too.

➤ **Legal Options:**

- The first step is to **appeal within the judicial system in Qatar**. The individuals sentenced to death can file appeals within the Qatari legal system.
  - India can provide **legal representation to the detainees and ensure that their right to appeal** is pursued vigorously.
- If due procedures are not followed or an appeal process is missing, then India can **invoke International Court of Justice (ICJ) jurisdiction**.
  - ICJ acts as a world court **with two fold jurisdiction i.e.** legal disputes between States submitted to it by them (contentious cases) and requests for advisory opinions on legal questions referred to it by United Nations organs and specialized agencies (advisory proceedings).

**In What Cases was India Involved with the ICJ?**

- Kulbhushan Jadhav Case (India Vs Pakistan)
- Right of Passage over Indian Territory (Portugal v. India, culminated 1960).
- Appeal Relating to the Jurisdiction of the ICAO Council (India v. Pakistan, culminated 1972).
- Trial of Pakistani Prisoners of War (Pakistan v. India, culminated 1973).
- Aerial Incident of 10 August 1999 (Pakistan v. India, culminated 2000).
- Obligations concerning Negotiations relating to Cessation of the Nuclear Arms Race and to Nuclear Disarmament (Marshall Islands v. India, culminated 2016).

## Vienna Convention on Diplomatic Relations

### Why in News?

Recently, in response to the allegations raised by the **Canadian Foreign Minister** regarding India's purported violation of diplomatic protocols, the **Indian Ministry of**

**External Affairs (MEA)** emphasized that India's actions are consistent with the provisions outlined in **Article 11.1 of the Vienna Convention on Diplomatic Relations**.

### What is the Vienna Convention on Diplomatic Relations?

➤ **About:**

- The **Vienna Convention on Diplomatic Relations (1961)** is established to **define fundamental principles** and terms governing how countries must treat each other's diplomatic representatives.
  - It was adopted on **14<sup>th</sup> April 1961** by the **United Nations Conference on Diplomatic Intercourse and Immunities** held at the **Neue Hofburg in Vienna, Austria**.
- It aims to foster friendly relations and maintain effective communication channels between nations.
- Today, **193** countries have ratified the convention.
  - India ratified it through the **Diplomatic Relations (Vienna Convention) Act of 1972**.

➤ **Major Provisions:**

- A key principle of the Convention is **diplomatic immunity**. It grants **diplomats exemption** from certain laws and taxes in the host country where they are posted. It ensures that diplomats can fulfill their duties **without fear, threat, or intimidation**.
  - **According to Article 29 of the Convention, diplomats** are not subject to arrest or detention. The host country must **accord the diplomatic agent the appropriate level of respect** and is responsible for undertaking all necessary measures to prevent any form of harm or violation to the **diplomat's person, liberty, or dignity**.
- **Article 11.1** of the Convention **empowers the host country to establish reasonable and appropriate limits** on the **size of a foreign diplomatic mission**, taking into consideration the prevailing conditions and circumstances in the host nation, as well as the unique requirements of the particular diplomatic mission.
- **Article 9** of the Convention **allows the receiving State to declare the head of the mission or any member of the diplomatic staff persona non grata** or unwelcome **without the need for an explanation**, and this notification can be made at any time.

Note:



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# India's Balancing Act in Israel-Palestine War

## Why in News?

India's diplomatic stance on the **Israel-Palestine conflict** has evolved over the years, reflecting a delicate balance between its **historical support for Palestine** and its **growing relationship with Israel**.



## How has been India's Policy over the Israel-Palestine Conflict?

### ➤ Background:

- India's **historical stance on the Israel-Palestine conflict** leaned towards Palestine, driven by factors such as **Mahatma Gandhi's opposition to a Jewish state in Palestine**, India's large Muslim population, and the **need to maintain good relations with Arab countries**.

- India's position with regard to Palestine was also guided by the general consensus in the Arab world, the Non-Aligned Movement, and the United Nations.

- When the partition of Palestine plan was put to vote at the UN, **India voted against, along with the Arab countries**. India also opposed Israel's admission to the UN.

- During the **Cold War**, India aligned **itself with the Soviet Union**, which supported the Arab states, thus **perpetuating its pro-Palestine position**.

### ➤ Shift in India's Policy:

- **Establishment of Diplomatic Relations:** In 1992, India established full **diplomatic relations with Israel**, marking a significant shift. Despite this, India continued to **voice support for the Palestinian cause**.

- It was only after the end of the Cold War that Prime Minister Narasimha Rao took the bold step of **establishing diplomatic ties with Israel, irrespective of potential fallout with the Arab nations**.

- **Balance in National Interest:** India's diplomatic decisions are guided by **national interest**, necessitating a balance between maintaining strong relations with Israel, supporting Palestine, and **developing ties with the Arab world**.

## What are the Current Policy and Diplomatic Nuances?

### ➤ Relations with Israel as a National Interest:

- India's relations with Israel have strengthened considerably in recent years, encompassing **various sectors like trade, technology, defense, and counter-terrorism cooperation**.
- India's support for Israel is seen as a response to its **fight against cross-border terrorism**, although the situations in Israel and India differ significantly.

### ➤ Stands With Palestine's Cause:

- Besides growing relations with Israel, India has reiterated its stand for Palestine's cause.
  - Amid the ongoing tensions, USD 29.53 million has been contributed by India to the **UN Relief and Works Agency (UNRWA)** for Palestinian refugees.
- India also sent nearly 6.5 tonnes of medical aid and 32 tonnes of disaster relief material for the **people of Palestine**.

Note:



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➤ **India Balancing its Stance:**

- In 2017, the Indian Prime Minister for the first time visited Israel and in 2018 he made an official visit to Palestine for the first time.
- In 2017, India voted **against the U.S. and Israel for an attempt to declare unilaterally all of Jerusalem as the Israeli capital.**
- India's policy is clear, they condemn **terrorism but do not support indiscriminate reprisal bombings.**

➤ **India's Official Stand:**

- India's official position on the Israel-Palestine conflict remains unchanged, advocating for a **two-state solution with Israel and Palestine** as good neighbors.
  - It was only after the mediation of the US, in the **1991 Madrid Peace conference** a two-state solution was agreed to **resolve the Israeli-Palestinian conflict.**
- This is evidenced by the Indian Prime Minister's visit to **Ramallah in the West Bank in 2018.**

**What will be the Likely Implications of Israel Palestine Conflict on India?**➤ **Defense Deals with Israel:**

- India has a significant defense relationship with Israel, with defense procurement and technology cooperation. The conflict may **impact this relationship, as Israel may focus more on its security needs** during the conflict.
- Israel supplies the most military equipment to India, with the military business between the two countries worth around USD 2.1 billion.

➤ **Energy Security:**

- India is **dependent on oil imports from the Middle East**, and any escalation in the region could affect energy prices and, subsequently, India's economy.
- Since all the world economies are interconnected therefore, if countries like Saudi Arabia and Iran get involved in ongoing Israel-Palestine conflict then definitely there will be **direct consequences over India's energy supply**, economy and investment.

➤ **Impact on India-Middle East-Europe Economic Corridor:**

- The conflict has the potential to affect the stability of the Middle East, a region of strategic importance to India.

- An escalation of hostilities could have implications for India's interests and engagements in the region.
  - India recently signed the **India-Middle East-Europe Economic Corridor (IMEC)** as an ambitious infrastructure project aimed at connecting India, the Middle East, and Europe through various transportation modes, including shipping and rail networks.
  - Instability in the region can create security challenges, and affect the smooth operation of the IMEC.

## Rafah Crossing

### Why in News?

The **Rafah border crossing** in southern **Gaza** has gained global attention as **Palestinians** are attempting to leave Gaza in anticipation of a possible Israeli attack as part of the ongoing **Israeli-Palestinian conflict.**



### What is Rafah Crossing?

➤ **About:**

- The Rafah crossing is the **southernmost exit point from the Gaza Strip**, and it shares a border with **Egypt's Sinai Peninsula.**
  - The crossing is controlled by Egypt.

Note:

- It is the **only exit that does not lead to Israeli territory**.
- There are only two other border crossings in and out of Gaza:
  - **Erez** is located in the north and is used by people in Israel.
  - **Kerem Shalom**, in the south, which is **exclusively for commercial goods**.
    - **Both Erez and Kerem Shalom controlled by Israel** are currently closed.

➤ **Importance:**

- The Rafah crossing gained heightened importance after **Hamas's assault on the Erez crossing**, resulting in over 1,300 casualties in southern Israel.
- In response, Israel closed both Erez and Kerem Shalom indefinitely, leaving the **Rafah border as the sole means of entry and exit for Gaza's people and the only crossing for humanitarian aid**.

#### Egypt's Sinai Peninsula

- The Sinai Peninsula is a triangle-shaped peninsula in Egypt. It's located in the northeastern part of the country.
- The peninsula is bordered by the **Mediterranean Sea to the north, the Red Sea to the south, and the Gulf of Aqaba to the east**.
- The peninsula includes the **Suez Canal, which is a man-made waterway** that connects the Mediterranean Sea to the Red Sea.



## China's Aid to Sri Lanka

### Why in News?

More than a year after Sri Lanka plunged into an economic crisis, it has reached an agreement with the Export-Import (EXIM) Bank of China to cover about USD 4.2 billion of its outstanding debt.

- For India, China's assistance to Sri Lanka will be seen as another means through which it is investing in deepening its ties with the island nation.

### What is the Context

#### of China's Present Aid to Sri Lanka ?

##### ➤ Sri Lanka's Economic Crisis Causes and Response:

- In April 2022, Sri Lanka declared its inability to repay its debt of over **USD 83 billion**, with more than half owed to foreign creditors.
- Factors contributing to the crisis include **large tax cuts in 2019, the impact of the coronavirus pandemic on the tourism industry, and fuel shortages due to the war in Ukraine**.
- Sri Lanka sought assistance from China and India, where India extended **USD 500 million credit line for fuel and a USD 1 billion credit line for importing essentials**.

##### ➤ Concerns and Challenges in Debt Negotiations:

- Sri Lanka initiated negotiations with bondholders and key bilateral creditors, **including China, Japan, and India, to meet IMF conditions**.
- Sri Lanka received a **USD 2.9 billion IMF Extended Fund Facility**, but had to secure financing assurances for debt sustainability from its creditors through debt restructuring.
  - For instance, Sri Lanka asked foreign investors for a 30% reduction in outstanding debt and hopes to reduce its overall debt by USD 16.9 billion.
- The **Paris Group** attempted to bring China and India into negotiations as a whole, ensuring no nation receives preferential terms.
- China has traditionally pursued bilateral negotiations with confidential terms, while **India had concerns about joining a common platform that does not include China** as it may have implications for military and strategic interests in the **Indian Ocean Region**.

Note:



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## How Strong are China-Sri Lanka Ties?

- **Largest Creditor to Sri Lanka:**
  - China is the **largest bilateral creditor** to the country.
  - Sri Lanka heavily relies on Chinese credit to address its foreign debt burden.
  - **Investment in Infrastructure Projects:**
    - China has invested about USD 12 billion in Sri Lanka's infrastructure projects between 2006-19.
- **China's Pursuit in the Indian Ocean:**
  - China enjoys friendlier waters in South Asia and the Indian Ocean than it does in Southeast Asia and the Pacific.
  - China faces opposition from Taiwan, territorial disputes in the **South China Sea** and East Asia, and myriad frictions with the US and Australia.
  - **Shifting Interests of Smaller Nations:**
    - Sri Lanka's economic crisis may further push it to align its policies with China's interests.
- **India's Concerns:**
  - **Opposition to SAGAR Initiative:** The Chinese-proposed "Forum on the Development of Indian Ocean Island Countries" sounded in opposition to India's **SAGAR (Security and Growth for All in the Region) initiative**.
  - **Issues Emanating from Two Engines of Growth:** China has formal control over Sri Lanka's **Hambantota port as a part of a 99-year lease**.
    - Sri Lanka has decided to establish a Special Economic Zone around the Colombo port city and a new economic commission, to be funded by China.
    - Leasing of Hambantota and the Colombo Port City project makes it almost certain for the Chinese navy to have a permanent presence in the Indian Ocean **which will be worrisome for India's national security**.
    - This Chinese strategy to encircle India is referred to as the **Strings of Pearls Strategy**.
  - **Influencing India's Neighbours:** Other South Asian nations like Bangladesh, Nepal and the Maldives have also been turning to China to finance large-scale infrastructure projects.



## How have Relations Between India and Sri Lanka Been?

- **Historical Ties:** India and Sri Lanka have a long history of cultural, religious, and trade ties dating back to ancient times.
  - There are strong cultural ties between the two countries, with many Sri Lankans tracing their heritage to India. **Buddhism, which originated in India, is also an important religion in Sri Lanka.**
- **Financial Assistance from India:** India provided approximately **USD 4 billion worth** of aid to Sri Lanka during an unprecedented economic crisis, which was crucial for the country to survive the crisis.
  - **India became the first country** to hand over its letter of support for financing and debt restructuring of Sri Lanka.
- **Regional and Indian Ocean Context:** Both countries are significant **Indian Ocean** countries, and their relations are viewed in the broader regional and Indian Ocean context.
- **Economic and Technology Cooperation Agreement (ETCA):** Both countries are exploring the possibility of an **ETCA** to integrate their economies and foster development.
- **Agreement on a Multi-Project Petroleum Pipeline:** Both India and Sri Lanka have agreed to establish a multi-product petroleum pipeline from the southern part of India to Sri Lanka.
- **Adoption of India's UPI:** Sri Lanka has now adopted India's UPI service, which is a significant step towards enhancing fintech connectivity between the two countries.
  - The **use of rupee for trade settlement** is further helping Sri Lanka's economy. These are concrete steps to help Sri Lanka's economic recovery and growth.

Note:

- **Economic Ties:** India is **Sri Lanka's third largest export destination**, after the US and UK. More than 60% of Sri Lanka's exports enjoy the benefits of the **India-Sri Lanka Free Trade Agreement**. India is also a major investor in Sri Lanka.
- **Defence:** India and Sri Lanka conduct joint military (**Mitra Shakti**) and Naval exercise (**SLINEX**).
- **Participation in Groupings:** Sri Lanka is also a member of groupings like **BIMSTEC** (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) and **SAARC** in which India plays a leading role.

**Note:** The Indian Prime Minister and Sri Lankan President recently resumed the **ferry service**, nearly four decades after it was **canceled due to the Civil war in Sri Lanka**.

- The ferry links **Nagapattinam in Tamil Nadu (India) to Kankesanthurai in Sri Lanka's Jaffna**, aiming to bring both nations closer through enhanced connectivity and shared cultural and historical ties.
- It will cover the **60-nautical mile journey in approximately 3.5 hours**.

## China's Belt and Road Initiative

### Why in News?

China's ambitious **Belt and Road Initiative (BRI)** is celebrating its 10<sup>th</sup> anniversary. This colossal project, in 2013, aims to reshape global trade and infrastructure development.



Note:



### What is the Belt and Road Initiative?

#### ➤ About:

- The BRI, represents a **multifaceted development strategy** aimed at enhancing **global connectivity and cooperation**.
- It was launched in 2013 and aims to link Southeast Asia, Central Asia, the Gulf region, Africa and Europe with a network of land and sea routes.
  - The project was first named the **'One Belt, One Road'** but renamed as the BRI to convey a more open and inclusive initiative as opposed to a Chinese-dominated one.
- The initiative includes two principal components: the **Silk Road Economic Belt** and the **Maritime Silk Road**.

#### ➤ Routes of BRI:

##### ○ Silk Road Economic Belt:

- This segment of the BRI is dedicated to improving connectivity, infrastructure, and **trade links across Eurasia** through a network of **overland transportation routes**.

##### ○ Maritime Silk Road:

- This component emphasizes **maritime connections and cooperation** in the form of ports, shipping routes, and maritime infrastructure projects.
  - It begins via the **South China Sea** going towards **Indo-China, South-East Asia** and then around the **Indian Ocean** thus reaching Africa and Europe.

#### ➤ Objective:

- The primary goal of the BRI is to **boost international connectivity** by enhancing infrastructure, trade, and economic cooperation.
  - The initiative encompasses a wide range of projects, including railways, ports, highways, and energy infrastructure.

#### ➤ Geographic Corridors:

- The land-based Silk Road Economic Belt envisions six key corridors for development:
  - **China-Pakistan Economic Corridor (CPEC).**
  - **New Eurasian Land Bridge Economic Corridor.**
  - **China-Indochina Peninsula Economic Corridor.**
  - **China-Mongolia-Russia Economic Corridor.**
  - **China-Central Asia-West Asia Economic Corridor.**
  - **China-Myanmar Economic Corridor.**

**Note:** Initially BRI included the Bangladesh-China-India-Myanmar (BCIM) Economic Corridor. Later India refrained from joining the BRI, voicing its opposition to the CPEC that runs from Xinjiang in China's west, through **Pakistan-occupied Kashmir (PoK)**, to the Arabian Sea port of Gwadar. With India staying out, the BCIM corridor has also stalled, and has been replaced by a later launched China-Myanmar Economic Corridor.

#### ➤ Economic Impact:

- Countries participating in the BRI have witnessed growth in trade and investments with China, leading to preferential treatment and policy benefits.
- Trade with BRI partners registered an annual **growth rate of 6.4%, reaching USD 19.1 trillion between 2013 and 2022.**

### What is India's Stance on BRI?

- India opposes the project on the grounds of **sovereignty and transparency**. India has boycotted the BRI summits held by China in 2017, and 2019 and has not endorsed the BRI joint statements issued by the **Shanghai Cooperation Organisation (SCO)**.
  - India's main objection to the BRI is that it includes the **China-Pakistan Economic Corridor (CPEC)**, which passes through the **Pakistan-occupied Kashmir (PoK)**, a territory that India claims as its own.
- India also argues that the BRI projects should respect the international norms, rule of law, and financial sustainability, and should not create debt traps or environmental and social risks for the host countries.
- India has instead promoted other connectivity initiatives, such as the **Partnership for Global Infrastructure and Investment (PGII)**, a **G7** initiative to fund infrastructure projects in developing countries.

### What are the Issues Concerned with the BRI?

#### ➤ Debt Burden:

- The **debt sustainability and transparency of the BRI projects**, especially in countries with weak governance, high corruption, and low credit ratings.
  - Some critics have accused China of engaging in **"debt-trap diplomacy"** by lending money to countries such as Sri Lanka and Zambia that ultimately find themselves unable to repay and then seizing their strategic assets or extracting political concessions in return.

Note:



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### ➤ **Multilateral Governance:**

- The BRI is not a multilateral initiative but rather a **collection of mostly bilateral projects**. This decentralized approach can lead to coordination and governance challenges.
  - Unlike initiatives like the **Asian Infrastructure Investment Bank (AIIB)**, the BRI lacks a centralized governing structure, making it difficult to address issues collectively.

### ➤ **Political Tensions:**

- Geopolitical rivalries and disputes, such as the **India-China border dispute**, have affected the implementation of BRI projects in certain regions. These political tensions can undermine the initiative's progress.

### ➤ **Environmental and Social Concerns:**

- Infrastructure development projects under the BRI have faced **criticism for their potential environmental and social impacts**. Ensuring that BRI projects are **environmentally sustainable** and consider the well-being of local communities is a challenge.

### ➤ **Geostrategic Concerns:**

- The BRI has raised geopolitical concerns, particularly regarding **China's growing influence and control over critical infrastructure in partner countries**. These concerns have led some countries to reevaluate their participation in the initiative.

## **UN Approved Multinational Security Mission in Haiti**

### **Why in News?**

Recently, the **United Nations Security Council (UNSC)** has approved the **Multinational Security Mission (MSS)**, led by **Kenya**, to restore security, protect critical infrastructure and control spiraling violence in **Haiti**.

### **Why is the UN Sending a Multinational Security Mission to Haiti?**

#### ➤ **Haiti's Plea for Urgent Help:**

- Haiti faced escalating gang violence, causing chaos and suffering throughout the country. A group of gangs known as **"G9 and Family"** disrupted the

main fuel port and the Capital city **Port-au-Prince**, leading to a nationwide crisis.

- This has resulted in widespread killings of **nearly 2,800 people**, between **October 2022 and June 2023**.
- Human rights groups have reported a rise in sexual violence and crimes against women. In addition to this, mass looting and burning of houses have led to the displacement of thousands of people, with around 200,000 fleeing their homes. As per estimates, **almost half the population is in need of humanitarian assistance**.

- The Haitian Prime Minister reached out to the international community, seeking specialized armed forces to counter the gangs and their backers.

#### ➤ **Multinational Security Mission:**

- Unlike the Previous **UN peacekeeping mission** in Haiti that concluded in 2017, this new MSS will **not be operated by the United Nations**.
  - **Kenya has volunteered to lead the force**, with support from other countries like the Bahamas, Jamaica, and Antigua and Barbuda.

#### ➤ **Role and Responsibilities:**

- The mission aims to **provide operational support to the Haitian National Police**, enhance security conditions, protect vital infrastructure, and facilitate the conduct of elections.
- The force will have the authority to make arrests in coordination with Haitian police.

### **Haiti**

- It is located between the **Caribbean Sea** and the **North Atlantic Ocean**, Haiti occupies the western one-third of the island of Hispaniola.
  - The **Dominican Republic borders Haiti on the eastern side** of the island. Haiti's neighbours include **Jamaica to the west and Cuba to the northwest**.
- **Official Languages:** French, Haitian Creole.
- **Major Mountain Ranges:** Massif de la Selle, Massif du Nord.
- It is the **world's first independent Black-led republic**.
- The nation underwent about two centuries of Spanish colonial rule and more than a century of French rule.

Note:



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## Gandhi's Stance on Jewish Nation-State in Palestine

### Why in News?

The opposition of **Mahatma Gandhi** to a **Jewish nation-state in Palestine** has gained renewed attention because of ongoing conflict and tensions between **Israel and Palestine**.

### Why did Gandhi Oppose a Jewish Nation-State in Palestine?

- **The Plight of the Jewish People in Europe:**
  - In the 1930s and 1940s, the **Jewish people in Europe** faced **extreme persecution and discrimination**, particularly under the **Nazi regime** led by Adolf Hitler.
    - The Nazis systematically implemented the Holocaust, resulting in the **tragic loss of approximately six million Jewish lives**, along with numerous other atrocities such as concentration camps, and mass **deportations**.
- **Gandhi's Sympathy for the Jewish People:**
  - Gandhi had immense sympathy for the Jewish people who had been historically persecuted for their religion.
    - He drew parallels between the treatment of Jews in Europe and **that of untouchables in India**, emphasizing the **inhumane treatment meted out to both communities**.

- Gandhi was deeply concerned about the German persecution of Jews and believed that even a war with Germany would be justified to prevent such persecution.

### ➤ The Zionist Movement and Its Goals:

- The Zionist movement emerged in the late 19<sup>th</sup> century, with a goal to establish a **national homeland for Jewish people in Palestine**.
- Its momentum increased significantly after **World War I**, encouraged by the **Balfour Declaration of 1917**, which expressed **support for a Jewish national home in Palestine**.
- After **World War II**, in 1947, the **United Nations** proposed a partition plan that would divide **Palestine into separate Jewish and Arab states**, with Jerusalem as an international city.
  - The plan was accepted by the Jewish leaders but rejected by Arab leaders, leading to violence.
  - Israel was officially declared an independent state on May 14, 1948.

### ➤ Gandhi's Opposition to a Jewish Nation-State:

- Gandhi opposed a Jewish nation-state in Palestine, deeming it **wrong and inhumane**. He believed it would be a **crime against humanity** to displace the **native Arab population** for the establishment of a Jewish homeland.
  - Gandhi felt that the Jews could settle in Palestine only **"with the goodwill of Arabs"**, and for that, they had to **"forgo the British bayonet"**.
  - He believed that any religious act, such as **Jews returning to Palestine**, should not be enforced with the bayonet or bomb but should occur with the goodwill of Arabs.
- Gandhi believed that the concept of a Jewish homeland in Palestine contradicted the fight for Jewish rights worldwide. He questioned whether **Jews, who had already settled in various parts of the world, would welcome the idea of being forced to leave those other regions if Palestine was their sole home**.

### How did Gandhi's Stance Influence India's Israel-Palestine Policy?

- Gandhi's opinions and his own anti-imperialism had a profound impact on **Jawaharlal Nehru**, India's **first Prime Minister**, and was responsible for shaping the nascent **country's foreign policy for decades**, leading to India's vote against **UN Resolution 181** partitioning Palestine.

Note:



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- India recognized the state of Israel in 1950 but established official diplomatic relations in 1992, under Prime Minister P V Narasimha Rao.
- India was among the first non-Arab nations to acknowledge the **Palestine Liberation Organization (PLO)** as the sole Palestinian representative. In 1988, India recognized Palestine as a state.
- However, India's policy also underwent some changes over time, reflecting its strategic and economic interests.
  - Recently, India has shifted towards a **dehyphenation policy**, balancing its relationships with both Israel and Palestine, with a preference for a **Two-State Solution** and the right to self-determination for both nations in a peaceful manner.

# ISRAEL-PALESTINE CONFLICT

*The Israel-Palestine conflict is a long-standing geopolitical dispute over territory and self-determination in the Middle East.*

## BEGINNING

- 📌 UN adopted **Resolution 181** – the Partition Plan in 1947
- 📌 State of Israel created in 1948, sparking the **first Arab-Israeli War** (Israel won)
  - Palestinians displaced
  - Division of territory into – State of Israel, West Bank and Gaza Strip

## INITIAL TENSIONS AND CONFLICTS (1956-1979)

- 📌 **Suez Crisis** and Israeli **invasion of Sinai Peninsula** in 1956
- 📌 **Six-Day War (1967)** – Israel gained control over Sinai Peninsula, Gaza Strip, West Bank, East Jerusalem and Golan Heights

### Controversy over Jerusalem as Capital

- **Israel view:** Complete and united Jerusalem
- **Palestinians view:** East Jerusalem future capital

- 📌 **Yom Kippur War (1973)** – Surprise attack by Egypt and Syria
- 📌 **Camp David Accords (1979)** b/w Egypt and Israel

### Intifada (Arabic for 'shake off')

- **First Intifada** – 1987 to 1993
  - ◆ Led to the foundation of Hamas (1987) – a Palestinian political party designated as a foreign terrorist org by US
  - ◆ Response – **Madrid Conference 1991** (chaired by the US and Russia)
- **Second Intifada** – 2000-2005
- The latest escalation (2023) is being called the beginning of "Third Intifada"

## OSLO ACCORDS (MEDIATED BY US)

- 📌 **First (1993)**
  - Estd framework for **Palestinian self-governance** in West Bank and Gaza
  - Enabled mutual recognition between Israel and Palestine

## Second (1995)

- Expanded on Oslo I Accords
- Mandated **complete Israeli withdrawal** from several cities and towns in **West Bank**

## POST 2000 CONFLICT AND RESPONSES

- 📌 **2013** – US-led peace process began
- 📌 **2014-18** – Gaza Conflict (2014)
  - Palestine announced break from territorial divisions under Oslo Accords (2015)
- 📌 **2018-20** – US Cancelled funding for Palestinian refugees under UN Relief and Works Agency (UNRWA)
  - US proposed **"Peace to Prosperity"** plan
- 📌 **2020** – **Abraham Accords**
- 📌 **2022-2023:**
  - Israel raids on **Jenin refugee camp**
  - Hamas launched **"Operation AL-Aqsa Flood"** and Israel launched **"Operation Iron Swords"** (both in 2023)
    - ◆ Israel declared a **State of War**
  - **India's Stand:**
    - ◆ Supports a **Two State solution** for Israel and Palestine
    - ◆ **Condemned the recent attack** by Hamas on Israel





# Social Issues

## Highlights

- Avian Influenza
- Dengue
- Cancer Cases and Cure in India
- Palliative Care
- Disabled Population and Disaster Preparedness
- Same Sex Marriage in India
- Balancing Reproductive Autonomy and Unborn Child's Rights

# GLOBAL HUNGER INDEX 2023

The Global Hunger Index (GHI) is a tool for comprehensively measuring and tracking hunger at global, regional and national levels.

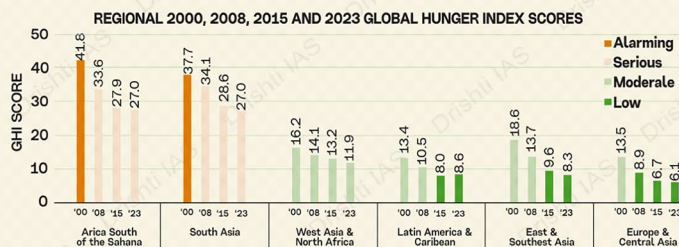
### PREPARED ANNUALLY BY

- European NGOs - Concern Worldwide and Welthungerhilfe
- 2006 (1<sup>st</sup> Published)

### CALCULATION OF GHI SCORE BASED ON

Parameters	Meaning	Share in Score
Undernourishment	Insufficient calorie intake	1/3 <sup>rd</sup>
Child wasting	Low weight for height	1/6 <sup>th</sup>
Child stunting	Low height for age	1/6 <sup>th</sup>
Child mortality	Age <5	1/3 <sup>rd</sup>

### GLOBAL SCENARIO



A score of 0 signifies No Hunger whereas 100 signifies Worst Hunger

### TOP 5 COUNTRIES: (ALL GHI SCORE < 5)

- Belarus, Bosnia & Herzegovina, Chile, China and Croatia

### BOTTOM 5 COUNTRIES

- Lesotho, DRC, Yemen, Madagascar and Central African Republic

### INDIA'S STATUS:

- Rank - 2023: 111/125 (2022 rank - 107/121)
- Score - 28.7 (Serious)
- Rate of Undernourishment - 16.6%
- Under-5 Mortality - 3.1%
- Anaemia in Women (15-24 years) - 58.1%
- Child Wasting Rate - 18.7% (Highest in World)

The Govt of India has rejected the outcomes of Index calling it a flawed measure of "hunger" and reflecting India's true position

### India's Neighbours (Rank)

- Sri Lanka (60<sup>th</sup>), Nepal (69<sup>th</sup>), Bangladesh (81<sup>st</sup>) and Pakistan (102<sup>th</sup>)

# Avian Influenza

## Why in News?

A recent study has shed light on significant shifts in the **ecology and evolution of highly pathogenic avian H5 influenza viruses**, revealing a change in their global distribution.

- These viruses have been of growing concern due to their potential impact on both avian and mammalian populations, including humans.

## What are the Major Findings of the Study?

- While the epicenter of these viruses was originally **confined to Asia**, the study's findings suggest that this **epicenter has now expanded to include new regions in Africa and Europe**.
- The **two H5 strains originating from African and European bird populations** were found to have evolved through **genetic reassortment with low pathogenic viral variants** as they spread.
  - This genetic reassortment is a critical factor driving the evolution and diversification of these viruses.
- The study underlined that the increasing persistence of avian influenza in wild bird populations is a **catalyst for the evolution and spread of new viral strains**.
  - Wild birds play a crucial role in transmitting and amplifying these viruses, contributing to their ongoing evolution.

## What is Genetic Reassortment?

- Genetic reassortment is a type of **genetic recombination that occurs when genes from two organisms are mixed to create a new genetic sequence**. This new sequence is called a recombinant.
- It can **increase genetic diversity during the evolution of seasonal viruses**. It can also lead to novel and potentially deadly viruses.

## What is Avian Influenza?

- **About:**
  - Avian influenza, **often referred to as bird flu**, is a highly contagious viral infection that primarily affects **birds**, particularly **wild birds and domestic poultry**.
  - In 1996, highly **pathogenic avian influenza H5N1 virus** was first identified in domestic waterfowl in Southern China. The virus is named **A/goose/Guangdong/1/1996**.

## ➤ Transmission to Humans and Related Symptoms:

- Human cases of **H5N1** avian influenza occur occasionally, but it is difficult to transmit the infection from person to person. As per **World Health Organisation(WHO)**, when people do become infected, **the mortality rate is about 60%**.
- It can range from **mild flu-like symptoms**, including **fever, cough, and muscle aches**, to severe respiratory issues like **pneumonia, difficulty breathing, and even cognitive problems** such as altered mental status and seizures.

## ➤ Avian Influenza and India:

- **Initial Outbreak:**
  - The initial outbreak of **Highly Pathogenic Avian Influenza (HPAI) H5N1** in India occurred in **2006 in Navapur, Maharashtra**, and was followed by annual outbreaks.
  - **H5N8** was first observed in India in **November 2016**, mainly affecting wild birds across five states, with **Kerala reporting the most cases**.
  - The disease has been reported in **24 states and union territories**, resulting in the culling of over 9 million birds to control its spread.
- **Related Initiative:**
  - India's approach to controlling Highly Pathogenic Avian Influenza (HPAI) follows a **"detect and cull" policy** as outlined in the **National Action Plan for Prevention, Control, and Containment of Avian Influenza (revised - 2021)**.

## ➤ Treatment:

- Antivirals have demonstrated effectiveness in the **treatment of avian influenza virus infections** in humans, lowering severity and the risk of death.

## What are the Types of Influenza Virus?

Types	A Subtypes	HPAI vs LPAI
<b>Influenza A</b> (Infects a wide range of animals including birds)	Avian (Can infect humans) H5N1 H7N3 H7N7 H7N9 H9N2 H10N8	HPAI H5N1 LPAI H5N1 HPAI H5N8 LPAI H5N8
<b>Influenza B</b> (Mainly infects humans)	Swine (Can infect humans) H1N1 H1N2 H3N2	Subtypes can be classified as high path or low path based on the ability of the specific virus strain to kill chickens in the lab setting.
<b>Influenza C</b> (Infects humans and pigs but more rare than types A and B)	Most common human H1N1 H3N2	
<b>Influenza D</b> (Infects cattle)		

Note:

**Note:** HPAI stands for Highly Pathogenic Avian Influenza and LPAI stands for Low Pathogenic Avian Influenza

## Dengue

### Why in news?

Recently, Dengue cases have surged significantly in some states like **Uttar Pradesh, West Bengal, and Tamil Nadu**.

### What is Dengue?

- **About:**
  - Dengue is a self-limiting febrile illness with symptoms ranging from asymptomatic to severe.
  - Dengue is a mosquito-borne tropical disease caused by the dengue virus (Genus Flavivirus), transmitted by several species of female mosquito within the genus *Aedes*, principally ***Aedes aegypti***.
    - This mosquito also transmits **chikungunya and Zika infection**.
- **Serotypes of Dengue:**
  - There are 4 distinct, but closely related, serotypes (separate groups within a species of microorganisms that all share a similar characteristic) of the virus that cause dengue (DEN-1, DEN-2, DEN-3 and DEN-4).
- **Symptoms:**
  - Sudden high fever, severe headaches, pain behind the eyes, severe bone, joint, and muscle pain, etc.
- **Dengue Vaccine:**
  - The dengue vaccine CYD-TDV or Dengvaxia was approved by the US Food & Drug Administration in 2019, the first dengue vaccine to get the regulatory nod in the US.
    - **Dengvaxia** is basically a **live, attenuated dengue virus** which has to be administered in people of ages 9 to 16 who have laboratory-confirmed previous dengue infection and who live in endemic areas.
  - Researchers at **India's National Centre for Biological Sciences**, in collaboration with nine other institutions in India, Africa, and the US, have developed India's **first and only DNA vaccine** candidate for dengue fever.
    - In preliminary trials on mice, the candidate generated a robust immune response and

improved survival rates after exposure to the disease.

### ➤ Controlling Dengue Using Bacteria:

- Researchers from the World Mosquito Program have **used mosquitoes infected with Wolbachia bacteria to successfully control dengue, leading to a 77% reduction in incidence in Indonesia**.

### What is DNA Vaccine?

- A DNA vaccine is a type of vaccine that uses a small piece of DNA that codes for a specific antigen (a molecule that triggers an immune response) from a pathogen, such as a virus or bacterium, to stimulate an immune response.
- The DNA is injected directly into the body's cells, where it instructs the cells to produce the antigen.
  - The immune system then recognizes the antigen as foreign and mounts an immune response against it, which helps to develop immunity to the pathogen.
- DNA vaccines are third-generation vaccines.
- The ZyCoV-D is the world's first and India's indigenously developed DNA based vaccine for **Covid-19**.

## Cancer Cases and Cure in India

### Why in News?

A recent study published in **The Lancet Regional Health Southeast Asia** has revealed that there is a significant regional disparity in the survival rates of **cervical cancer** patients across India.

### What is Cervical Cancer?

- Cervical cancer **develops in a woman's cervix** (the entrance to the uterus from the vagina).
- Almost all cervical cancer cases (**99%**) are linked to **infection with high-risk human papillomaviruses (HPV)**, an extremely common virus transmitted through sexual contact.
- Two **HPV types (16 and 18)** are responsible for nearly 50% of high grade cervical pre-cancers.
- Cervical cancer is the **fourth most common cancer among women globally**. About 90% of the new cases and deaths worldwide in 2020 occurred in **low- and middle-income countries**.

Note:



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- Comprehensive cervical cancer control includes **primary prevention (vaccination against HPV)**, **secondary prevention** (screening and treatment of pre-cancerous lesions), **tertiary prevention** (diagnosis and treatment of invasive cervical cancer) and palliative care.

### ***What are Some of the Challenges Faced by Healthcare Providers in Curing Cancer?***

- **Heterogeneity of Cancer:** **Cancer** is not a single disease **but a group of diseases characterized by the uncontrolled division and growth of abnormal cells**. The heterogeneity of cancer makes it challenging to find a universal cure, as each type may require a different approach.
- **Late Diagnosis:** Many cancer cases are **diagnosed at an advanced stage, reducing the chances of a complete cure**. Early detection methods and public awareness are crucial but often lacking in many regions.
- **Treatment Toxicity:** Traditional cancer treatments, **such as chemotherapy and radiation therapy, can have severe side effects**, affecting a patient's quality of life. Developing targeted therapies with fewer side effects is a challenge.
- **Resistance to Treatment:** **Some cancers develop resistance to treatment over time, making it harder to cure**. Developing strategies to overcome resistance is a key challenge.
- **Cost of Treatment:** Cancer treatment **can be prohibitively expensive**, and not all patients can afford it. The high cost of cancer drugs and therapies is a significant barrier to curing cancer.
- **Lack of Access to Care:** In many regions, especially in low-income countries, there is a lack of access to cancer care facilities and specialists. This contributes to regional disparities in cancer outcomes.
  - Apart from this, **lack of awareness among patients about their rights and obligations under the law and schemes and inadequate training and capacity building** for healthcare providers aggravate the issue.
- **Limited Availability of Specialized Care:** Specialized cancer care centers, equipped with the latest technology and skilled healthcare professionals, **are concentrated in urban areas**, leaving rural and remote areas underserved.
- **Stigmatization and Fear:** **Cultural and social stigmatization can lead to delayed diagnosis and treatment**, as patients may avoid seeking help due to fear, shame, or misinformation.

### ***What are the Different Ways to Reduce Regional Disparities in Cancer Care in India?***

- **Awareness and Education:** Launch public **awareness campaigns about cancer prevention, early detection, and available treatments**. These campaigns should be tailored to different regions and languages.
- **Preventive Measures:** Promote healthy lifestyles, discourage tobacco use, and emphasize the importance of regular screenings and vaccinations (**e.g., HPV vaccine for cervical cancer prevention**).
- **Primary Healthcare Strengthening:** Improve the quality and accessibility of primary healthcare in underserved regions. Develop a **network of primary healthcare centers** that can identify and refer to potential cancer cases.
- **Telemedicine:** Use **telemedicine and mobile health units** to provide cancer consultations and education to remote areas. This can help patients access expert opinions and guidance.
- **Government Initiatives:** Implement and fund government-sponsored cancer care initiatives, such as the **National Cancer Control Program**. Allocate resources to build and upgrade cancer treatment centers in underserved regions.
- **Subsidized Treatment:** Provide **subsidies for cancer treatment**, especially for economically disadvantaged patients, through government schemes and insurance programs.
- **Research and Development:** Invest in **cancer research and innovation to develop cost-effective treatments and diagnostics**. Encourage partnerships between government, academia, and the private sector.
- **Community Engagement:** Involve **local communities and NGOs in awareness campaigns and support services**. This can help in breaking down cultural stigmas and improving access to care.

#### **What are the Government Initiatives Related to Cancer Treatment?**

- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke**
- **National Cancer Grid**
- **National Cancer Awareness Day**
- **HPV Vaccine**

Note:



## Palliative Care

### Why in News?

A recent study has shed light on the **overwhelming financial burden** faced by patients grappling with serious illnesses.

- As the cost of treating life-limiting illnesses pushes individuals into poverty, **palliative care** becomes **essential to address this critical issue** and advocate for holistic patient-centered care.

### What is Palliative Care?

#### ➤ About:

- **Palliative care** is a specialized approach to healthcare that focuses on **improving the quality of life** and providing comprehensive support to individuals facing **serious illnesses or life-limiting conditions**.
  - It is not about curing the disease but rather about addressing the **physical, emotional, social needs of the patient**.
  - It differs from other medical specialties as it **addresses not only physical health but also social and economic realities**.

#### ➤ Significance:

- According to the **World Health Organization (WHO)**, palliative care is explicitly recognized under the **human right to health**.
  - It recognizes that palliative care is part of the comprehensive services required for **noncommunicable diseases (NCDs)** through the **Global Action Plan for the Prevention and Control of NCDs 2013–2020**.
- Early initiation of palliative care in advanced disease stages can **reduce healthcare expenditure by up to 25%**.
  - Also, palliative care **emphasizes vocational rehabilitation** and social reintegration, enabling patients and families to earn a living and maintain their dignity.

**Note:** WHO estimates that 56.8 million people need palliative care each year, including 25.7 million in the last year of life. In India, it's estimated that **5.4 million people need palliative care each year**.

- Only about **14% of people who need palliative care receive it**.

#### ➤ Related Issues in India:

- **Inadequate Investment in Healthcare:** Inadequate investment in India's healthcare system, including the **insufficient fulfillment of basic infrastructure needs**, has resulted in a **backlog of palliative care services**, limiting their availability and accessibility for patients with life-limiting illnesses.
  - Also, with only **1.35% of the GDP** allocated to **government health services** (2019-20), patients bear most of the healthcare costs which leaves them at risk of **bankruptcy, decreased satisfaction with treatment**, delayed medical care, poor quality of life, and **lower survival rates**.
- **Limited Awareness and Understanding:**
  - **Among Patients and Families:** Many individuals and their families are unaware of what palliative care entails and **may associate it with end-of-life care only**, leading to delayed or inadequate utilization.
    - Also, most insurance schemes in India do not cover palliative care, further limiting its accessibility.
  - **Among Healthcare Providers:** Even many healthcare professionals lack a clear understanding of palliative care, which result in **insufficient referrals or integration into treatment plans**.
- **Heterogeneous Healthcare Infrastructure:** The healthcare infrastructure varies widely in India, with advanced healthcare facilities concentrated in urban areas and limited access to palliative care services in rural and remote regions.
  - However, even in urban areas, **as palliative care does not generate revenue but saves costs**, it is often **neglected in the increasingly privatized Indian healthcare system**.
- **Palliative Care Programme in India:**
  - While there is no dedicated budget for the **National Palliative Care Program in India**, it is included within the 'Mission Flexipool' under the **National Health Mission (NHM)**.
  - Additionally, the **National Program for Prevention & Control of Non-Communicable Diseases (NP-NCD) launched in 2010** focuses on addressing the rising burden of non-communicable diseases by offering comprehensive healthcare services spanning **promotive, preventive, and curative care across all levels of healthcare**.

Note:

## Disabled Population and Disaster Preparedness

### Why in News?

A recent survey by the **United Nations Office for Disaster Risk Reduction (UNDRR)**, released just ahead of the International Day for Disaster Risk Reduction observed on **October 13**, reveals a lack of progress in government policies for **protecting people with disabilities during natural disasters** over the last decade.

### What are the Findings of the UNDRR's Survey?

#### ➤ Findings of Survey:

- The 2023 survey, covering 6,000 respondents from 132 countries, shows that **84% of people with disabilities** are not informed about evacuation routes, shelter homes, or personal preparedness plans, **compared to 71% in 2013**.
- **Only 11% of respondents** are aware of disaster management plans in their local areas, **down from 17% in 2013**, and less than half are aware of accessible disaster risk information.

#### ➤ Concerns of Disabled:

- People with disabilities **are at greater risk during disasters**, with up to 16% of the global population having disabilities and being **two-four times more likely to be killed by disasters**.
- Despite increased interest in participating in community-level disaster planning, **86% of respondents still feel excluded**, emphasizing the need for inclusion.

#### ➤ Suggestions of Survey:

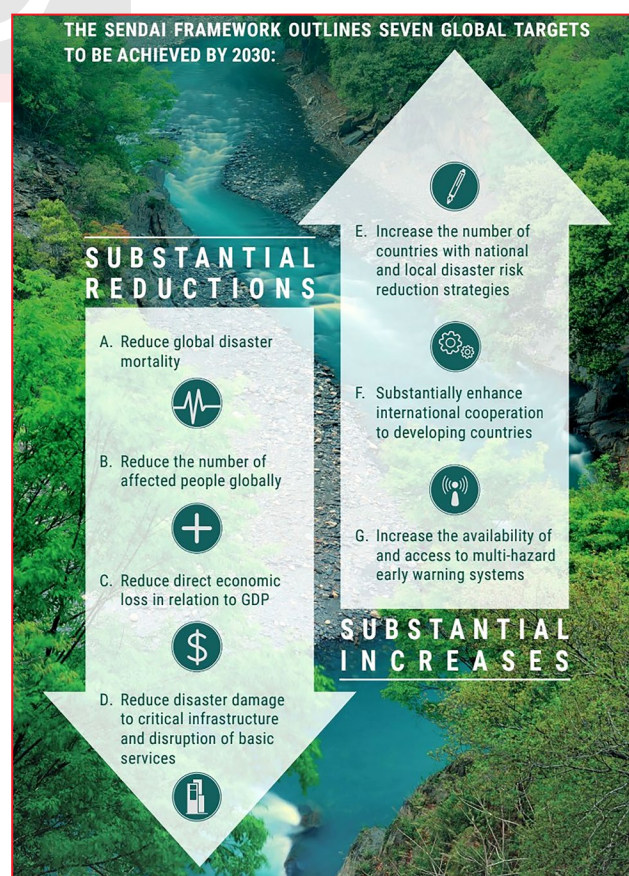
- The report emphasizes the **interconnectedness of disasters and inequality**, with unequal access to services increasing the vulnerability of the most at-risk groups.
- The **Sendai Framework for Disaster Risk Reduction 2015-2030** calls for disability inclusion, accessible disaster risk information, and inclusive early warning systems.
- Strengthening **early warning systems is crucial**, as half of the countries lack these mechanisms, and timely warnings can significantly improve evacuation rates.

- Immediate action is needed to address these challenges and ensure meaningful inclusion of people with disabilities in **community disaster risk reduction planning**.

### What is Sendai Framework for Disaster Risk Reduction 2015-30 ?

#### ➤ About:

- It was adopted at the **Third United Nations World Conference on Disaster Risk Reduction, 2015 in Sendai, Japan**.
- The present Framework applies to the **risk of small-scale and large-scale**, frequent and infrequent, **sudden and slow-onset disasters caused by natural or man-made hazards**, as well as related **environmental, technological and biological hazards** and risks.
- It aims to guide the multi hazard management of disaster risk in development at all levels as well as within and across all sectors.
- It is the **successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters**.



Note:

➤ **Actions to be taken in four Priority Areas:**

- Understanding Disaster Risk:
  - To promote the **collection, analysis, management and use of relevant data** and practical information and ensure its dissemination.
  - To **systematically evaluate, record, share and publicly account for disaster losses** and understand the economic, social, health, educational, environmental impacts.
- **Strengthening Disaster Risk Governance to Manage Disaster Risk:**
  - To carry out an **assessment of the technical, financial and administrative disaster risk management capacity** to deal with the identified risks at the local and national levels.
  - To encourage the establishment of necessary mechanisms and incentives to ensure high level of compliance with the existing safety-enhancing provisions of sectoral laws and regulations.
- **Investing in Disaster Risk Reduction for Resilience:**
  - To allocate the necessary resources, including finance and logistics, as appropriate, at all levels of administration **for the development and the implementation of disaster risk reduction strategies**, policies, plans, laws and regulations in all relevant sectors.
- **Recovery, Rehabilitation and Reconstruction:**
  - To establish **community centres** for the promotion of public awareness and the stockpiling of necessary materials to implement rescue and relief activities.
  - To **train the existing workforce and voluntary workers** in disaster response and strengthen technical and logistical capacities to ensure better response in emergencies.

**What are the Initiatives to Empower the Persons with Disabilities (PwD)?**

➤ **Global:**

- **UN Convention on the Rights of Persons with Disabilities:**
  - The **UN Convention on the Rights of PwD (UNCRPD)**, which was **adopted in 2006**, defines persons with disabilities as those “who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others”.

- India **ratified the Convention in 2007.**

- The Indian Parliament enacted the **Rights of Persons with Disabilities Act, 2016** with a view to fulfilling the obligations under the **UNCRPD**.

➤ **Indian Efforts for Persons with Disability:**

○ **Constitutional Provisions:**

- **Article 41 of the Directive Principles of State Policy (DPSP)** states that the State shall make effective provision for securing right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement, within the limits of its economic capacity and development.
- The subject of ‘relief of the disabled and unemployable’ is specified in the state list of the Seventh Schedule of the constitution.

○ **Legislation for Disabled - Right of Persons with Disabilities Act, 2016:**

- The **Right of Persons with Disabilities Act, 2016** replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.
- The types of disabilities have been **increased from 7 to 21**. The Act added mental illness, autism, spectrum disorder, cerebral palsy, muscular dystrophy, chronic neurological conditions, speech and language disability, **thalassemia, hemophilia, sickle cell disease, multiple disabilities including deaf blindness**, acid attack victims and **Parkinson’s disease** which were largely ignored in earlier Act.
- It increases the **quantum of reservation for people suffering from disabilities from 3% to 4% in government jobs and from 3% to 5% in higher education institutes**.
- Every child with benchmark disability **between the age group of 6 and 18 years shall have the right to free education**.
- **Accessible India Campaign (Creation of Accessible Environment for PwDs):**
  - A nation-wide flagship campaign for achieving universal accessibility that will enable persons with disabilities **to gain access for equal opportunity and live independently and participate fully in all aspects of life in an inclusive society**.

Note:



## Same Sex Marriage in India

### Why in News?

Recently, The **Supreme Court** has delivered its long awaited verdict **rejecting petitions** to legalise **same-sex marriage** and delved deeper on the provisions of the **Special Marriage Act, 1954** to examine the issue thoroughly, which have convergence and interrelationship with **homosexuality**.

### What is the Observation of the Supreme Court (SC)?

#### ➤ Against Constitutional Validity:

- A five-judge Constitution Bench of the apex court headed by **Chief Justice of India** ruled in a **3:2 verdict** against giving constitutional validity to same-sex marriages.

#### ➤ Domain Of Parliament:

- The CJI, in his opinion, concludes that the **court can neither strike down or read words into the Special Marriage Act (SMA) 1954** to include same sex members within the ambit of the **SMA 1954**. **The top court said it is for Parliament and state Legislature to formulate laws on it.**

#### ➤ Other Observations:

- However, at the same time, the **SC says the relationship of marriage is not a static one.**
- **SC holds that** queer persons have an **equal right and freedom to enter into a "union"**.
- **All five judges** on the Bench, agreed that **there is no fundamental right to marry** under the Constitution.

#### ➤ CJI and Justice Kaul (Minority Opinions): Favoured extension of Civil Union to same-sex couples:

- A **'civil union'** refers to the legal status that allows same-sex couples specific rights and responsibilities that are normally conferred upon married couples. Although a civil union resembles a marriage, **it does not have the same recognition** in personal law as marriage.

### What is the Legality of Same-Sex Marriages in India?

- The right to marry is **not expressly recognized either as a fundamental or constitutional right** under the Indian Constitution but a statutory right.

- Though marriage is regulated through various statutory enactments, its recognition as a fundamental right **has only developed through judicial decisions of India's Supreme Court**. Such declaration of law is binding on all courts throughout India under **Article 141** of the Constitution.

#### ➤ Earlier Views of Supreme Court on Same-Sex Marriages:

- Marriage as a **Fundamental Right (Shafin Jahan v. Asokan K.M. and others 2018)**:
  - While referring to Article 16 of the **Universal Declaration of Human Right** and the **Puttaswamy case**, the SC held that the right to marry a person of one's choice is integral to **Article 21** of the Constitution.
  - **Article 16 (2)** in the Indian constitution provides that there cannot be any discrimination on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of them.
  - The **right to marry is intrinsic to the liberty which the Constitution guarantees as a fundamental right**, as the ability of each individual to take decisions on matters central to the pursuit of happiness. Matters of belief and faith, including whether to believe are at the core of constitutional liberty.
- **LGBTQ Community** Entitled to **all Constitutional Rights (Navjet Singh Johar and others v. Union of India 2018)**:
  - The SC held that members of the LGBTQ community **"are entitled, as all other citizens, to the full range of constitutional rights including the liberties protected by the Constitution"** and are entitled to equal citizenship and "equal protection of law".

### What is the Special Marriage Act (SMA) 1954?

#### ➤ About:

- Marriages in India can be registered under the respective personal laws **Hindu Marriage Act, 1955, Muslim Personal Law Application Act, 1937, or under the Special Marriage Act, 1954.**
- It is the duty of the Judiciary to ensure that the rights of both the husband and wife are protected.
- The **Special Marriage Act, 1954** has provisions for civil marriage for people of India and all Indian nationals in foreign countries, irrespective of religion or faith followed by either party.

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- When a person solemnized marriage under this law, then **the marriage is not governed by personal laws but by the Special Marriage Act.**

➤ **Features:**

- Allows people **from two different religious backgrounds to come together** in the bond of marriage.
- Lays down the procedure for **both solemnization and registration of marriage**, where either of the husband or wife or both are not Hindus, Buddhists, Jains, or Sikhs.
- **Being a secular Act**, it plays a key role in liberating individuals from traditional requirements of marriage.

### **What are the Arugments in Favour of Same Sex Marriage?**

- **Equal Rights and Protection Under the Law:** All individuals, regardless of their sexual orientation, **have the right to marry and form a family.**
  - Same-sex couples should have the same legal rights and protections as opposite-sex couples.
  - Non-recognition of same-sex marriage **amounted to discrimination** that struck at the root of the dignity of **LBTQIA+ couples.**
- **Strengthening Families and Communities:** Marriage provides social and economic benefits to couples and their families which will also benefit the same-sex people.
- **Cohabitation as a Fundamental Right:** The **Chief Justice of India (CJI)** acknowledged that cohabitation is a fundamental right, and it is the government's obligation to legally recognize the social impact of such relationships.
- **Biological gender is not 'absolute':** The Supreme Court of India says that **biological gender is not absolute**, and that gender is more complex than just one's genitals. There is **no absolute concept of a man or a woman.**
- **Global Acceptance:** Same-sex marriage is legal in many countries around the world, and denying this right to individuals in a democratic society goes against the global principles.
  - **In 32 countries, same-sex marriage is legal.**

### **What are the Arugments Against Same Sex Marriage?**

- **Religious and Cultural Beliefs:** Many religious and cultural groups believe that marriage should only be between a man and a woman.
  - They argue that **changing the traditional definition of marriage would go against the fundamental principles of their beliefs and values.**
- **Procreation:** Some people argue that the primary purpose of marriage is **procreation, and that same-sex couples cannot have biological children.**
  - Therefore, they believe that same-sex marriage should not be allowed because it goes against the natural order of things.
- **Legal issues:** There are concerns that allowing same-sex marriage will **create legal problems, such as issues with inheritance, tax, and property rights.**
  - Some people argue that it would be too difficult to change all the laws and regulations to accommodate same-sex marriage.
- **Issues with Adoption of Childrens:** When queer couples adopt children, it can lead to **societal stigma, discrimination, and negative impacts on the child's emotional and psychological well-being**, especially in Indian society where acceptance of the LGBTQIA+ community is not universal.

## **Balancing Reproductive Autonomy and Unborn Child's Rights**

### **Why in News?**

The **Supreme Court of India** recently **denied permission to terminate a 26-week pregnancy** for a married woman under the provisions of the **Medical Termination of Pregnancy(MTP) Act, 1971.**

### **What was the Issue in the Case?**

- **Case:**
  - The case involved a 27-year-old married woman who was in her 26th week of pregnancy, seeking legal permission to terminate her pregnancy.
    - The woman asserted her physical, emotional, mental, financial, and medical inability to carry, deliver, or raise another child, citing her

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pre-existing conditions and experiences with postpartum depression.

- The woman sought recourse to the **Medical Termination of Pregnancy (MTP) Act of 1971** to plead her case.

➤ **Judgment:**

- The Court expressed **reluctance to order a medical termination** when the **pregnancy is viable** and does not pose an **immediate threat to the woman's life**.
  - The decision is grounded in the interpretation of **Section 5 of the MTP Act, 1971**, which allows abortion only if the woman's **life** and health are in immediate danger.
  - The three-judge Bench, led by the **Chief Justice of India (CJI)**, emphasized that a **woman cannot claim an "absolute, overriding right" to abort**, particularly when medical reports confirm that the **pregnancy doesn't pose immediate danger to her life or that of the fetus**.
    - CJI distinguished the term 'life' in Section 5 of MTP Act, 1971 from its **broad usage in Article 21 of the Constitution**, emphasizing its application to **life-and-death situations**.

- Article 21 protects an individual's **fundamental right to a dignified and meaningful life**.

➤ **Government Stance:**

- The government argues that the **woman's reproductive autonomy cannot infringe upon the rights of her unborn child**.
- Refers to the **Medical Termination of Pregnancy (Amendment) Act of 2021**, which extended the abortion deadline to **24 weeks** in cases of substantial foetal abnormalities.
  - Believes that **once a viable baby is present**, the relief should not be one-sided, and the **woman's right to bodily autonomy should not go beyond the Act**.
- Argues that the woman's fundamental right to choice can be curtailed.

➤ **Implications and Challenges**

- The case raises fundamental questions about **women's reproductive rights**, even in **late stages of pregnancy**, and the ethical considerations surrounding abortion.

- Legal experts and advocates have differing opinions on whether an absolute right to terminate pregnancy should exist, especially in the absence of abnormalities.

- This complex legal and ethical dilemma highlights the need for further discourse and clarity on reproductive rights in India.

- The case also highlights the **challenges women face in accessing legal abortion services in India**.

### **What are the Legal**

#### **Provisions Related to Abortion in India?**

- Until the 1960s, abortion was illegal in India. The **Shantilal Shah Committee** was formed in the mid-1960s to examine the need for regulations. As a result, the **Medical Termination of Pregnancy (MTP) Act, of 1971** was passed, legalizing safe **abortions and protecting women's health**.
  - The MTP Act, of 1971, permits licensed medical professionals to perform abortions in specific predetermined situations as provided under the legislation.
  - The **MTP Act was amended in 2021** to allow certain categories of women, such as rape victims, minors, mentally ill women, etc., to **obtain abortions up to 24 weeks of gestation**, raising it from the previous 20 weeks.
    - It sets up state-level **Medical Boards to decide if a pregnancy may be terminated after 24 weeks** in cases of substantial fetal abnormalities.
  - The MTP Act also provides for the protection of women's privacy, confidentiality, and dignity in accessing safe abortion services.
- The **Preconception and Prenatal Diagnostic Techniques (PCPNDT) Act, 1994**, which **prohibits sex-selective abortions** and regulates the use of prenatal diagnostic techniques for detecting genetic or chromosomal abnormalities in the foetus.
- The Constitution of India, which guarantees the right to life and **personal liberty to all citizens under Article 21**. This right has been interpreted by the Supreme Court of India to include the right to reproductive choice and autonomy for women.



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# Science & Technology

## Highlights

- Venus' Tectonic History
- Self-Reliance in Cybersecurity
- Internal Structure of Mars
- Cloud Seeding
- Thallium Poisoning
- DNA and Face Matching Systems At Police Stations
- SIM Cards
- Role of Dust Suppressants in Mitigating Air Pollution
- Marsquake
- Test on Crew Escape System
- White Phosphorus Munitions
- Large Language Models
- Marine Cloud Brightening
- Climate Adaptation of Marine Microalgae
- India's Space Endeavors
- Cancer Cells' Resistance to Chemotherapy
- Mysterious Cells in Human Brain
- Quantum Engine
- Consanguinity
- India's First CAR-T Cell Therapy Approved

# DARK PATTERNS

"Dark Pattern" refers to a wide variety of practices commonly found in online user interfaces that lead consumers to make choices that often are not in their best interests.

### TERM COINED BY

- ☞ Harry Brignul, a user experience (UX) designer, in 2010

### OBJECTIVE - GETTING CONSUMERS TO

- ☞ Purchase more and more
- ☞ Spend more money on a purchase or time on a service than desired
- ☞ Give up more personal data than desired

Dark Pattern (Category)	Meaning
Forced Action	Disclosure of more personal data than desired
Interface Interference	Visual prominence of options favorable to business
Nagging	Repeated requests to change a setting to benefit business
Obstruction	Making it hard to cancel a service
Sneaking	Adding non-optional charges to transactions at final stage
Social Proof	Notification of other consumers' purchasing activities
Urgency	Countdown timer indicating the expiry of deal

### EFFECTS ON CONSUMER

- ☞ Harms to consumer autonomy and privacy
- ☞ Time and Financial loss
- ☞ Psychological detriment
- ☞ Less consumer trust and engagement
- ☞ Weaker or distorted competition

### TOOLS TO DETECT/MITIGATE/ REMOVE DARK PATTERNS

- ☞ Cookie glasses
- ☞ Consent-O-Matic extension
- ☞ Global Privacy Control
- ☞ Truebill

### REGULATIONS

#### International:

- ◆ Consumer Financial Protection Act, 2010 (USA)
- ◆ Consumer Contracts (Information Cancellation and Additional Charges) Regulations, 2013 (EU and UK)

#### India:

- ◆ Rules: Draft Guidelines for Prevention and Regulation of Dark Patterns, 2023

In India, businesses implementing "dark patterns" in their user interfaces to influence consumer choices counts as infringement on "consumer rights" (Consumer Protection Act, 2019).

### STEPS NEEDED

- ☞ Addressing consumer vulnerability to dark patterns
- ☞ Fostering consumer-friendly digital choice architecture
- ☞ Issuing regulatory guidance
- ☞ Empowering regulatory authorities to take action on dark patterns



Note:



# RARE EARTH ELEMENTS

*Rare Earth Elements are a family of 17 elements in the periodic table - 15 Lanthanide group elements, along with Yttrium and Scandium.*

## + PROPERTIES

- Unique magnetic, luminescent, and electrochemical properties
- High - density, melting point, conductivity and thermal conductance
- Share a trivalent charge (+3)

## + TYPE - LIGHT AND HEAVY REES

Element	Symbol	Atomic Number	Element	Symbol	Atomic Number
<b>Light REES</b>			<b>Heavy REES</b>		
Lanthanum	La	57	Terbium	Tb	65
Cerium	Ce	58	Dysprosium	Dy	66
Praseodymium	Pr	59	Holmium	Ho	67
Neodymium	Nd	60	Erbium	Er	68
Samarium	Sm	62	Thulium	Tm	69
Europium	Eu	63	Ytterbium	Yb	70
Gadolinium	Gd	64	Lutetium	Lu	71
			Yttrium	Y	39

## + PRINCIPAL SOURCE

- Carbonatites:** Host world's largest REE deposits
- Alkaline Igneous Systems:** Comprise a group of uncommon igneous rock types (Deficient in silica, relative to sodium, potassium, and calcium)
- Ion-Absorption Clay Deposits:** Southern China (World's primary source of heavy REEs.)
- Monazite-Xenotime-Bearing Placer Deposits:** Principal source of rare earths and thorium in India



## + APPLICATIONS

- In lights, screens, and glass
- As catalysts
- In magnets, electronics and steel alloys
- In defence and energy sectors

## + ISSUES

- Sufficiently available but extraction/ utilisation unviable economically
- Heavy REEs not available in extractable quantities

## + INTERNATIONAL PRODUCTION

- China's monopoly (accounts for 60% of total)

**World Reserves of Rare Earths (By Principal Countries)**  
(In '000 tonnes of REO equivalent content)

Country	Reserves
World: Total (rounded off)	120000
Australia	3300
Brazil	22000
Myanmar	NA
Burundi	NA
Canada	830
China	44000
Greenland	1500
India	6900
Madagascar	NA
Russia	12000
South Africa	790
Tanzania	890
Thailand	NA
USA	1400
Vietnam	22000
Other countries	310

## Venus' Tectonic History

### Why in News?

According to a new study, **Venus**, often referred to as **Earth's** sister planet, may have experienced tectonic activity about **4.5 billion to 3.5 billion years ago**.

### What is Venus' Tectonic History?

#### ➤ About Plate Tectonics:

- Plate tectonics**, a fundamental scientific theory, explains how **Earth's thin outer shell is divided into tectonic plates that float on the planet's mantle**. This process has contributed to the formation of

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oceans, continents, mountains, and the sustenance of life on Earth.

➤ **Venus, Earth's "Sister" Planet:**

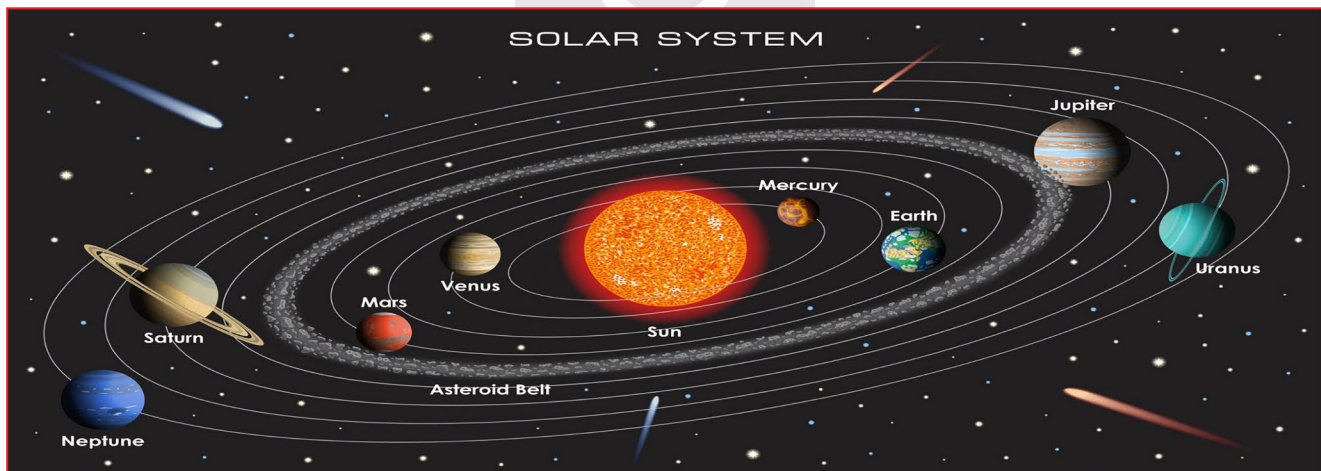
- While Venus and Earth **share similarities in size, mass, density, and volume**, Venus remains the least understood among terrestrial planets.
- The study suggests that Venus and its tectonic history, **has intriguing implications for the planet's atmospheric composition and potential for ancient microbial life.**

➤ **Implications:**

- The study posits that plate tectonics, akin to Earth's, may have **played a crucial role in shaping Venus's carbon dioxide- and nitrogen-rich atmosphere.**
- With approximately **96.5% carbon dioxide and less than 3.5% nitrogen**, understanding Venus's atmospheric composition is crucial.
- Also, Venus may have been home to **microbial life billions of years ago due to tectonic activities.**

**How Plate Tectonics has brought Changes on Venus?**

- Plate tectonics on Venus **would likely have ceased due to loss of water and an increasingly hot and thick atmosphere**, possibly depleting the necessary ingredients for tectonic movement.
- The researchers propose that planets can transition in and out of different tectonic states, **suggesting the potential for planets to shift in and out of habitability rather than maintaining a constant state.**
  - This realization **challenges the binary perspective of tectonics being either true or false** throughout a planet's history.
- To confirm their findings and delve deeper into Venus's tectonic history, the researchers are hopeful for insights from the **NASA** upcoming mission to Venus, called **DAVINCI**.
  - This mission **could provide vital clues and enhance our understanding of Venus's geological past.**
  - Additionally, the researchers aim to uncover the **reasons behind Venus losing its plate tectonics over time.**



**What is Venus?**

➤ **About:**

- It is named after the Roman goddess of love and beauty. It is the **second planet from the Sun** and **sixth in the solar system in size and mass.**
  - It is the **second brightest** natural object in the night sky **after the Moon**, probably that is the reason why it was the **first planet to have its motions plotted across the sky**, as early as the second millennium BC.

➤ **Characteristics:**

- Unlike the other planets in our solar system, **Venus and Uranus spin clockwise** on their axis.
- It is the **hottest planet** in the solar system because of the **high concentration of carbon dioxide** which works to produce an intense **greenhouse effect.**
- A **day on Venus is longer than a year.** It takes Venus **longer to rotate once on its axis than to complete one orbit of the Sun.**

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- That's **243 Earth days to rotate once** - the longest rotation of any planet in the Solar System - and only **224.7 Earth days to complete one orbit of the Sun**.

➤ **Comparison With Earth:**

- Venus has been called **Earth's twin** because of the **similarities in their masses, sizes, and densities and their similar relative locations** in the solar system.
- No planet approaches closer to Earth than Venus; at its nearest it is the **closest large body to Earth other than the Moon**.
- Venus has **90 times the atmospheric pressure of Earth**.

**What are the Different Missions to Mars?**

- **DaVinci Plus**
- **Veritas**
- **Shukrayaan I**
- **Venus Mission 2024**
- **Akatsuki in 2015**
- **Venus Express in 2005**

## Self-Reliance in Cybersecurity

**Why in News?**

Recently, the Prime Minister of India has emphasised the importance of **Self-Reliance in Cybersecurity** during the 7<sup>th</sup> edition of the **India Mobile Congress**.

- PM's emphasis on self-reliance in the entire cybersecurity value chain, including hardware, software, and connectivity, reflects the **growing concern about the security of India's digital infrastructure**.

**What is Cybersecurity?**

- Cybersecurity is the **practice of protecting computer systems, networks, devices, and data** from theft, damage, unauthorised access, or any form of malicious intent.
- It encompasses a wide range of technologies, processes, and practices designed to safeguard digital information and the infrastructure that stores, processes, and transmits it.

**What is Self Reliance in Cybersecurity?**

- **About:**
- Self-reliance in cybersecurity refers to a nation's ability to develop and maintain its own capabilities, technologies, and **expertise to protect its digital**

**infrastructure, data, and information systems** without relying heavily on foreign technology or external assistance.

- It emphasizes the development and deployment of indigenous cybersecurity solutions and practices, reducing dependence on external sources for cybersecurity tools and expertise.

➤ **Need for Self Reliance in Cyber Security:**

- **National Security:** Many of a nation's critical infrastructure systems, such as energy grids, transportation networks, and communication systems, rely on digital technology.
  - Modern military operations are **heavily dependent on digital technology**.
  - Any compromise in cybersecurity can **result in significant disruptions**, posing a direct threat to national security.
- **Geopolitical Considerations:** Over-reliance on foreign technology, particularly from countries with which India may have strained relations such as China, can pose a security risk.
  - Since India imports the majority of electronic raw materials from China, which is a cause for concern for India.
  - Achieving self-reliance reduces the **vulnerabilities associated with depending on technology** from external sources.
- **Technological Independence:** Self-reliance necessitates the creation of secure and reliable hardware, software, and networking components.
  - This encourages innovation and research in the field of cybersecurity.
  - Relying on foreign technology may expose the supply chain to vulnerabilities. Self-reliance allows India to have greater control over the entire technology supply chain, reducing potential risks.

**What are the Challenges Related to Cybersecurity in India?**

- **Profit-Friendly Infrastructure Mindset:**
- Post liberalisation, the **Information Technology (IT), electricity and telecom sector** has witnessed large investments by the private sector. However, their inadequate focus on cyber attack preparedness and recovery in regulatory frameworks is a cause of concern.

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- All operators are focused on profits, and do not want to invest in infrastructure that will not generate profits.
- **Absence of Separate Procedural Code:**
  - There is no separate procedural code for the investigation of cyber or computer-related offences.
- **Trans-National Nature of Cyber Attacks:**
  - Most cyber crimes are trans-national in nature. The collection of evidence from foreign territories is not only a difficult but also a tardy process.
- **Expanding Digital Ecosystem:**
  - In the last couple of years, India has traversed on the path of digitalising its various economic factors and has carved a niche for itself successfully.
  - Latest technologies like **5G** and the **Internet of Things (IoT)** will increase the coverage of the internet-connected ecosystem.
  - With the advent of digitalisation, paramount consumer and citizen data will be stored in digital format and transactions are likely to be carried out online which makes India a breeding ground for potential hackers and cyber-criminals.
- **Limited Expertise and Authority:**
  - Offences related to **crypto-currency** remain under-reported as the capacity to solve such crimes remains limited.
  - Although most State cyber labs are capable of analysing hard disks and mobile phones, they are yet to be recognized as 'Examiners of Electronic Evidence' (by the Central Government). Until then, they cannot provide expert opinions on electronic data.

### ***How is India Making Strides in Technology Development?***

- **Domestic Supply Chain Partners:**
  - India is actively working to **diversify its supply chain partners**, especially in the technology sector. This diversification is essential, given the dominance of Chinese players in the manufacturing ecosystem.
  - The government seeks to establish more trusted and secure supply chains to prevent malware and cyber threats.

- **5G and Mobile Broadband:**
  - The government awarded **100 5G Use Case labs to educational institutions across the country**, indicating its commitment to advancing 5G infrastructure.
  - India has transitioned from the **5G rollout stage to the 5G reach-out stage**. The median mobile broadband speed has increased threefold in just one year.
  - India's emphasis on **becoming a leader in 6G technology underscores the country's ambition to stay at the forefront of technological advancements**.
- **Broadband Speed:**
  - India's position in terms of broadband speed has significantly improved, moving from **118<sup>th</sup> to 43<sup>rd</sup> globally** which indicates the growth of high-speed internet access in the country.
- **Electronics and Smartphone Manufacturing:**
  - There has been significant progress in electronics and smartphone manufacturing.
  - Semiconductor manufacturing is a critical component of the technology supply chain and plays a pivotal role in hardware production.
- **Startup Ecosystem:**
  - **India's startup ecosystem** has been flourishing, with a rapid increase in the number of startups.
  - The transformation from having **100 startups before 2014 to approximately 100,000 startups today**.

### **What are the Initiatives Related to Cybersecurity?**

- **Global Initiatives:**
  - **Budapest Convention on Cybercrime:**
  - **Internet Governance Forum (IGF)**
  - **UNGA Resolutions**
- **Indian**
  - **National Cyber Security Strategy 2020**
  - **National Critical Information Infrastructure Protection Centre (NCIIPC)**
  - **Indian Cyber Crime Coordination Centre (I4C).**
  - **National Cyber Crime Reporting Portal**
  - **Computer Emergency Response Team - India (CERT-In)**
  - **India's draft Digital Personal Data Protection Bill 2022**

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## Internal Structure of Mars

### Why in News?

According to a pair of recent studies published in Nature, **Mars's** liquid iron core is likely to be surrounded by a fully molten silicate layer.

- Data from three years of quakes in Mars, including two seismic events caused by meteorite impacts, were used for the study.
- NASA's **InSight Mars Lander** used an instrument called the **Seismic Experiment for Interior Structure (SEIS)** to record seismic waves passing through Mars's interior.

### What are the Key Findings of the Study?

- **Mars's Core Composition:**
  - In 2021, measurements from NASA's InSight lander's SEIS project indicated the presence of a **large, low-density core in Mars, comprising liquid iron and lighter elements like sulphur, carbon, oxygen, and hydrogen.**
  - However, two recent studies challenge this finding. They found that the **Martian core is surrounded by a 150 km-thick layer of near-molten silicate rock,** indicating a **higher core density** than previously thought.
- **Misinterpretation of Core Surface:**
  - The studies reveal that the top of this silicate layer **was initially misinterpreted as the core's surface.** This reinterpretation implies that Mars's core is more compact than earlier estimates, aligning better with existing knowledge of chemical abundances on Mars.
    - This revised understanding suggests that **Mars may have had a turbulent interior following its formation, with temperatures reaching at least 2,000 Kelvin,** rather than a calmer, heat-shedding process into interplanetary space.
- **Impact on Mars's Geological History:**
  - The findings have significant implications for Mars's geological history, **hinting at a more dynamic and energetic early phase.** The presence of a molten silicate layer **implies a vigorous and turbulent interior,** possibly affecting Mars's geological evolution and the distribution of elements within the planet.

### What is InSights Mars Lander?

#### ➤ About:

- **InSight** (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) was sent on a **24-month mission in 2018.**
- InSight will study the **interior of Mars.**
- The landing site is **Elysium Planitia** (a flat-smooth plain just north of the equator considered to be the perfect location from which to study the deep Martian interior), where InSight can stay still and quiet all through.

#### ➤ Functions:

- Mars InSight's goal is to **listen for quakes and tremors** as a way to unveil the Red Planet's inner mysteries.
- The mission seeks to **answer critical questions about rocky planet formation** in the early days of the solar system.

### What are the Various Mars Missions?

- **NASA has a lander (Mars Insight), two rovers (Curiosity and Perseverance), and three orbiters (Mars Reconnaissance Orbiter, Mars Odyssey, MAVEN)**
- **ExoMars rover (2021) (European Space Agency)**
- **Tianwen-1: China's Mars Mission (2021)**
- **UAE's Hope Mars Mission (UAE's first-ever interplanetary mission) (2021)**
- **India's Mars Orbiter Mission (MOM) or Mangalyaan (2013)**
- **Mars 2 and Mars 3 (1971) (Soviet Union)**

## Cloud Seeding

### Why in News?

**Cloud seeding**, a groundbreaking technique to enhance rainfall, has taken centre stage in a recent study published in the *journal Bulletin of the American Meteorological Society*, conducted by the Indian Institute of Tropical Meteorology, Pune.

- The study unveils the potential of cloud seeding to **boost precipitation** in water-scarce regions, offering hope for tackling **drought conditions.**

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# Cloud seeding works if done correctly

Cloud seeding experiments were carried out in Solapur city, which gets less rainfall, from June to September in 2018 and 2019

■ There was 18% increase in rainfall over a 100 sq.km area in Solapur city due to cloud seeding

■ Approximate cost of producing water through cloud seeding was 18 paisa per litre. The cost can drop by over 50% if indigenous seeding aircraft are used

■ 20-25% of cumulus clouds produce rainfall if cloud seeding is done correctly

■ Cloud seeding alone cannot mitigate droughts but can help produce additional rainfall that can partially address water requirements

■ Calcium chloride flare was used for seeding the clouds. The seeding was done at the base of the warm convective clouds and at a time when the clouds were growing

■ The study was carried out for two years to understand the microphysics and characteristics of convective clouds that can be targeted to enhance rainfall

■ The work provides elaborate protocols and technical guidance to plan and conduct cloud seeding in India

**Not all:**  
As microphysics of clouds vary widely, not all clouds produce rainfall through cloud seeding



## What are the Key Highlights of the Study?

### ➤ CAIPEEX Phase-4 Investigation:

- The Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX phase-4) was a two-year study in Solapur (Maharashtra), conducted during the 2018 and 2019 summer monsoons.
- Its primary objective was to assess the **effectiveness of hygroscopic seeding** in deep **convective clouds** and develop a cloud seeding protocol.
  - Researchers used calcium chloride flares for cloud seeding.
    - A cloud seeding flare releases these particles when triggered. The seeding was done at the base of the warm convective clouds and at a time when the clouds were in their growing stage so that the seed particles could enter the clouds with minimum dispersion.
- The experiment employed **two aircraft for cloud parameter study and cloud seeding**.

### ➤ Cloud Seeding's Effectiveness:

- Cloud seeding is proven effective for **enhancing rainfall under suitable conditions**.
- A random seeding experiment selected 276 convective clouds, with 150 clouds subjected to seeding and 122 unseeded.
  - Specific cloud characteristics, including **liquid water content and vertical motion**, were used to identify clouds with potential for rainfall.
  - Targeted convective clouds were typically over one kilometer deep and likely to evolve into deep cumulus clouds.

### ➤ Benefits:

- **Cost-Benefit Ratio:**
  - The approximate **cost of producing water through cloud seeding was 18 paisa per liter** during the research experiment.
  - Using indigenous seeding aircraft could reduce costs by more than 50%.

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### ○ Managing Drought Conditions:

- Cloud seeding alone cannot fully mitigate droughts but can contribute to an **18% increase in rainfall, partially addressing water requirements**.
- Undertaking cloud seeding as part of catchment-scale projects could help in drought management.

### ○ Practical Applications:

- Cloud seeding can significantly benefit regions like Solapur which falls on the **leeward side of the Western Ghats** and hence gets low rainfall.
- Additional water through cloud seeding has the potential to alleviate water scarcity issues in such areas.

### ➤ Microphysics and Cloud Characteristics:

- The two-year study aimed to understand the **microphysics and characteristics of convective clouds** suitable for enhancing rainfall.
- It provides comprehensive protocols and technical guidance for planning and conducting cloud seeding in India.

### ➤ Cloud Variability:

- Not all cumulus clouds respond to cloud seeding; **approximately 20-25% can produce rainfall** if seeding is executed correctly.
- Cloud microphysics varies widely, leading to varied results with cloud seeding.

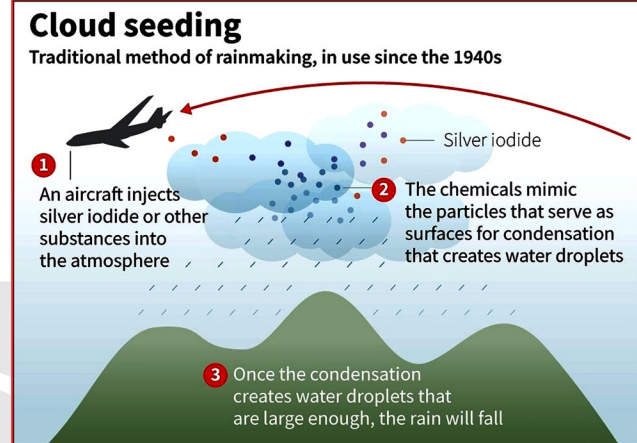
#### Convective Clouds

- **Convective clouds** are clouds that form when **warm, humid air rises** through cooler air in the atmosphere.
  - The warm air is less dense than the surrounding air, so it rises. This process is called **convection**.
  - Convective clouds are also known as **cumuliform clouds**. They look like stacks of cotton balls.
- There are two types of convective clouds: **Cumulus clouds and cumulonimbus clouds**.
  - Cumulus clouds are fluffy, white clouds with a flat base and a rounded top. Cumulus clouds can develop into cumulonimbus clouds, which are associated with thunderstorms.
  - Cirrocumulus Clouds are high-altitude clouds that appear as small, white, and fluffy cloud patches. They often have a wavy or honeycomb-like pattern.

### What is Cloud Seeding?

#### ➤ About:

- It is the process of **artificially generating rain** by implanting clouds with particles such as silver iodide crystals.
- Cloud seeding uses planes to spray clouds with chemicals to condense smaller particles into larger rain droplets.



#### ➤ Cloud Seeding Methods:

##### ○ Static Cloud Seeding:

- This method involves **introducing ice nuclei, such as silver iodide or dry ice, into cold clouds** that have supercooled liquid water droplets.
- The ice nuclei can trigger the formation of ice crystals or snowflakes, which can grow at the expense of the liquid droplets and fall as precipitation.

##### ○ Dynamic Cloud Seeding:

- Dynamic cloud seeding is a method of inducing rain by **boosting vertical air currents**.
  - The process is considered more complex than static cloud seeding because it depends on a sequence of events working properly.

##### ○ Hygroscopic Cloud Seeding:

- This method involves spraying fine particles of hygroscopic materials, such as **salts through flares** or explosives into the base of warm clouds.
- The particles can act as cloud condensation nuclei and increase the number and size of the cloud droplets, which can enhance the reflectivity and stability of the clouds.

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➤ **Applications:**

- Cloud seeding is done to enhance **winter snowfall and increase mountain snowpack**, which can supplement the natural water supply for communities in the surrounding area.
- Cloud seeding can also be done to prevent hailstorms, dissipate fog, induce rainfall in drought-prone regions, or reduce air pollution.

➤ **Challenges:**

- Cloud seeding requires the presence of **moisture-filled clouds**, which are not always available or predictable.
- Cloud seeding does not occur during times when **additional precipitation would be problematic**, such as times of high flood risk or busy holiday travel periods.
- Cloud seeding may have negative effects on the **environment and health**, such as altering the natural water cycle, contaminating the soil and water with chemicals, or affecting the local climate.

## Thallium Poisoning

### Why in News?

Recently multiple family members in Mahagaon village, Maharashtra fell victim to **thallium poisoning**, a chemical that operates in silence, evading detection.

### What are the Key Facts about Thallium?

➤ **About:**

- Thallium(Tl) is a chemical element with the **atomic number 81**, was discovered by **Sir William Crookes in 1861**.
  - It is a soft, heavy, inelastic metal.
- Thallium is **tasteless and odourless** and has been used by murderers as a difficult-to-detect poison.

➤ **Appearance:**

- A soft, silvery-white metal that tarnishes easily.

➤ **Sources:**

- It is found in trace amounts in the **earth's crust**.
- It is found in **several ores**. One of these is pyrites, which is used to produce sulfuric acid. Some thallium is obtained from pyrites, but it is mainly obtained as a by-product of copper, zinc and lead refining.

➤ **Uses:**

- Thallium's utilization is **restricted due to its toxic nature**.
- Thallium sulfate, once a **rodent killer**, is now banned for household use in many developed nations.
- It finds application in the electronics industry for **photoelectric cells**.
- Thallium oxide is used to create high-refraction glass and low-melting glass.
- It is also used in the manufacturing of low temperature thermometers, and imitation jewels.

➤ **Health Hazards:**

- Thallium can damage the nervous system causing headaches, weakness, and irritability. Repeated exposures can cause tremors, hallucinations, coma and death.

➤ **Antidote:**

- **Prussian blue** is used in non-radioactive thallium poisoning.

## DNA and Face Matching Systems At Police Stations

### Why in News?

Over a year after Parliament passed the **Criminal Procedure Identification Act (CrPI), 2022**; the Centre is preparing to introduce '**DNA and Face Matching**' systems in 1,300 police stations nationwide, despite the Act's provisions not yet being fully implemented.

### What is the Context of 'DNA and Face Matching Systems' Under CrPI Act, 2022?

➤ **Introduction to the Act and Rules:**

- In 2022, the Indian Parliament passed CrPI Act that grants police and **central investigating agencies the authority to collect, store, and analyze physical and biological samples**, which even include retina and iris scans, of arrested individuals.
- This legislative move **aimed to enhance law enforcement capabilities and ushered in a new era in criminal identification** and data management.

➤ **Rollout of the Act and Rules:**

- The **responsibility for implementing the Act** and establishing the Standard Operating Procedure (SOP) for the measurement collection process **was entrusted to the National Crime Records Bureau (NCRB)**, a central organization.

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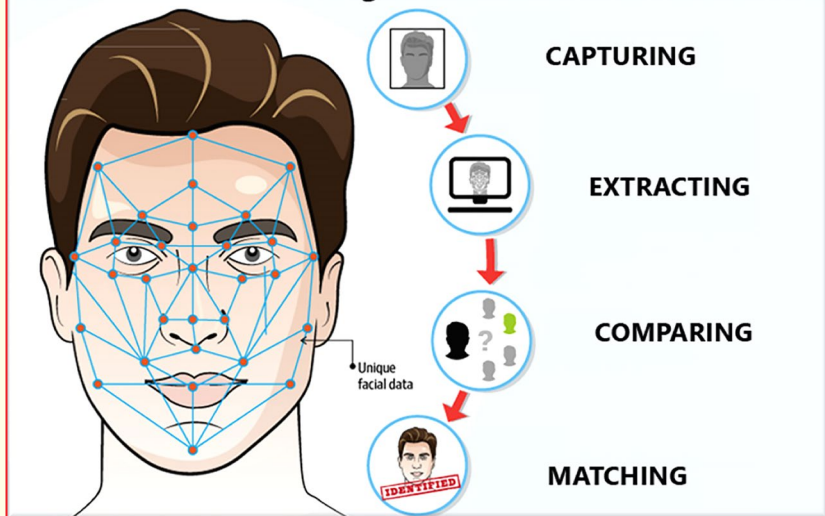
- The NCRB played a pivotal role in guiding police officials on the proper protocol for recording these measurements.
- **Expanding Measures and Committees for Implementation:**
  - The Act and rules did not directly mention DNA sample collection and face matching procedures, but the **NCRB conveyed plans** to implement these measures in discussions with **State police officials**.
  - Additionally, the Ministry of Home Affairs formed a **Domain Committee comprising State police and central law enforcement** representatives for recording DNA data.
- **Challenges and Controversies Surrounding the Act:**
  - Critics **decried the legislation as “unconstitutional” and an intrusion on privacy**.
  - In addition to the controversy, practical challenges emerged, including the need for training and resources in various states, **with concerns over funding and operating costs**.
  - Moreover, the NCRB emphasized the **importance of technologically, legally, and forensically sound tools and systems**, along with robust safeguards to prevent misuse of the collected data. This context underscores the complexity and significance of the Act and its associated rules.

### What is the 'DNA and Face Matching Systems' Technology?

#### ➤ Face Matching System:

- Face Matching System is an **algorithm-based technology which creates a digital map of the face** by identifying and mapping an individual's facial features, which it then matches against the database to which it has access.
- In the **Automated Facial Recognition System (AFRS)**, the large database (containing photos and videos of peoples' faces) is used to match and identify the person.
- Image of an unidentified person, taken from CCTV footage, is compared to the existing database using **Artificial Intelligence** technology, for pattern-finding and matching.

### Biometrics Face Recognition - How does it Work?



#### ➤ DNA Matching Systems:

- DNA matching systems, also known as **DNA profiling or DNA fingerprinting**, are techniques used to compare and identify individuals based on their unique genetic characteristics.
- These systems **analyze specific regions of an individual's DNA**, which are highly variable among people, to create a unique genetic profile for each individual.
- DNA matching is commonly used in criminal investigations to link suspects to crime scenes or victims. DNA evidence found at a crime scene, **such as blood, hair, or bodily fluids, can be compared to the DNA profiles of potential suspects**.

## SIM Cards

### Why in News?

In contemporary times, the usage of smartphones have outgrown other electronic devices so much that an

important component of smartphones, i.e. **Subscriber Identification Module (SIM) Cards** need apt description.

### What is a SIM Card?

#### ➤ About:

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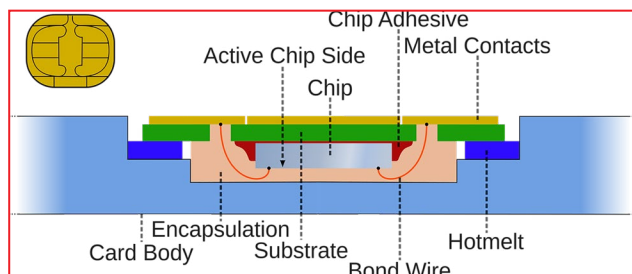
- A SIM card is a tiny **integrated circuit or microchip** that plays a **vital role in identifying subscribers on a cellular network**. It can be thought of as an individual's ID card within the vast city of a cellular network.
- This ID card carries a unique identification number known as the **international mobile subscriber identity (IMSI)**, which is used to locate and confirm the identity of the subscriber when others try to reach them on the network.

➤ **Essential Role in Network Access:**

- When it comes to connecting a mobile phone to a cellular network adhering to the **Global System for Mobile Communications (GSM)** standard, a SIM card is mandatory. This connection relies on a **special authentication key (SAK)** that serves as a digital lock and key mechanism.
  - Each SIM card stores SAK, but **it's inaccessible through the user's phone**. Instead, when the phone communicates with the network, it 'signs' the signals using this key, allowing the network to verify the legitimacy of the connection.
    - It's important to note that **duplicating a SIM card is feasible by accessing and copying this authentication key** onto multiple cards.

➤ **Information Storage:**

- Beyond its primary role in network access, a **SIM card also serves as a storage unit for various data**. It stores **not only the IMSI but also the integrated circuit card identifier**, the subscriber's location area identity, and a list of preferred networks for roaming.
- Additionally, **SIM cards can contain essential emergency contact numbers, and, space permitting, store the subscriber's contacts and SMS messages**.
- This compact chip plays a pivotal role in the **functionality and security of mobile communication on GSM-based networks**.



## How have SIM cards changed?

➤ **Evolution of Smart Cards:**

- The history of smart cards, which include SIM cards, traces back to the late 1960s. Over the years, these smart cards underwent significant changes in size and architecture, spurred by the advancements in technology **described by Moore's law**.
  - **Moore's law** is the observation that the **number of transistors in an integrated circuit (IC) doubles about every two years, making computers faster and cheaper over time**.

➤ **SIM Card Standards and Development:**

- The European Telecommunications Standards Institute (ETSI) **played a pivotal role by formulating the GSM Technical Specification for SIM cards**.
- It covered aspects ranging from **physical features like operating temperature and contact pressure to authentication and data access characteristics**.

➤ **Transition and Compatibility:**

- The term 'SIM card' once referred to both the hardware and software, up until the 2G networks. However, **with the arrival of the Universal Mobile Telecommunications System and 3G networks, a shift occurred**.
- 'SIM' came to represent only the software, while the hardware was labeled the Universal Integrated Circuit Card (UICC).

## What is an eSIM?

➤ **Evolution of SIM Cards: From Physical to eSIM:**

- Unlike its physical predecessors, the **eSIM's software is loaded onto a permanent, non-removable UICC in the mobile device during the manufacturing process**. Notable devices, like **Google Pixel 2, 3, 4, and the iPhone 14 series**, support eSIM functionality.
- With eSIM, **users no longer need to physically replace SIM cards when switching or joining networks**. Instead, network operators can remotely reprogram the eSIM.

➤ **Different Benefits of eSIM Technology:**

- eSIM technology offers several advantages. Firstly, **it's considered environmentally friendly because it eliminates the need for additional plastic and metal for physical SIM cards**, due to its reprogrammable nature.

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- Secondly, eSIMs enhance security by preventing separate access to the SIM application and making duplication more challenging for potential malicious actors.

## Role of Dust Suppressants in Mitigating Air Pollution

### Why in News?

Recently, **Dust suppressants** have gained significant attention as a potential solution to reduce **dust-related pollution** especially in cities like **Delhi** where **air pollution** remains a critical concern.

### What are Dust Suppressants?

#### ➤ About:

- Dust suppressants** are typically composed of **calcium or magnesium salts**, which are mixed with water and **then sprayed on roads**.
- This mixture effectively **suppresses dust**, providing **longer-lasting relief from particulate matter** in the air.

#### ➤ Efficacy:

- The **Central Pollution Control Board (CPCB)** study indicated that the application of dust

# Air Pollutants

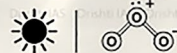
## Sulphur Dioxide (SO<sub>2</sub>)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

**Impact:** Causes respiratory problems.

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



Secondary pollutant formed from other pollutants (NO<sub>x</sub> and VOC) under the action of the sun.

**Impact:** Irritation of the eye and respiratory mucous membranes, asthma attacks.

## Nitrogen Dioxide (NO<sub>2</sub>)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

**Impact:** Chronic lung disease.

## Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

**Impact:** Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

## Ammonia (NH<sub>3</sub>)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

**Impact:** Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

## Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

**Impact:** Anemia, weakness, and kidney and brain damage.

## Particulate Matter (PM)



**PM10:** Inhalable particles, with diameters that are generally 10 micrometers and smaller.

**PM2.5:** Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

**Source:** Emitted from construction sites, unpaved roads, fields, fires.

**Impact:** Irregular heartbeat, aggravated asthma, decreased lung function.

**Note:** These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



Note:

suppressants, when mixed with water, is more effective at controlling pollution than traditional methods, such as **water spraying**.

- The study observed up to a **30% reduction in dust concentration (including PM10, PM2.5, and PM1)** for construction sites and roads following the use of dust suppressants.
- In 2019, the CPCB recommended the **use of dust suppressants on excavated earth surfaces**, construction and demolition waste piles, and access roads in construction areas.

**Note:** Air pollution is the presence of harmful substances in the Earth's atmosphere, originating from natural and human-made sources, which adversely affect **air quality, human health, and the overall environment**.

### ***What are the Other Recent Technological Interventions to Curb Air Pollution?***

- **Ionisation Technology for Pollution Reduction:** This technology aims to **neutralize pollutants through ionization processes**, enhancing air quality in specific areas.
- **Wind Augmentation and Air Purifying Unit (WAYU):** It can be positioned in an **industrial complex, residential complexes, and schools** in the vicinity of traffic road intersection/divider to tackle air pollution.
  - This device works on two principles i.e. **Wind generation for dilution of air pollutants and active pollutants removal**.
- **Medium/Large-Scale Smog Towers:** These towers are **substantial air purifiers** targeting the reduction of particulate matter and pollutants on a larger scale.
- **Indigenous Photonic System for Air Quality Monitoring:** The **Department of Science and Technology (DST)** is developing an indigenous photonic system for **real-time remote air quality monitoring**, improving data accuracy for informed pollution management.

### ***What are the Government Initiatives to Combat Air Pollution?***

- National Clean Air Programme (NCAP)
- BS-VI vehicles
- Turbo Happy Seeder (THS)
- Air Quality and Weather Forecasting and Research (SAFAR)
- Dashboard for Monitoring Air Quality
- National Air Quality Index (AQI)
- Graded Response Action Plan (Delhi)

## **Marsquake**

### ***Why in News?***

Recently, scientists have revealed the causes of the **largest recorded marsquake**. This finding holds scientific importance and carries **implications for forthcoming Mars exploration** by providing fresh insights into the **geology and seismic events of the Red Planet**.

### ***What are the Recent***

### ***Findings Related to Marsquake?***

- A Marsquake, or Martian **earthquake**, is a seismic event **occurring on Mars**. In **2022**, a significant marsquake with a magnitude of **4.7** was recorded.
  - Initial suspicion was a **meteoroid impact** due to **similar seismic signals from past meteoroid-caused quakes**.
- Space agencies like **Indian Space Research Organisation (ISRO)**, **European Space Agency**, **China National Space Administration**, and the **UAE Space Agency** collaborated on a groundbreaking project to search for a crater on Mars.
  - The **search found no impact crater**, leading to the conclusion that the **marsquake resulted from internal tectonic forces**, indicating increased seismic activity.
  - The cause was attributed to the **accumulated stresses within Mars' crust**, evolving over billions of years due to differential cooling and shrinking rates in different regions.
- This discovery has implications for future Mars exploration, aiding in the **identification of safe landing sites** and areas to avoid for astronauts.

### ***What are the Major Facts Related to Mars?***

- Mars, the **fourth planet from the Sun**, takes its name from the Roman God of war. It is often referred to as the **"Red Planet"** due to its **distinctive reddish appearance**. This reddish coloration is primarily attributed to the **presence of a significant amount of iron oxide, commonly known as rust**, in its surface rocks and soil.
- Mars, being the second smallest planet in our solar system after Mercury, **boasts a diameter of approximately 6,791 kilometers**, making it about **half the size of Earth**.

Note:



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- It possesses two moons, known as **Phobos** and **Deimos**.
- The planet experiences **extreme cold**, with **equatorial temperatures reaching 20°C** and **polar regions plunging as low as -140°C** due to its greater distance from the sun.
- Mars is home to **Olympus Mons**, the **tallest volcano in our solar system**, roughly three times the height of Mount Everest.
- A Martian day is **24 hours and 37 minutes**, slightly longer than an Earth day, but a **Martian year lasts nearly twice as long**, spanning **687 Earth days** due to its extended orbit around the Sun.
- Mars' axis of rotation is **tilted 25 degrees** with respect to the plane of its orbit around the Sun. This is similar to Earth, **which has an axial tilt of 23.4 degrees**.
  - **Mars has distinct seasons**, but they last longer than seasons here on Earth.

#### What Missions Have Been Sent to Mars?

- **India's Mars Orbiter Mission (MOM) or Mangalyaan (2013)**
- **ExoMars rover (2021) (European Space Agency)**
- **Tianwen-1: China's Mars Mission (2021)**
- **UAE's Hope Mars Mission (UAE's first-ever interplanetary mission) (2021)**
- **Mars 2 and Mars 3 (1971) (Soviet Union)**

## Test on Crew Escape System

### Why in News?

Recently, **Indian Space Research Organisation (ISRO)** carried out the first of a series of tests of systems and procedures called the **Flight Test Vehicle Abort Mission-1 (TV-D1)** with the aim to ultimately fulfill the objectives of **Gaganyaan Mission** perhaps by 2025.

Mission Highlights	
TV Mission Pillbox	<ul style="list-style-type: none"> <li>➤ Mach 1.2</li> <li>➤ Altitude 11.7km</li> <li>➤ Flight path angle 60°</li> <li>➤ Dynamic Pressure 22.6kPa</li> </ul>
CM-CES separation	<ul style="list-style-type: none"> <li>➤ Mach 0.5</li> <li>➤ Altitude 17km</li> <li>➤ Dynamic pressure 2-3kPa</li> </ul>
Drogue Parachute deployment	<ul style="list-style-type: none"> <li>➤ Altitude 16.7km</li> </ul>
Main Parachute	<ul style="list-style-type: none"> <li>➤ Altitude &lt; 2.5km</li> </ul>

### What is the TV-D1 Test?

#### ➤ About:

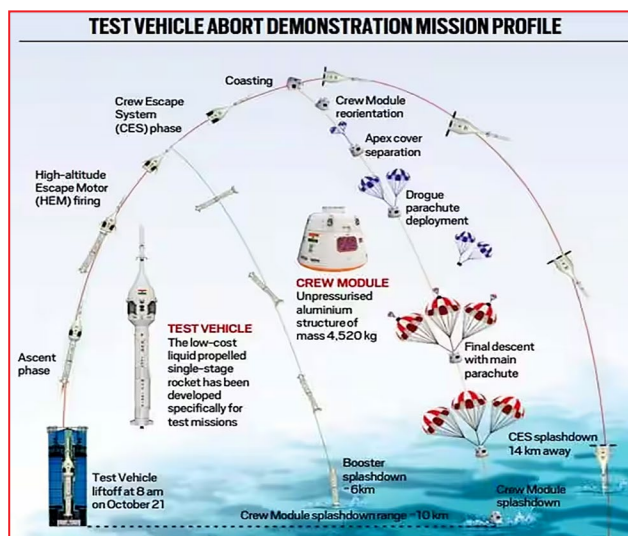
- The **Flight Test Vehicle Abort Mission-1 (TV-D1)** demonstrates the performance of the Crew Escape System of the Gaganyaan project.
- The flight is the **first of two abort missions** to test the safety mechanisms that will allow the Gaganyaan crew to leave the spacecraft in an emergency.
- The Test Vehicle is a single-stage liquid rocket developed for this abort mission. The payloads consist of the **Crew Module (CM)** and **Crew Escape Systems (CES)** with their fast-acting solid motors, along with CM fairing (CMF) and Interface Adapters.

#### ➤ Mechanism:

- The test exercise will see the rocket rise to an **altitude of almost 17 km** before an abort signal is triggered, leading to the separation of the crew module, which will descend using a parachute for a splashdown in the **Bay of Bengal**.
- The rocket, **ISRO's new, low-cost Test Vehicle**, **will reach a peak relative velocity of 363 metres/second (about 1307 km/hr)** during the flight and the crew module will be empty for the test.

#### ➤ Relevance:

- It will demonstrate a **basic version of the crew module** — the capsule in which the astronauts will be seated during the Gaganyaan human space flight.
- The test will **check the functioning of systems for separating the crew module from the rocket** in case of a mid-flight emergency (abort mission) and the escape of astronauts.



Note:



### What is the New Test Vehicle To Be Used in TV-D1?

- **Introduction to the New Test Vehicle:**
  - The ISRO plans to conduct a full-fledged crew module test flight in 2024 using the **human-rated LVM3 rocket**. However, for the TV-D1 mission, ISRO has developed a low-cost test vehicle specifically designed to evaluate various systems.
- **Features of the Test Vehicle:**
  - The Test Vehicle incorporates existing **liquid propulsion technology**.
    - Notable innovations include the throttleable and restartable **L110 Vikas engine**, a core component of the LVM3 rocket's second stage, which offers better control over propellant usage.
- **Cost-Effective Alternative to GSLV Mk III:**
  - Previous crew module test flights, like the **Crew module Atmospheric Re-Entry Experiment (CARE)** in 2014, utilized expensive **GSLV Mk III rockets**, costing Rs 300-400 crore each. In response to cost concerns, ISRO has introduced the more economical Test Vehicle.
- **Utilization of the Test Vehicle for Various Space Technologies:**
  - The Test Vehicle will serve as a platform for testing and developing multiple space technologies, including **Scramjet engine technology for reusable space launch vehicles**.
  - ISRO recognizes the significance of testing the Crew Escape System of the Gaganyaan mission multiple times without incurring substantial expenses, making the Test Vehicle a valuable asset for future space endeavors.

### What is the Present Crew Escape System (CES) in Gaganyaan Mission?

- **Lessons From Failure of Russian Soyuz Rocket :**
  - In 2018, a **Soyuz FG rocket failure** prompted an emergency crew escape during Expedition 57 to the **International Space Station( ISS)** . At 50 km altitude, the crew module separated from the rocket, ensuring the safe return of astronauts. **This marked the first mid-flight Soyuz rocket failure since 1975 and the initial failure of the Soyuz FG in 55 launches.**

- **Ensuring Crew Safety in Gaganyaan:**
  - **ISRO prioritizes crew safety in the Gaganyaan project** and seeks to extend the 2022 deadline for a secure mission. The crew module **must withstand high heat and pressure conditions and feature a reliable escape system in emergencies.**
  - ISRO is developing **life support systems and an integrated health management system** to detect anomalies endangering astronauts and initiate mission aborts.
- **TV-D1 Mission Stages:**
  - In the TV-D1 flight, the **Crew Escape System separates from the Test Vehicle around 11.7 km altitude**. After approximately 90 seconds, the crew module detaches, deploys parachutes, and descends slowly over seven minutes.
  - **The Indian Navy will recover the crew module from the Bay of Bengal**, marking a crucial milestone in the Gaganyaan program's development.
- **Gaganyaan Mission Status:**
  - The **Gaganyaan mission's timeframe is currently 2024 or later**, emphasizing safety over haste. An unmanned mission is planned for the beginning of the following year, with abort missions in the same year.
  - **The manned mission is expected by late 2024 or early 2025, depending on various scenarios.**
  - ISRO has already achieved human rating for critical rocket components, and Crew Escape System design **is obliged to ensure the safeguard mechanism for astronauts over deadline.**

## White Phosphorus Munitions

### Why in News?

Recently, global human rights organizations, **Amnesty International** and **Human Rights Watch** have accused the Israel Defense Forces (IDF) of using **white phosphorus munitions** in **Gaza** and Lebanon, in violation of **International Humanitarian Law (IHL)**.

### What is the White Phosphorus?

- **About:**
  - **White phosphorus** is a pyrophoric that ignites when exposed to oxygen, producing thick, light smoke as well as **intense 815-degree Celsius heat.**

Note:

- **Pyrophoric substances** are those which ignite spontaneously or very quickly (under five minutes) when in contact with air.

➤ **Global Status:**

- Under the **Globally Harmonized System of Classification and Labeling of Chemicals**, the internationally agreed-upon system to standardize chemical hazard classification and communication, **white phosphorus falls under “Pyrophoric solids, category 1”**, which includes chemicals that catch fire “spontaneously” when exposed to air. It is among the most unstable of pyrophoric substances.

➤ **Military Uses:**

- White phosphorus is dispersed in artillery shells, bombs, and rockets. It can also be delivered via felt (textile) wedges soaked in the chemical.
- Its primary military use is as a **smokescreen** — used to hide troop movement on the ground. The smoke acts as a visual obscurant. **White phosphorus is also known to mess with infrared optics** and weapons tracking systems.
- White phosphorus can also be used as an **incendiary weapon**. US forces used white phosphorus munitions during the **second battle of Fallujah in Iraq in 2004**, to force concealed combatants to abandon their positions.

➤ **Harmfulness:**

- **Causes Severe Burns** often down to the bone upon exposure, **Respiratory Problems** and can damage **Infrastructures, crops** and kill **livestock**, with **raging fires**, especially in windy conditions.

**Globally Harmonized System of Classification and Labeling of Chemicals (GHS)**

- The GHS, developed following a number of major industrial accidents in the 1970s and 1980s, plays a fundamental role in protecting workers from chemical hazards through its system of harmonized chemical labels (pictograms) and safety data sheets.
- Following-up on Chapter 19 of Agenda 21 from the Rio Earth Summit in 1992, **the first official version of the GHS was endorsed by the United Nations in 2003**.

**What is the History and Legal Status of Phosphorus Munitions?**

➤ **History:**

- Irish nationalists in the **late 19<sup>th</sup> century** first used **white phosphorus munitions**, in a formulation

that became known as **“Fenian fire”** (Fenian was an umbrella term for the Irish nationalists).

- These munitions have since been used around the world, from the Normandy invasion in World War II and the long-drawn **Nagorno-Karabakh conflict**.

➤ **Legal Status:**

- White phosphorus munitions are **not under a blanket ban**, though their use is regulated under the IHL.
- It is not considered a chemical weapon because its operational utility is primarily due to heat and smoke, rather than toxicity. Thus, its use is governed by the **Convention on Conventional Weapons (CCW)**, specifically **Protocol III**, which deals with incendiary weapons.
  - **First**, it restricts some **but not all use of ground-launched incendiary weapons** where there are concentrations of civilians.
  - **Second**, the protocol’s definition of incendiary weapons covers weapons that are **“primarily designed” to set fire to and burn people, and thus arguably excludes multipurpose munitions** such as those containing white phosphorus, which are considered to primarily be “smoking” agents.

## Large Language Models

### Why in News?

As per **Principal Scientific Advisor**, India will set up a “**high powered committee**” to explore the development of **Large Language Models (LLMs)**, tools that harness **Artificial Intelligence** to create applications that can understand and process human language.

### What are Large Language Models?

➤ **About:**

- **LLMs** : LLMs are a specific class of **generative AI** models that are trained to understand and generate human-like text.
  - These models are built using deep learning techniques, particularly using neural networks.
  - They can generate coherent and contextually relevant text given a prompt or input.
  - One of the most well-known examples of LLMs is **OpenAI’s GPT (Generative Pre-trained Transformer)**.

Note:

➤ **Generative AI:**

- Generative AI refers to the **subset of artificial intelligence** that focuses on creating systems capable of generating content that is similar to what a human might produce.
- These systems learn from **patterns in existing data and then use that knowledge to produce new, original content.**
- This content can take various forms, such as **text, images, music, and more.**

➤ **US-India Collaboration:**

- India and the U.S. have a great relationship now, which is perfect for deep tech cooperation. India's draft policy on deep tech says that Startup India's database lists over 10,000 startups in different deep tech areas, which aligns well with the U.S.-India partnership.

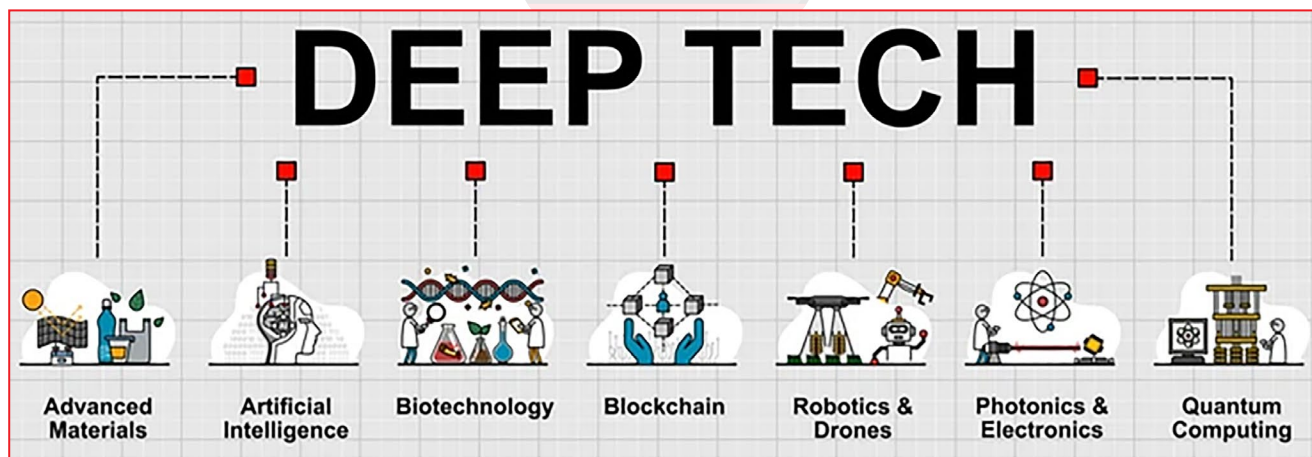
**What is Deep Tech?**➤ **About:**

- Deep tech or deep technology refers to a **class of startup businesses that develop new offerings** based on tangible engineering innovation or scientific discoveries and advances.

- Usually, such startups operate on, but are **not limited to, agriculture, life sciences, chemistry, aerospace and green energy.**
- Deep tech fields like Artificial Intelligence, advanced materials, **blockchain, biotechnology, robotics, drones, photonics, and quantum computing** are moving more and more quickly from early research to market applications.

➤ **Characteristics of Deep Tech:**

- **Impact:** The deep tech innovations are **very radical and disrupt an existing market** or develop a new one. Innovations based on deep tech often change lives, economies, and societies.
- **Time & Scale:** The time required for deep technology to develop the technology and reach the market-ready maturity is **way more than shallow technology development (like mobile apps and websites).** It took decades for artificial intelligence to develop and it is still not perfect.
- **Capital:** Deep tech often requires a **lot of early-stage funding for research and development**, prototyping, validating hypotheses, and technology development.

➤ **Challenges Faced by Deep Tech:**

- For deep-tech startups, **funding is one of the biggest challenges.** Less than 20% of startups receive financing. Government funds are underutilized, and domestic capital is lacking for such startups.
- **Talent and market access, research guidance, investors' understanding of deep-tech, customer acquisition and cost for talent** are the major challenges faced by them.

**What is the Draft National****Deep Tech Startup Policy (NDTSP), 2023?**➤ **About:**

- The policy seeks to **bolster research and development in deep tech start-ups, which work on fundamental and technical problems**, unlike firms that monetise technology with distinguished business models.

Note:

- The policy also seeks to find approaches to provide financing to deep tech start-ups at critical moments, such as before they go to market with their products or ideas.
- **Facilitate Startups:**
  - The policy seeks to simplify the intellectual property regime for such start-ups, ease regulatory requirements, and proposes a slew of measures to promote these firms.
  - NDTSP suggests that an **Export Promotion Board be created to ease barriers** of entry for Indian deep tech start-ups into foreign markets, and that clauses to ease such market access be included in foreign trade agreements.
- **Recommendations:**
  - Policy suggests the creation of an “**Inter Ministerial Deep Tech Committee**” to regularly review the requirements of enabling the deep tech ecosystem to function better.
  - The policy restates the government’s **disappointment with international agreements that it argues have left India on the backfoot** in terms of manufacturing and development power.
  - The need of the hour is a **coordinated, comprehensive push** to optimally engage with international partners and multilateral institutions to **push the Indian Deep Tech Ecosystem**.

#### Office of the Principal Scientific Adviser (PSA) to the Government of India

- India has had a **Principal Scientific Adviser (PSA)** since 1999. Dr. A.P.J. Abdul Kalam was the first PSA from 1999-2001.
- The PSA’s office aims to provide pragmatic and objective advice to the Prime Minister and the cabinet in matters of Science and Technology. The Office of PSA **was placed under the Cabinet Secretariat** in 2018.
- **The Prime Minister’s Science, Technology and Innovation Advisory Council (PM-STIAC)** is an overarching Council that facilitates the PSA’s Office to assess the status in specific science and technology domains, comprehend challenges in hand, formulate specific interventions, develop a futuristic roadmap and advise the Prime Minister accordingly.
- The Office of PSA, supported by the project management team at Invest India, is facilitating the

delivery and progress of all Nine national missions under PM-STIAC. Four of the nine missions, Deep Ocean Mission, Natural Language Translation mission, AI mission, and Quantum Frontier mission have been approved.

## Marine Cloud Brightening

### Why in News?

The concept of **marine cloud brightening** is gaining prominence recently as a tactic for **addressing extreme ocean heat** and as a way to **reduce coral bleaching** and **safeguard marine ecosystems**.

### What is Marine Cloud Brightening?

#### ➤ About:

- The concept of **cloud brightening** traces back to British cloud physicist John Latham, who **proposed this idea in 1990** as a means to control **global warming** by altering the Earth’s energy balance.
- Latham’s calculations suggested that **brightening clouds over vulnerable ocean regions could counteract the warming** caused by a doubling of pre industrial atmospheric carbon dioxide.

#### ➤ Mechanism of Marine Cloud Brightening:

- In **clean maritime air**, clouds primarily form from **sulfates and sea salt crystals**, which are **relatively scarce**, leading to **larger droplets with lower light reflection**.
- **Marine cloud brightening (MCB)** seeks to boost marine cloud reflectivity (albedo), **making clouds whiter and brighter**.
  - It involves using **water cannons or specialized vessels to release fine sea water droplets** into the atmosphere.
  - As these droplets evaporate, **they leave behind salt particles**, serving as cloud condensation nuclei that foster the formation of denser, brighter clouds.

#### Note

Warm clouds consist of numerous small suspended water droplets. These droplets form around **tiny airborne particles known as “aerosols,”** which can be natural (like dust, sea salt, pollen, ash, and sulfates) or human-made (from activities like burning fossil fuels and manufacturing).

Note:



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- A cloud of many small droplets is **brighter than one with fewer large droplets** even if both clouds contain the same amount of water overall.
- **Potential Benefits:**
  - MCB has the **potential to lower sea surface temperatures** in targeted areas, potentially **reducing the frequency and severity of coral bleaching events**.
    - This could **provide a lifeline for corals**, enabling their survival and recovery while the world transitions away from fossil fuels.
  - Researchers are exploring the viability of MCB for the Great Barrier Reef through modeling studies and small-scale experiments.
    - The **Great Barrier Reef, a UNESCO World Heritage Site**, has been particularly vulnerable to coral bleaching, experiencing mass bleaching events in recent years.

**Note:** Surprisingly, humanity is already unintentionally engaged in cloud brightening. The **Intergovernmental Panel on Climate Change** estimates humanity's unintentional **release of aerosols** offsets around **30% of the warming effect due to greenhouse gases**.

- **Sulphates in ship exhaust** are such a potent source of aerosols for droplet formation, the passage of ships leaves cloud trails called **ship tracks**.
- **Challenges and Risks Associated with MCB:**
  - **Technical Feasibility:** MCB involves the large-scale spraying of seawater into the atmosphere at significant altitudes, which presents **engineering complexities in terms of design, cost, maintenance, and operation of the spraying devices**.
  - **Environmental Impacts:** Alterations in cloud patterns and precipitation due to MCB could **affect regional climate and hydrological cycles**, potentially causing unintended consequences like droughts or floods.
  - **Ethical Issues:** MCB raises **ethical dilemmas about human intervention in natural processes** and the governance and decision-making processes surrounding its implementation.
  - **Moral Hazard:** MCB might lead to **complacency among policymakers and the public**, diminishing their commitment to reducing greenhouse gas emissions and adapting to climate change.

## Climate Adaptation of Marine Microalgae

### Why in News?

Recently, Scientists from the **University of East Anglia (UEA), England** have found that eukaryotic phytoplankton, also known as **Microalgae**, have adapted to **cope with Global Warming** and changing ocean conditions.

### What is Marine Microalgae?

- Microalgae are **photosynthetic microorganisms** that can be found in diverse natural environments, such as water, rocks, and soil. They present **higher photosynthetic efficiency** than terrestrial plants, and are responsible for a **significant fraction of the world's oxygen production**.
- Marine microalgae play a pivotal role in the **oceanic food chain** and carbon dioxide absorption.
  - However, as climate change continues, **global warming is causing surface ocean waters** to warm, resulting in reduced nutrient availability due to **less mixing between the surface waters and nutrient-rich deeper waters**.
  - So nutrients become scarce at the surface, impacting **the primary producers such as microalgae** that are present in the top layer.
- This scarcity of nutrients, including iron, impacts the **primary producers like microalgae, causing them to produce less food** and capture less carbon dioxide from the atmosphere.
- Examples of Microalgae: **Diatoms, Dinoflagellate, Chlorella, etc.**

**Note:** Microalgae need sunlight and ample iron to produce food and absorb carbon dioxide, but 35% of the ocean's surface lacks sufficient iron for their growth.

### What are the Implications of this Study?

- **Environmental Adaptation:**
  - Understanding the role of rhodopsin in microalgae's adaptation to changing ocean conditions **can help mitigate the negative effects** of ocean warming on marine ecosystems.
  - This knowledge can be essential for **preserving ecosystems that rely on microalgae** as a food source.
- **Biotechnology Applications:**

Note:

- Similar mechanisms could be employed in biotechnology to enhance the activity of **non-light-dependent microbes**, such as yeast. This could be valuable in the production of **various biotechnological products**, including insulin, antibiotics, enzymes, antivirals, and biofuels.
- **Global Agriculture:**
  - These findings also draw a parallel with land-based agriculture, where reduced nutrient availability can lead to reduced crop yields.
  - Just as microalgae rely on rhodopsin to adapt to changing conditions, there is potential to explore **strategies for enhancing crop resilience** in the face of **Climate Change**.

## India's Space Endeavors

### Why in News?

Recently, the Prime Minister of India has charted a visionary roadmap for the **Indian Space Research Organisation (ISRO)** during a review meeting for the **upcoming Gaganyaan mission**, which is set to be India's first manned mission to space.

### What are the Key Aspects of the Roadmap for ISRO?

- One of the central objectives is the establishment of an **Indian-crafted, indigenous space station**, known as the "**Bharatiya Antariksha Station**." It will serve as a key asset in India's space infrastructure.
  - This monumental endeavor is expected to be **realised by the year 2035**.

**Note:** The **International Space Station**, currently managed by the US, Russia, Canada, Japan, and European space agencies, is anticipated to be **decommissioned by 2030**.

- Landing an **Indian astronaut on the Moon by the year 2040**. This lunar mission promises to be a historic achievement for the nation.
  - To realise this vision, the Department of Space will **develop a roadmap for Moon exploration** which will encompass Chandrayaan missions, development of a Next Generation Launch Vehicle (NGLV), construction of a new launch pad, setting up human-centric laboratories, and associated technologies.

- The Prime Minister has urged Indian scientists to expand their horizons further by working on **interplanetary missions**.
  - These include the development of a space vehicle for **orbiting Venus and another for landing on Mars**, indicating a broader commitment to exploring the solar system.

### What are the Potential Benefits of India's Growing Involvement in Space Activities?

- **Economic Benefits:** India's space capabilities bring forth substantial economic benefits by generating revenue through **commercial satellite launch services**, **creating jobs**, **stimulating technological advancements** with cross-industry applications.
- **Geopolitical Leverage:** India's space capabilities can serve as a **diplomatic tool in resolving international disputes peacefully**.
  - It can also provide India a **geopolitical leverage in international negotiations**, enabling the country to negotiate more favorable terms in **trade, climate accords**, and global agreements.
- **Enhanced Disaster Management:** India could significantly improve disaster management **by using space assets for real-time monitoring and response**.
  - Satellites can aid in predicting **natural disasters**, such as **earthquakes, tsunamis, and floods**, allowing for timely evacuation and resource allocation.
- **Agricultural Revolution:** Space-based technologies, including **satellite imagery and weather forecasting**, can lead to an agricultural revolution.
  - Farmers could receive **precise data on soil conditions, weather patterns, and crop health**, enabling them to optimize farming practices and increase yields.
- **Affordable Space Tourism:** India's **cost-effective space capabilities** could pave the way for affordable space tourism. With advancements in space technology, **suborbital and orbital space tourism might become more accessible to Indian citizens and visitors** from around the world, which can in turn generate massive revenue for the country.

### What are the Roadblocks to India's Space Journey?

- **Technical Challenges:**
  - Despite significant strides made by the private sector in **India's space domain**, there remains a

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substantial journey ahead, posing a formidable challenge in developing **cutting-edge technology for space missions demands that require substantial investment.**

➤ **Financial Constraints:**

- Balancing the **costs of space exploration with other national priorities**, such as healthcare and education, poses financial challenges.
- Also, maintaining sustained investment in space initiatives requires careful planning and support from the government.

➤ **International Collaboration v/s Competition:**

- India faces competition with established space powers like the **US, Russia, and China**, who have made significant strides in space exploration.
- Striking a balance between **collaborating with international space agencies and competing** on the global stage is crucial.

➤ **Managing the Environmental Impact:**

- The **environmental impact of space launches and operations** needs to be managed responsibly as increased space activities **contribute to space debris**, which poses risks to both operational satellites and future space missions.

## **Cancer Cells' Resistance to Chemotherapy**

### **Why in News?**

Recently, a new study, published in *Cell Reports* carried out by researchers at the Netherlands Cancer Institute made a breakthrough in understanding why **certain cancer cells resist a drug called anti-cancer drug (chemotherapeutic agents) Taxol.**

- Their research has the potential to improve **cancer treatment** by finding ways to overcome this resistance, bringing hope to patients facing this formidable adversary.

### **What are the Key Highlights of the Study?**

➤ **Challenges of Chemotherapy:**

- Chemotherapy is a fundamental cancer treatment but poses significant challenges.
- It involves the **targeting of rapidly dividing cancer cells**, often leading to programmed cell death or apoptosis.

- However, this mechanism also affects non-cancerous cells. Any tissue with a significant number of normal cells that are also dividing, such as cells in the digestive tract, the bone marrow, and hair follicles are also affected by **chemotherapeutic agents** and **suffer apoptosis.**

- This cell death underlies the **unpleasant side-effects of chemotherapy**, such as painful **inflammation of the oral cavity and the gut, and nausea, diarrhoea, anaemia, and hair loss.**

- Striking a balance between effective cancer cell destruction and manageable side effects is a challenge faced by oncologists.

➤ **Antibody-Drug Conjugates (ADCs):**

- Researchers have developed ADCs as a more targeted approach for certain cancer types.
- ADCs involve attaching drugs to antibodies designed to **recognize proteins predominantly found in cancer cells.**

- This targeted delivery helps direct chemotherapy directly to cancer cells while sparing healthy ones, reducing collateral damage.

➤ **Chemotherapy Resistance:**

- Some **cancer cells can evade the effects of chemotherapy**, which may lead to a **higher risk of cancer relapse.**

- The study focuses on understanding resistance to Taxol, a commonly used chemotherapeutic agent.

- **The Role of the ABCB1 Gene:**

- Resistance to Taxol is closely linked to the **location of the ABCB1 gene** within the cell's nucleus.
- Sensitive cells exhibit different ABCB1 gene locations compared to resistant cells.
  - In resistant cells, the **gene has detached from the nuclear envelope(membrane) and shifted deeper into the nucleus.**
  - This relocation results in a remarkable 100-fold increase in RNA corresponding to the ABCB1 gene.

➤ **P-gp Efflux Pump:**

- The increased RNA levels lead to the production of the **P-gp efflux pump**, which plays a **pivotal role in chemotherapy resistance.**
- The P-gp pump effectively removes **Taxol and other toxic compounds from the cell**, preventing

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their accumulation at levels necessary to **arrest cell division and trigger apoptosis**. This allows **cancer cells to persist**.

➤ **Identifying Lamin B Receptor (LBR):**

- Researchers sought to understand what anchors the ABCB1 gene to the nuclear envelope in sensitive cells.
  - The study identified the **Lamin B Receptor (LBR) as a crucial protein** influencing the **ABCB1 gene's location and activation**.
- When LBR is absent, **cells can activate the ABCB1 gene** when exposed to Taxol. However, deleting the gene responsible for making LBR doesn't immediately increase ABCB1 expression; it requires exposure to Taxol. This indicates the involvement of additional factors in silencing ABCB1.

➤ **Variability in Cancer Cell Responses:**

- The study highlights variations in how different types of cancer cells respond to the absence of LBR.
  - Some, like lung cancer cells, expressed high levels of ABCB1 RNA.
  - Depleting LBR in lung cancer cells didn't significantly increase Taxol resistance.
  - Breast cancer cells, on the other hand, showed an increased Taxol-resistant fraction after LBR depletion, unlike head and neck cancer cells.
- This variability in responses of different cancer cells depends on LBR to varying degrees to tether genes to the nuclear envelope.

**Chemotherapy**

- It is a type of **cancer treatment** that uses powerful anti-cancer drugs to kill **fast-growing cells in the body**. Cancer cells **grow and multiply much more quickly than most cells** in the body.
- Chemotherapy can be used alone or in combination with other therapies, such as surgery, radiation, or hormone therapy.

**Cancer**

- It is a complex and broad term used to **describe a group of diseases characterised by the uncontrolled growth and spread of abnormal cells in the body**.
  - These abnormal cells, **known as cancer cells**, have the ability to invade and destroy healthy tissues and organs.

- In a healthy body, **cells grow, divide, and die in a regulated manner**, allowing for the normal functioning of tissues and organs.
  - However, in the case of cancer, certain genetic mutations or **abnormalities disrupt this normal cell cycle**, causing cells to divide and grow uncontrollably.
  - These cells can form a mass of tissue called a **tumour**.

**What are the Government Initiatives Related to Cancer Treatment?**

- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke.**
- **National Cancer Grid.**
- **National Cancer Awareness Day.**
- **HPV Vaccine.**

## **Mysterious Cells in Human Brain**

**Why in News?**

Recently, an international team of scientists has released a **Brain Atlas**, mapping the Human Brain in **much finer resolution** than ever before.

- The brain atlas has identified more than **3,300 types of brain cells**.
- The researchers utilized cutting-edge technologies to examine **millions of human brain cells** obtained from **biopsied tissue or cadavers**.

**What are the Key Highlights of the Brain Atlas?**

➤ **Understanding Brain Cells:**

- Many new types of neurons were found, but neurons **make up only about half the cells in the brain**. The other half are far more mysterious.
  - Neuron cells use **electric signals and chemicals** to process information.
- Astrocytes, for example, appear to nurture neurons so that they can keep working properly.
- **Microglia serve as immune cells**, attacking foreign invaders and pruning some of the branches on neurons to improve their signaling.
  - And the **researchers found many new types of these cells** as well.

Note:



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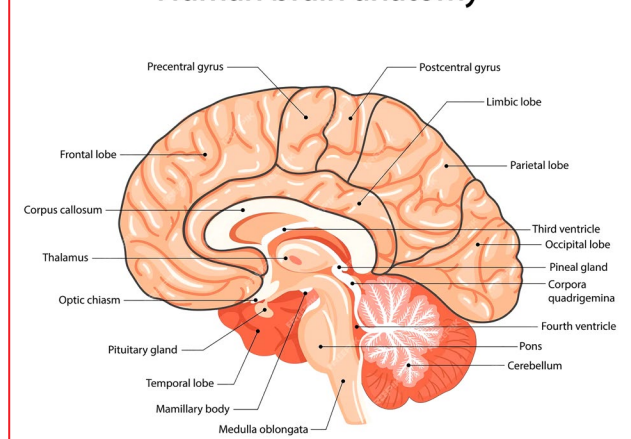
### ➤ Vast Diversity of Brain Cells:

- Much of the brain's diversity is **situated outside the cerebral cortex**, challenging previous notions.
  - Cerebral cortex is the **outer layer that lies on top of the cerebrum**. Cerebrum is the **largest area** of the brain. Cerebrum divides the brain into two halves called hemispheres. The hemispheres are attached by a bundle of **nerve fibers called the corpus callosum**.
- A vast number of the cell types **uncovered in the project lie in the deeper regions of the brain**, such as the brain stem that **leads to the spinal cord**.

### ➤ Genetic Variations and Evolution:

- Comparison with brains of other species, including chimpanzees and gorillas, revealed that all **cell types in human brains matched those found** in our closest primate relatives.
- However, specific genes that **become more or less active in humans** compared to other apes were identified. Many of these genes are linked to building connections (synapses) between neurons.

Human brain anatomy



### What are the Implications of This Study?

- This research offers an **extensive dataset for future studies**, presenting a remarkable advancement in neuroscience.
- However, understanding the intricacies of the human brain entails not just cataloging its components but also comprehending it as a self-regulating system.

## Quantum Engine

### Why in News?

Researchers have made a groundbreaking discovery by developing a **quantum engine**, referred to as the '**Pauli engine**,' which can **convert the energy difference between two quantum states** of a group of atoms into **useful work**.

- This innovation has the potential to advance our understanding of **quantum thermodynamics** and could have applications in the **development of more efficient quantum computers**.

### What are Quantum States and Quantum Engines?

#### ➤ Quantum State:

- A **Quantum state** is a mathematical description of the **physical properties of a quantum system**.
  - In quantum mechanics, the **fundamental theory that describes the behavior of matter and energy at the smallest scales**, quantum states provide a complete specification of a system's properties, including its **position, momentum, energy, spin, and other observable quantities**.
- Quantum phenomena often defy our common sense and challenge our classical understanding of the world.
  - One of these phenomena is the difference between two types of quantum particles: **bosons and fermions**.
    - **Fermions are the building blocks of matter**, bosons are particles that carry the forces acting between them.
  - **Bosons are particles that can share the same quantum state**, while fermions are particles that **obey the Pauli exclusion principle**, which forbids them from occupying the same quantum state.
    - At low temperatures, **bosons can behave very differently than fermions** because an **unlimited number of them can occupy the same lowest energy level**, while fermions have to fill up **higher energy states**.
- This energy difference between bosons and fermions has inspired researchers to design and build a **novel quantum engine** that can **convert this difference into useful work**.

Note:

### ➤ Quantum Engine:

- The **quantum engine or Pauli's engine** consists of a **gas of lithium-6 atoms** that are trapped in a combined **optical and magnetic trap**.
  - The gas can be tuned to **behave like bosons or fermions** by changing the magnetic field around it.
    - This is possible because the atoms can pair up into bosonic molecules or dissociate into individual fermionic atoms depending on the strength of the magnetic field.
- The engine operates in a four-step cycle and it opens up new possibilities for studying **quantum thermodynamics** and its implications for other fields of physics.

## Consanguinity

### Why in News?

Recent studies delve into the **influence of consanguinity** on **genetics** and health. It elucidates how this widespread tradition affects **disease susceptibility and the development of human traits within global populations**.

### What is Consanguinity?

- **Consanguinity** involves both **social and genetic dimensions**. Socially, it means marrying blood relatives, such as **cousins or siblings**, while genetically, it refers to unions between closely related individuals, often termed **inbreeding**.
  - It is a construct that has implications for both **family and population genetics**.

### What are the Key Takeaways from the Studies Related to Consanguinity?

- Approximately **15-20% of the world's population practices consanguinity**, with higher prevalence in regions like **Asia and West Africa**.
  - Some ancient human civilizations, including the **Egyptians and Incas**, are believed to have practiced consanguinity.
  - Genetic evidence suggests that **King Tutankhamun of Egypt** was born to parents who were blood relatives.

- India has more than **4,000 endogamous groups** where people marry within the same caste/tribe or group, making it a fertile ground for consanguinity studies.
- It was found that consanguinity has **increased mortality rates** and the prevalence of **recessive genetic diseases** in populations where it is practiced.

### What are the Benefits and Challenges Related to Consanguinity?

#### ➤ Benefits:

- **Preservation of Cultural and Social Traditions:** In some societies, marrying within the family is a **long-standing tradition that helps preserve cultural and social norms**.
- **Social Safety Net:** Consanguineous relationships can provide a **built-in social safety net**.
  - Relatives are more likely to assist each other during times of **financial, emotional, or medical crises**, reducing the burden on external social services.
- **Reduced Risk of Incompatibility:** In some cases, marrying a close relative may reduce the **risk of incompatibility in terms of cultural, religious, or social backgrounds**. This can lead to more stable marriages.
- **Genetic Improvement in Animal and Plant Breeding Programs:** In controlled breeding settings, mating closely related individuals is a widely used technique to **strategically eliminate harmful genetic traits** and enhance desirable qualities in plants and animals.
  - Through selective breeding, scientists can develop stronger and more productive strains, **leading to better agricultural yields and improved livestock quality**.

#### ➤ Challenges of Consanguinity:

- **Increased Risk of Genetic Disorders:** The most significant challenge of consanguinity is the **increased risk of offspring inheriting genetic disorders** due to the sharing of common recessive genes.
  - Conditions such as **cystic fibrosis** disability are more prevalent among offspring of close relatives.
- **Limited Genetic Diversity:** Marrying close relatives can lead to **limited genetic diversity in the population**, potentially reducing the overall resilience to diseases and environmental changes.

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- **Complex Family Dynamics:** In consanguineous families, complex family dynamics can develop, as multiple roles and relationships intersect.
  - This can lead to conflicts and tensions related to **decision-making and family hierarchies**.
- **Potential Erosion of Individual Autonomy:** In closely-knit consanguineous communities, there can be an **erosion of individual autonomy**, where decisions related to marriage, family planning, and other life choices are heavily influenced by the **family or community**, potentially limiting personal freedom.
- **Silenced Voices in Domestic Violence Cases:** In consanguineous relationships, women may be **discouraged from reporting domestic violence** due to familial and cultural pressures to preserve family respect.
  - This silence can **perpetuate the cycle of abuse**, making it difficult to seek help or intervention in cases of domestic violence.

## India's First CAR-T Cell Therapy Approved

### Why in News?

Recently, the IIT Bombay-incubated company **Immuno Adoptive Cell Therapy** has received **Central Drugs Standard Control Organisation (CDSO)** approval of the first humanized CD19-targeted **Chimeric Antigen Receptor T cell (CAR-T cell) Therapy** product called NexCAR19 (Actalycabtagene autoleucel) for use in cases of relapsed/refractory B-cell Lymphomas and **Leukaemia** in India.

- NexCAR19 is a result of a **decade-long collaborative effort between IIT Bombay** and Tata Memorial Centre (TMC) and has undergone rigorous clinical investigations and translational studies.

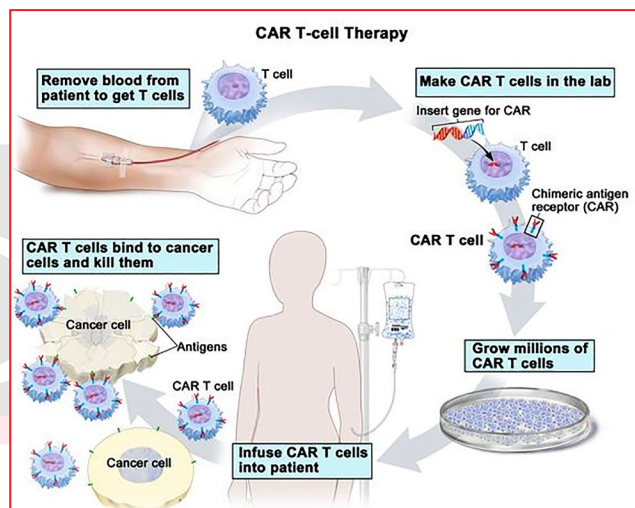
### What is CAR T-cell Therapy?

- **About:**
  - CAR T-cell **therapies are a major breakthrough** in cancer treatment.
  - Unlike chemotherapy or immunotherapy which involve taking drugs, CAR T-cell therapies use a patient's own cells. They are modified in the laboratory to activate T-cells and target tumor cells.

- CAR T-cell therapy has been **approved for leukaemias** (cancers arising from the cells that produce white blood cells) and lymphomas (arising from the lymphatic system).

#### ➤ Procedure:

- T cells are taken from a patient's blood and then **the gene for a special receptor that binds to a certain protein** on the patient's cancer cells is added to the T cells in the laboratory.
  - The special receptor is called a chimeric antigen receptor (CAR). Large numbers of the CAR T cells are grown in the laboratory and given to the patient by infusion.



#### ➤ Significance:

- **CAR T-cell therapies are even more specific than targeted agents** and directly stimulate the patient's immune system to fight cancer, leading to greater clinical efficacy.
  - That's why they're referred to as "living drugs."

#### ➤ Challenges:

- **Preparation:** The difficulty of **preparing CAR T-cell therapies** has been a major hindrance to their widespread use.
  - The first successful clinical trial was published a decade ago, and the first indigenously developed therapy in India was performed in 2021.
- **Side Effects:** In certain kinds of leukaemias and lymphomas, the efficacy is as high as 90%, whereas in other types of cancers it is significantly lower.
  - The **potential side-effects are also significant**, associated with cytokine release syndrome (a widespread activation of the immune system

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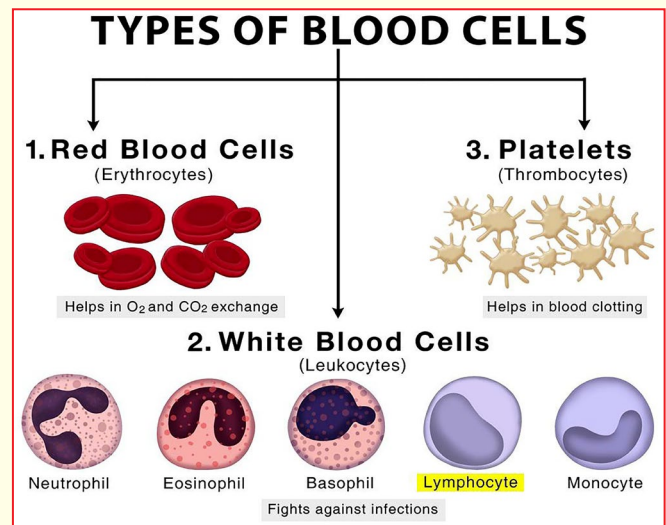
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and collateral damage to the body's normal cells) and neurological symptoms (severe confusion, seizures, and speech impairment).

- **Affordability:** Introduction of CAR T-cell therapy in India can face challenges of cost and value.
  - Critics argue that developing CAR T-cell therapy in India may not be cost-effective as it will still be unaffordable for most people.

#### What are T Cells?

- T cells, also known as **T lymphocytes**, are a type of white blood cell that play a central role in the immune response.
- T cells are involved in **cell-mediated immunity**, which means they help the body recognize and respond to **foreign substances**, such as viruses, bacteria, and abnormal cells, such as cancer cells.
- There are two major **types of T cells**: the **helper T cell** and the **cytotoxic T cell**.
  - As the names suggest, helper T cells 'help' other cells of the immune system, whilst cytotoxic T cells kill virally infected cells and tumors.



#### What are the Government Initiatives Related to Cancer Treatment?

- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke**
- **National Cancer Grid**
- **National Cancer Awareness Day**



Note:



# Environment & Ecology

## Highlights

- Coastal Adaptation
- India Begins Producing Reference Fuel
- Tilapia Parvovirus
- Sikkim Dam Disaster Raises Concerns for India's Bhutan Hydropower Projects
- Ammonia as a Automotive Fuel
- United Nations Convention to Combat Desertification Data
- Interconnected Disaster Risks Report 2023
- Impact of Disasters on Agriculture and Food Security: FAO
- Biomass Co-Firing In Thermal Power Plants
- Implementing Kunming-Montreal Global Biodiversity Framework
- SDG Summit 2023
- Drought in the Amazon Rainforest
- Arabian Leopards and Wolves
- Green Credit Program
- Bio-Decomposer to Address Stubble Burning
- Methane Mitigation to Combat Global Warming
- Large Ozone Hole Detected Over Antarctica

## Coastal Adaptation

### Why in News?

A recent study published in the journal **Nature Climate Change**, has emphasised the **coastal adaptation initiatives** in several regions, encompassing Indian coastal areas such as **Mumbai, Ghoramara in Sunderbans, Puri in Odisha, and the Konkan regions**, categorizing their efforts as 'moderate-to-high' in terms of adaptation measures.

### What are the Key Findings of the Study?

- **Impact on Low-Lying Coastal Regions:**
  - **Low-lying coastal areas**, at risk of flooding, comprise approximately **11% of global population densities** and contribute around **14% to the global Gross Domestic Product (GDP)**.
- **Regional Adaptation Disparities Worldwide:**
  - Close to **50% of surveyed regions** displayed considerable gaps in adaptation, focusing on individual risks while overlooking the root causes of vulnerability.
  - Around **13% of case studies revealed high-to-very-high adaptation**, predominantly witnessed in Europe and North America.
  - The **rest fell into the moderate category**, including Australia and New Zealand.

### ➤ Varying Adaptation Measures in Specific Indian Coastal Regions:

- **Mumbai, Puri, Konkan, and Ghoramara region in Sunderbans**, from India exhibited varying adaptation measures.
- **Ghoramara** displayed generic adaptation plans, **lacking local state-agency-specific strategies**.
- The **Konkan region** also lacked adaptation plans, neglecting multiple coastal hazards in the state's action plan.
- While **Mumbai possesses a climate action plan**, its adaptation strategies failed to accurately evaluate risks and address the specific needs of vulnerable residents.
- Puri, despite having action plans, **lacked sector-specific adaptation strategies** and identification of high-risk communities.

### What is Coastal Adaptation?

#### ➤ About:

- **Coastal adaptation** involves strategies and actions taken to **deal with and reduce the impact of natural hazards and climate change on coastal areas**, aiming to protect communities and infrastructure from **rising sea levels, erosion, and extreme weather events**.
- Additionally, coastal adaptation measures have the potential to create a range of opportunities.

Note:

### ➤ Advantages Resulting from Coastal Adaptation:

- **Economic Diversification:** Implementation of coastal adaptation initiatives can spur economic growth through the **creation of new industries related to climate-resilient infrastructure, renewable energy, and eco-tourism**, potentially generating employment and business opportunities.
- **Biodiversity Enhancement:** Effective coastal adaptation can **inadvertently lead to the restoration and preservation of natural ecosystems**.
  - This restoration aids in **preserving indigenous species** and fostering the development of habitats for endangered or vulnerable species.
- **Disaster Risk Reduction and Resilience Building:** Coastal adaptation plays a crucial role in reducing the vulnerability of coastal communities to disasters.
  - By implementing measures such as **building resilient infrastructure, early warning systems, and natural barriers**, it helps in minimising the impact of natural disasters like storms, **tsunamis**, and sea-level rise.
  - Strengthening coastal resilience reduces the risks associated with such calamities, **safeguarding lives, property, and livelihoods**.
- **Sustainable Food Sources and Livelihoods:** Effective coastal adaptation, especially practices like **aquaculture, sustainable fishing, and integrated farming** in coastal areas, can ensure a **steady supply of seafood and agricultural produce**.
  - This secures livelihoods for coastal communities and contributes to global **food security**.

### ➤ Related Challenges:

- **Complex Stakeholder Coordination:** Coastal adaptation involves multiple stakeholders, including **government bodies, local communities, businesses, and environmental groups**.
  - Coordinating these diverse interests and ensuring effective collaboration among them is **often difficult due to differing priorities**, leading to delays and conflicts.
- **Uncertainty in Future Climate Projections:** Predicting **future climate scenarios**, including sea-level rise and extreme weather events, poses a challenge.
  - Adapting to uncertain climate projections while **planning for long-term strategies can be a complex task**, leading to uncertainties in infrastructure and development planning.

- **Community Fragmentation and Social Cohesion:** In some cases, relocation or changes in land use due to coastal adaptation initiatives can lead to the **fragmentation of communities**.

- Dispersing or **relocating populations might disrupt social structures** and community cohesion, impacting their resilience and cultural practices.

### What are the Indian Government Initiatives Related to Coastal Management?

- The **Ministry of Environment, Forest & Climate Change (MoEFCC)** set the **hazard line for India's coast** to manage shoreline changes due to climate change.
- The **Coastal Regulation Zone Notification, 2019** aims to conserve coastal areas and livelihoods, allowing erosion control measures while defining **No Development Zones**.
- The **Coastal Management Information System (CMIS)** collects near-shore coastal data for designing and maintaining protection structures at vulnerable stretches.
- Successful coastal erosion mitigation measures were demonstrated in **Puducherry and Kerala**, aiding restoration and protection of coastal areas.

## India Begins Producing Reference Fuel

### Why in News?

India has marked a significant milestone in its pursuit of self-reliance, **initiating the production of 'reference' grade petrol and diesel**. It holds the promise of not only catering to domestic requirements but also tapping into the export market.

- Historically, only a select few companies, primarily from Europe and the US, provided reference fuels to India.

### What is Reference Fuel?

- **About:**
  - **Reference fuels (petrol and diesel)**, represent high-value premium products specifically utilized for **calibrating and testing vehicles by automotive original equipment manufacturers (OEMs)** and institutions engaged in automotive testing and certification.

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➤ **Features:**

- They have **higher specifications than regular or premium fuels**. It includes various specifications such as **Cetane number, flash point, viscosity, sulfur and water content, hydrogen purity, and acid number**.
  - For instance, reference grade petrol and diesel feature an **octane number of 97**, exceeding the octane numbers of regular and premium fuels, which stand at **87 and 91**, respectively.

➤ **Indigenous Production by Indian Oil Corporation:**

- India historically depended on imports to fulfill the need for these specialized fuels. However, the **Indian Oil Corporation (IOC)** has now indigenously developed 'reference' grade **petrol at its Paradip refinery in Odisha and diesel at its Panipat unit in Haryana**.
  - Reference gasoline (petrol) fuels will be available in **E0, E5, E10, E20, E85, E100** from Paradip refinery.
  - Reference diesel fuel shall be available in **B7 grade** from Panipat refinery.
- **Benefit:**
  - **Cost Advantage:** The cost of the imported 'reference' fuel stands between **Rs 800-850 per litre**, whereas the domestic production is estimated to lower the cost to around **Rs 450 a litre**, signifying a substantial cost advantage.
  - **Benefit to Vehicle Manufacturers:** This development will provide **minimum lead time for vehicle manufacturers**, enabling import substitution at a better price.

**Note:**

- **E0, E5, E10, E20, E85, E100** refer to different ethanol-gasoline blends. **Ethanol blending** is the process of mixing ethanol with gasoline to create various ethanol-gasoline blends. This blending is aimed at reducing the overall carbon footprint and emissions from gasoline-powered vehicles.
- Diesel B7 is a fuel with added **biocomponents of up to 7%**
- **Octane Number:**
  - It measures the **fuel's resistance to engine knocking**. Higher octane numbers signify better resistance to premature combustion in gasoline.

➤ **Cetane Number:**

- Indicates the **ignition quality of diesel fuel**. A higher cetane number signifies easier ignition.

➤ **Flash Point:**

- It is the lowest temperature at which a substance produces enough vapor to ignite momentarily.

➤ **Viscosity:**

- Measures a **fluid's resistance to flow**; higher viscosity indicates thicker, less fluid-like behavior.

➤ **Acid Number:**

- It is a measurement of the amount of acidic substance in the oil.

## Tilapia Parvovirus

### Why in News?

India has witnessed its first encounter with **Tilapia Parvovirus (TiPV)**, in Tamil Nadu causing a significant impact on the **country's aquaculture**.

- This virus has been reported in **farm-bred tilapia**, a freshwater fish species, and has raised concerns due to its high mortality rates.

### What is Tilapia Parvovirus?

➤ **About:**

- TiPV is a **viral pathogen** that primarily affects tilapia.
- It belongs to the **Parvoviridae family**, known for its small, non-enveloped, single-stranded DNA viruses.

➤ **Emergence and Impact**

- First reported in China in 2019 and Thailand in 2021. India is the third country to report the occurrence of TiPV.
  - TiPV has caused mortality rates ranging from 30% to 50% on fish farms.
  - In laboratory settings, it has led to 100% mortality, highlighting its devastating impact.

➤ **Consequences of TiPV Outbreak:**

- TiPV outbreak can also pose a threat to the biodiversity and ecology of freshwater bodies as tilapia is an invasive species that can compete with native fish for food and space.
- TiPV outbreak can also affect the food security and nutrition of the people who depend on tilapia as a source of protein and income.

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### What are the Key Facts About Tilapia Fish?

#### ➤ About:

- Tilapia is a freshwater fish species that is widely cultured and consumed in India. It belongs to the family **Cichlidae** under the order **Perciformes**.



- These fish are **native to Africa** and have gained popularity as a widely cultivated and harvested food source.
- **Tilapia Farming in India:**
  - Tilapia farming is carried out in various parts of the country, particularly in **Andhra Pradesh and Kerala**.
  - The introduction of different tilapia species, including **Nile tilapia and Mozambique tilapia**, has led to diverse farming practices.
    - Nile tilapia, introduced in the 1970s, is favoured for its **larger size and scale of cultivation**.
    - **Mozambique tilapia**, referred to as “Jilabi” in Tamil, was introduced to Indian freshwater bodies in the 1950s.
      - Mozambique Tilapia is known for its **adaptability to low-oxygen levels in water**. It can survive in a variety of aquatic environments.
  - The Indian government authorized the import of specific tilapia species, namely **Oreochromis niloticus and red hybrids**, in 1970. These species were favored for their **fast growth and market demand**, maintaining a level of control over the aquaculture.

## Sikkim Dam Disaster Raises Concerns for India's Bhutan Hydropower Projects

### Why in News?

The recent **glacial lake outburst flood (GLOF)** in Sikkim has washed away the 1200-MW Teesta-III dam.

- The **National Green Tribunal (NGT)** has issued notices to key stakeholders, including the **National Hydroelectric Power Corporation (NHPC)**, that previously dismissed any GLOF threats.

- The collapse of a dam in Sikkim has raised **concerns over the safety and feasibility of India's hydroelectric projects in Bhutan**, which are vital for meeting the energy needs of both countries.

### Why Did NGT Issue

#### Notices to Teesta-III Dam Stakeholders?

- The NGT has summoned three pivotal stakeholders (the Sikkim government, Sikkim Urja Limited (responsible for Teesta-III), and NHPC) to address the situation.
- NHPC had **previously downplayed the risk of GLOFs in the region**.
- In 2014, when NHPC's 520 MW Teesta-IV project faced a challenge to its **environmental clearance**, NHPC, in an affidavit to the NGT, said that projects below **Chungthang (Teesta-III)** faced no threat from GLOFs.
  - Apparently convinced, the NGT dismissed the appeal against Teesta-IV's environment clearance in 2017.

### What are the Key Facts

#### about Teesta River and Teesta-III Dam?

#### ➤ Teesta River:

- **Teesta river** is a tributary of the **Brahmaputra (known as Jamuna in Bangladesh)**, flowing through India and Bangladesh.
- It originates in the **Himalayas** near Chunthang, Sikkim and flows to the south through West Bengal before entering Bangladesh.
  - Originally, the river continued southward to empty directly into the Padma River (main channel of **Ganga** in Bangladesh) but around 1787 the river changed its course to flow eastward to join the Jamuna river.
- Teesta river water conflict is one of the most contentious issues between India and Bangladesh.
- **Tributaries:** Zemu Chhu, Rangyong Chhu, Rangit River, Lachung Chhu, Chakung Chhu.

#### ➤ Teesta-III Dam:

- It is a **hydroelectric project built on the Teesta River** in Chungthang, Sikkim. India. It has an installed capacity of 1,200 MW. The dam was the highest in Sikkim.
- Impact of the GLOF in Sikkim:
  - The GLOF that occurred in Sikkim washed away the **1200-MW Teesta-III** and caused severe damage to NHPC projects downstream, including the **510 MW Teesta-V and the under-construction 500 MW Teesta-VI**.

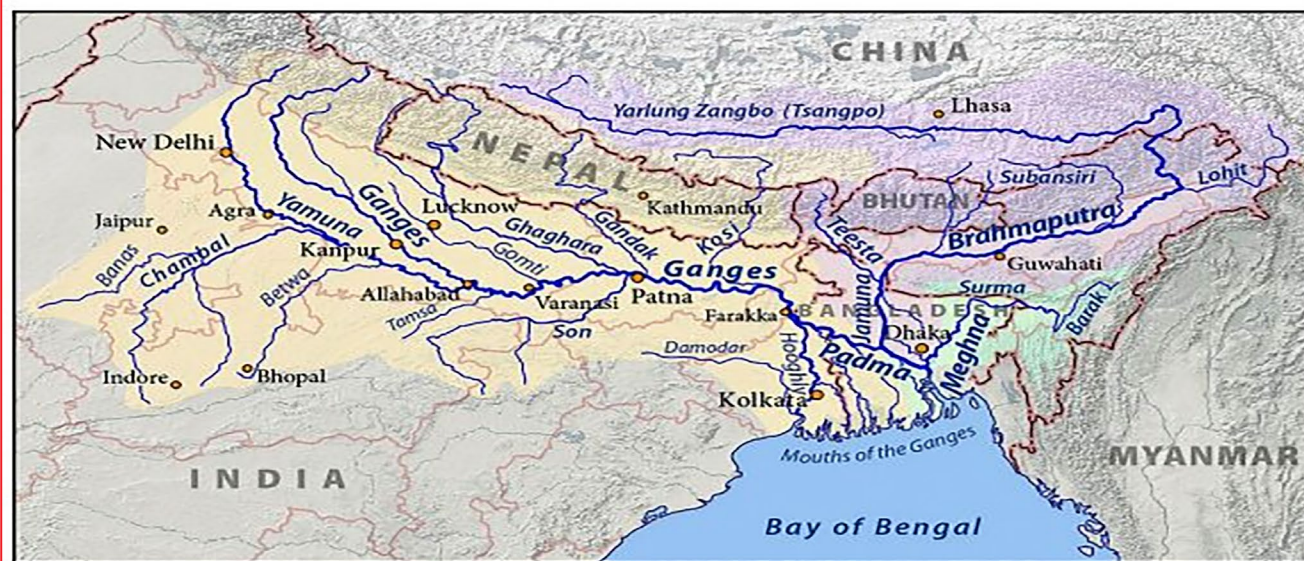
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### The Ganges-Brahmaputra Basin



## Ammonia as a Automotive Fuel

### Why in News?

Recently, an **internal combustion engine** powered by **ammonia** is gaining traction in the **automotive industry**.

- This unique approach is sparking interest as it **explores alternative propulsion technologies** while not completely departing from **traditional Internal Combustion Engine (ICE) systems** or transitioning to **Battery Electric Vehicles (BEVs)**.

### What are ICE Systems and BEV Systems?

- **Internal Combustion Engine (ICE) Systems:**
  - ICE vehicles use traditional engines that burn fossil fuels (e.g., petrol or diesel) to generate power.
    - **Fuel is mixed with air, ignited**, and the resulting explosion drives the vehicle's wheels.
  - They are commonly found in cars, trucks, and motorcycles.
  - They emit exhaust gases and contribute to air pollution and greenhouse gas emissions.
- **Battery Electric Vehicles (BEVs):**
  - **BEVs** are electric vehicles that rely **solely on rechargeable batteries to power an electric motor**.
    - They must be charged using electricity from the grid, which can be generated from various sources, including renewable energy.
  - They produce **zero tailpipe emissions** and are considered environmentally friendly.

### What are the Current Major Applications of Ammonia?

- **About:**
  - **Ammonia** is a chemical compound with the formula **NH<sub>3</sub>**. It is a **colorless gas with a pungent odor** and is widely used in various **industrial, agricultural, and household applications**.
- **Major Application:**
  - **Agriculture:** Key component in the **production of ammonia-based fertilizers**, such as ammonium nitrate and urea, which are essential for crop growth.
  - **Chemical Industry:** Fundamental ingredient in the production of substances like **nitric acid, ammonium sulfate, and various nitrogen-based compounds**.
    - It plays a crucial role in the manufacturing of synthetic fibers as well, like **nylon**
  - **Manufacturing:** As a **refrigerant in industrial refrigeration systems** and air conditioning.
    - Also, ammonia is used in the manufacture of dyes and as a **pH regulator in dyeing processes**.
  - **Household:** An ingredient in **household cleaning products**, including glass and surface cleaners.

### What are the Advantages of Using Ammonia as a Fuel?

- **High Energy Density:** Ammonia has a **high energy density**, which means it **can store and release a significant amount of energy**, making it suitable for long term applications.

Note:

- Ammonia has **9 times the energy density of lithium-ion batteries** and **3 times that of compressed hydrogen**.
- **Low Carbon Emissions:** Ammonia has the potential to produce **near-zero carbon dioxide (CO<sub>2</sub>) emissions during combustion**, making it an environmentally friendly choice, especially when compared to fossil fuels.
- **Bridge Fuel:** Ammonia can serve as a bridge fuel, helping reduce dependence on traditional fossil fuels and offering a **transitional buffer toward cleaner energy sources**.
- Also, using ammonia can enhance a nation's energy security by diversifying the energy mix and reducing reliance on a single energy source.

### What are the Major Challenges

#### Associated with Using Ammonia as a Fuel?

- **Environmental Impact:** Ammonia as a fuel holds the promise of near-zero CO<sub>2</sub> emissions during combustion.
  - But current ammonia engines still emit exhaust gases, including **unburned ammonia and Nitrogen oxides (NO<sub>x</sub>)** that pose risks to environment and health.
    - Nitrogen in the atmosphere usually results in **more tropospheric ozone, respiratory illnesses, and acid rain**.
- **Production Challenges:** The production of ammonia typically relies on the **Haber-Bosch process**, which consumes a significant amount of energy and **relies on fossil fuels**.
  - **Green ammonia production**, which involves using renewable energy and sustainable sources of hydrogen, is still in the early stages of development and **faces cost and scalability challenges**.
- **Toxicity:** Ammonia is highly toxic, posing health risks to humans and the environment if not managed properly.
  - Also, due to its **toxicity and corrosiveness**, accidents or mishandling could have severe consequences.
- **Fuel Quality Standards:** Developing and implementing **consistent quality standards for ammonia as a fuel can be complex**, especially when ammonia is produced from various sources or with varying levels of impurities.

**Note:** The Ministry of Power, Government of India has notified the **Green Hydrogen/ Green Ammonia Policy in February 2022**, which provides various incentives and support measures for the manufacturers of green hydrogen and green ammonia using renewable power.

## United Nations Convention to Combat Desertification Data

### Why in News?

Recently, the **UN Convention to Combat Desertification (UNCCD)** has announced the launch of its **first-ever Data Dashboard**, which shows that Land Degradation is advancing at an astonishing rate across all regions.

- It compiled national reporting figures from 126 countries to provide a comprehensive overview of the **Land Degradation** situation globally.
- The 21<sup>st</sup> session of the UNCCD will take place in Samarkand, Uzbekistan, in November 2023. This session will focus on reviewing global progress towards achieving **Land Degradation Neutrality (LDN)** and addressing related issues.

### What is Land Degradation Neutrality (LDN)?

- LDN is a simple idea and a powerful tool, means to secure **enough healthy and productive natural resources** by **avoiding Degradation** whenever possible and restoring land that has already been degraded.
- At its core are **better land management practices** and better **land-use planning** that will improve economic, social and ecological sustainability for present and future generations.
- LDN provides significant **benefits in terms of mitigation and adaptation to climate change**. Halting and reversing land degradation can transform the **land from being a source of Greenhouse Gas Emissions (GHG)** to a carbon sink, by increasing carbon stocks in soils and vegetation.

### What are the Key Highlights of the UNCCD Data on Land Degradation?

- **Land Degradation Trends:**
  - From 2015 to 2019, the world lost over **100 million hectares** of productive land annually, which is **twice the size of Greenland**.

Note:



drishti

- Land degradation is **worsening rapidly on a global scale.**
- **Regional Variances:**
  - Eastern and Central Asia, Latin America, and the Caribbean experience **severe degradation**, impacting at least **20% of their total land area.**
  - Sub-Saharan Africa, Western and Southern Asia, Latin America, and the Caribbean have **experienced land degradation rates faster than the global average.**
  - In sub-Saharan Africa and in Latin America and the Caribbean, 163 million hectares and 108 million hectares, respectively, have **succumbed to land degradation since 2015.**
- **Bright Spots:**
  - Some countries have shown progress in combating land degradation. For instance, **In sub-Saharan Africa, Botswana reduced land degradation from 36% to 17% of its territory.**
    - The country has **committed a total of 45.3 million hectares to LDN**, including both measures to avoid further degradation as well as restoration interventions in selected land degradation hotspots.
  - In the Dominican Republic, **the proportion of degraded land has decreased from 49% to 31% between 2015 and 2019**, with ongoing efforts to restore 240 000 hectares in the Yaque del Norte River basin and in cocoa production areas in San Francisco de Macoris province.
  - While Uzbekistan reported the highest proportion of degraded land (26.1%) in the Central Asia region, it also saw the largest decrease – **from 30% to 26% compared to 2015.**
    - Between 2018-2022, Uzbekistan carried out saxaul planting to eliminate salt and dust emissions from the **drained bottom of the Aral Sea.**
- **India's Statistics:**
  - Degraded Land Area in India has been increased from **4.42% in 2015 to 9.45 % in 2019.**

### **What are the Recommendations of UNCCD to Achieve LDN Targets?**

- The UNCCD data emphasizes the need to restore 1.5 billion hectares of degraded land by 2030 to achieve LDN targets outlined in the United Nations **Sustainable Development Goals.**

- The UNCCD highlights that although global trends are concerning, it is still possible to **meet or exceed LDN goals through stopping further degradation** and accelerating restoration efforts.
- Many countries have set voluntary LDN targets for 2030, and funding is crucial for these efforts.

### **What is Land Degradation?**

- **About:**
  - Land degradation is caused by **multiple forces, including extreme weather** conditions, particularly drought.
  - It is also caused by **human activities that pollute or degrade** the quality of soils and land utility.
- **Impact:**
  - **Desertification** is a consequence of severe land degradation and is defined as a process that creates arid, semi-arid and dry sub-humid areas.
  - It accelerates **Climate Change** and biodiversity loss, and contributes to droughts, wildfires, involuntary migration and the emergence of **Zoonotic Infectious Diseases.**

### **What are the Efforts to Curb Land Degradation?**

- **Global Efforts:**
  - **The Bonn Challenge:** To bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.
  - **Great Green Wall:** Initiative by **Global Environment Facility (GEF)**, where eleven countries in Sahel-Saharan Africa have focused efforts to fight against land degradation and revive native plant life to the landscape.
- **India's Efforts:**
  - **Integrated Watershed Management Programme (IWMP)** (Pradhan Mantri Krishi Sinchayee Yojana)
  - **The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS),**
  - Soil Conservation in the Catchment of River Valley Project,
  - National Watershed Development Project for Rainfed Areas (NWDPA).
  - **Desertification and Land Degradation Atlas by ISRO (Indian Space Research Organisation).**

Note:



## Interconnected Disaster Risks Report 2023

### Why in News?

Recently, the **release of the Interconnected Disaster Risks Report 2023** has thrust the world's interdependence into the spotlight, **warning of impending global tipping points and underlining the critical need for immediate action** to prevent potential catastrophic consequences.

### What are the Major Findings of the Interconnected Disaster Risks Report 2023?

- **About:** The UN Interconnected Disaster Risks Report is an annual science-based report released by the **United Nations University- Institute for Environment and Human Security (UNU-EHS)**, (first published in 2021).
  - The report analyses **several concrete examples of disasters** each year and explains **how they are inter- connected** with each other and with human actions.
  - The report illustrates how **seemingly stable systems can gradually deteriorate until a critical threshold is crossed**, resulting in catastrophic consequences.
    - It introduces the concept of “**risk tipping points**,” moments when **socio ecological systems** can **no longer buffer risks** and face a heightened risk of catastrophic impacts.

**Note:** The **United Nations University (UNU)** is the academic arm of the **United Nations** and acts as a global think tank. The mission of the **Institute for Environment and Human Security (UNU-EHS)** is to carry out cutting edge research on risks and adaptation related to environmental hazards and global change. The institute is **based in Bonn, Germany**.

- **Tipping Points:** The report highlights that the world is approaching **six environmental tipping points** -
  - **Groundwater Depletion:** **Groundwater** stored in aquifers is vital for over **2 billion people**, with **70% used for agriculture**.
    - However, **21 of the world's major aquifers are depleting faster** than they can recharge.
    - Aquifer water often took thousands of years to accumulate and is essentially non-renewable.

- Over-extraction has occurred in some areas, like **Saudi Arabia**, depleting over **80% of its aquifer**. This forces reliance on imported crops, posing challenges for food security.
- Certain areas within the **Indo-Gangetic basin in India** have already crossed the **critical threshold of groundwater depletion**, and the entire northwestern region is expected to face severely limited groundwater availability by **2025**.
- **Accelerating Species Extinctions:** Human activities like **land use changes, overexploitation, and climate change** have accelerated species extinction.
  - Current extinction rates due to human influence are hundreds of times higher than normal.
  - **Extinction can trigger a chain reaction**, causing the collapse of ecosystems.
- **Mountain Glacier Melting:** Glaciers are vital water sources, but they are **melting at double the rate due to global warming**.
  - Between 2000 and 2019, **glaciers lost 267 gigatons of ice per year**. We are **projected to lose around 50% of glaciers by 2100**, even with limited warming.
  - **90,000+ glaciers** of the **Himalayas, Karakoram and Hindu Kush mountains** are at risk, and so are the nearly 870 million people that rely on them.
- **Space Debris:** **Satellites** are crucial for **weather monitoring, communication, and safety**, but the growing number of satellites in space is causing a **space debris** problem.
  - Only **25% of objects in orbit are active satellites**; the rest are non-functional debris.
    - There are **about 130 million smaller, untrackable debris pieces**.
  - These objects move at high speeds and pose a collision risk to operational satellites, creating a hazardous orbital environment.
- **Unbearable Heat:** Climate change is causing more deadly heat waves. High temperatures and humidity make it hard for the body to cool down.
  - When the “**wet-bulb temperature**” exceeds **35°C** for over six hours, it can lead to **organ failure and brain damage**. This has already occurred in places like **Jacobabad, Pakistan**.
    - Also, during a **2023 heatwave in India**, wet-bulb temperatures went above **34°C**.

Note:



- It is **expected to affect over 70% of the global population by 2100.**
- **Uninsurable Future:** Frequent severe weather is causing a sevenfold increase in damages since the 1970s, with **USD 313 billion in losses in 2022.**
  - **Insurance costs are rising due to climate change,** making coverage unaffordable for many.
  - Some insurers are leaving high-risk areas, leading to regions being labeled **“uninsurable.”**
    - For example, **in Australia,** about 520,940 homes may become uninsurable by 2030 due to increased flood risk.
- **Interconnectedness: Climate change, driven by increased greenhouse gas emissions,** acts as a common driver of tipping points. This includes glacier melting, extreme weather events, and shifts in the insurance risk landscape.
  - These **interconnected environmental issues can trigger feedback loops,** such as rising sea levels from glacier melt, intensifying coastal flooding and elevating the demand for disaster insurance.
  - Ultimately, these tipping points have **significant socioeconomic consequences.**

### **What are the Major Drivers of Increasing Disaster Risks?**

- **Urbanisation:** Rapid Urbanization often occurs without adequate planning and infrastructure development.
  - As cities grow, **more people and property become exposed to hazards like floods and earthquakes,** increasing disaster vulnerability.
- **Environmental Degradation: Deforestation, soil erosion, and pollution** weaken natural ecosystems and reduce their ability to act as buffers against disasters. Environmental degradation amplifies the impacts of hazards.
- **Inadequate and Inefficient Infrastructure:** Insufficiently built or maintained infrastructure, such as bridges, buildings, and roads, can **crumble during disasters,** leading to significant economic and social losses.
- **Poor Land Use Planning:** Inadequate land use planning can result in **communities settling in high-risk areas like floodplains** or wildfire-prone regions. This contributes to increased exposure to disasters.
- **Water Management Issues:** Mismanagement of water resources can lead to **droughts, water scarcity, and flooding.**

- These issues can have far-reaching consequences for food security, economies, and communities.
- **Global Interconnectedness:** As the world becomes more **interconnected, disruptions in one area can have cascading effects globally.**
  - This interconnectedness can propagate the economic and social impact of disasters.

### **What does the Report Recommend as Solutions to Mitigate Disaster Risk?**

- **UN Interconnected Disaster Risks Report 2023** uses the four-category framework to classify and prioritize solutions for addressing disaster risks.
  - **Avoid-Delay:** These are actions that aim to prevent disasters by slowing them down using current methods.
    - For example, implementing **strict building codes and land-use regulations** to prevent major damage from disasters.
  - **Avoid-Transform:** These actions focus on **preventing disasters by making significant changes** in how things are done.
    - For example, transitioning from **fossil fuel-based energy production to renewable energy sources** (like solar and wind) to avoid the risks associated with climate change
  - **Adapt-Delay:** These actions prepare us to handle disasters by buying more time to respond.
    - For example, developing **advanced early warning systems for tsunamis** to buy time for people to evacuate and prepare for the disaster.
  - **Adapt-Transform:** These actions involve **making big changes to how we do things to adapt to disasters.**
    - For example, **implementing coastal zoning policies and restoring natural barrier ecosystems (like mangroves)** to adapt to rising sea levels and transform coastal protection strategies.

#### **What are the Initiatives for Disaster Risk Reduction?**

- **Global:**
  - **Sendai Framework for Disaster Risk Reduction 2015-2030**
  - **The Climate Risk and Early Warning Systems (CREWS)**
  - **International Day for Disaster Risk Reduction - 13<sup>th</sup> October**

Note:

- Green Climate Fund's Sectoral Guide on Climate Information & Early Warning Systems

➤ India's Initiatives:

- Coalition for Disaster Resilient Infrastructure Society (CDRIS)
- National Disaster Management Plan (NDMP)

## Impact of Disasters on Agriculture and Food Security: FAO

### Why in News?

Recently, the **Food and Agriculture Organization (FAO)** has released a report titled 'The Impact of Disaster on Agriculture and Food Security' stating that the frequency of **Extreme Disaster** events has risen significantly over the past 50 years.

- The report estimated losses caused by disasters on agricultural production over the past three decades and delves into the diverse threats and impacts affecting the **crops, livestock, forestry, and fisheries and aquaculture** subsectors.
- It analyzed the complex interplay of underlying risks, such as **Climate Change**, Pandemics, Epidemics and Armed conflicts, and how they drive disaster risk in agriculture and **Agri-food systems** at large.

### What are the Key Highlights of the Report?

- **Magnitude of Agricultural Losses:**
  - Over the last 30 years, an estimated USD 3.8 trillion worth of crops and livestock production has been **lost due to disaster events**.
  - This translates to an average annual loss of USD 123 billion, which is approximately 5% of the global agricultural **Gross Domestic Product (GDP)**.
    - Agriculture is **one of the most highly exposed and vulnerable sectors** in the context of disaster risk, given its **profound dependence on natural resources** and climate conditions.
    - Recurrent disasters have the **potential to erode gains in food security** and **undermine the sustainability** of agrifood systems.
- **Impact on Different Countries:**

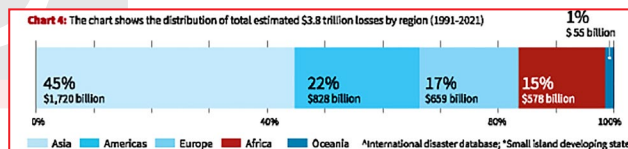
- Disasters have the **highest relative impact on lower and lower middle-income countries**, where they can cause losses of up to 15 % of their total agricultural GDP.
- Small Island Developing States (SIDS) also experience **significant losses, amounting to nearly 7%** of their agricultural GDP.

➤ **Losses by Product Groups:**

- There are increasing trends in losses related to **major agricultural products**.
- Cereals are the **most affected**, followed by **fruits and vegetables** and sugar crops, with average losses of millions of tonnes each year.
- Meats, dairy products, and eggs also show substantial losses.

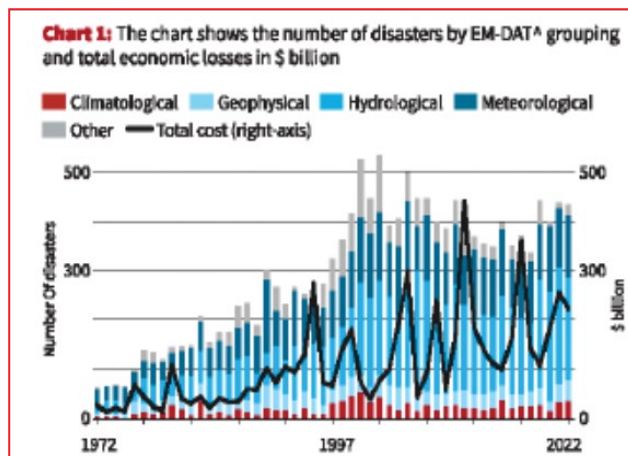
➤ **Regional Differences:**

- Asia experiences the largest share of total economic losses, followed by **Africa, Europe**, and the Americas.
- However, in Asia, these losses account for a smaller percentage of agricultural added value compared to Africa.



➤ **Increasing Frequency of Disasters:**

- Disaster events have been on the rise, increasing from **100 per year in the 1970s to around 400 events** per year worldwide in the past two decades.
- These events are becoming more frequent, intense, and complex, with expected worsening impacts due to climate-induced disasters.



Note:

### ➤ Impact on Vulnerable Groups:

- Small-scale farmers, particularly those practicing **Rain-Fed agriculture**, are the most vulnerable to disaster impacts.
- Supporting the adoption of farm-level disaster risk reduction practices can help reduce losses and enhance resilience.
- Investment in farm-level disaster risk reduction good practices can perform on average **2.2 times better than previously applied practices**.

### What are the Recommendations?

- Proactive and timely interventions, such as anticipatory actions in response to forecasted hazards, can significantly reduce disaster risks in agriculture.
- For every USD 1 invested in anticipatory action, rural families can gain up to USD 7 in benefits and avoided agricultural losses.
- The report outlines **three key priorities for addressing the impact of disasters** on agriculture:
  - Improving data and information on disaster impacts, developing multi-sectoral and multi-hazard disaster risk reduction approaches, and enhancing investments in resilience to reduce disaster risk in agriculture and improve livelihoods.

### What is the Food and Agriculture Organization?

#### ➤ About:

- FAO is a specialised agency of the **United Nations** that leads international efforts to defeat hunger.
  - **World Food Day** is celebrated every year around the world on **16<sup>th</sup> October**. The day is celebrated to mark the anniversary of the founding of the FAO in 1945.
- It is one of the UN food aid **organisations based in Rome (Italy)**. Its sister bodies are the **World Food Programme** and the International Fund for Agricultural Development (IFAD).

#### ➤ Initiatives Taken:

- **Globally Important Agricultural Heritage Systems (GIAHS)**.
- Monitors the **Desert Locust** situation throughout the world.
- The **Codex Alimentarius Commission or CAC** is the body responsible for all matters regarding the implementation of the Joint FAO/WHO Food Standards Programme.

- The **International Treaty on Plant Genetic Resources for Food and Agriculture** was adopted by the Thirty-First Session of the Conference of the FAO in 2001.

### ➤ Flagship Publications:

- The State of World Fisheries and Aquaculture (SOFIA).
- The State of the World's Forests (SOFO).
- **The State of Food Security and Nutrition in the World (SOFI)**.
- The State of Food and Agriculture (SOFA).
- The State of Agricultural Commodity Markets (SOCO).

## Biomass Co-Firing In Thermal Power Plants

### Why in News?

In recent years, the government has tried to tackle the issue of **stubble burning** by bringing the focus on ex-situ mechanisms of handling biomass or **crop residue management (CRM)** such as **biomass co-firing** and **production of bio-CNG**.

- The Centre for Science and Environment (CSE) conducted a survey-based study in 2022 to understand the on-ground progress of the policy implementation on co-firing biomass in **coal-fired thermal power plants in the National Capital Region (NCR)**.

### What Are the Highlights of the Survey Conducted by CSE?

- **Limited Biomass Co-Firing Progress:**
  - The study found that, as of the end of 2022, co-firing was sporadic, with most plants only conducting trial runs. Unfortunately, **the situation has not significantly improved since then. Only three plants reported increased biomass co-firing** from December 2022 to August 2023.
- **Reasons for Delay in Biomass Co-Firing Implementation:**
  - CSE investigated the reasons behind the delay in implementing the mandated 5% co-firing by coal thermal power plants (TPP) in the NCR and adjoining areas.

Note:

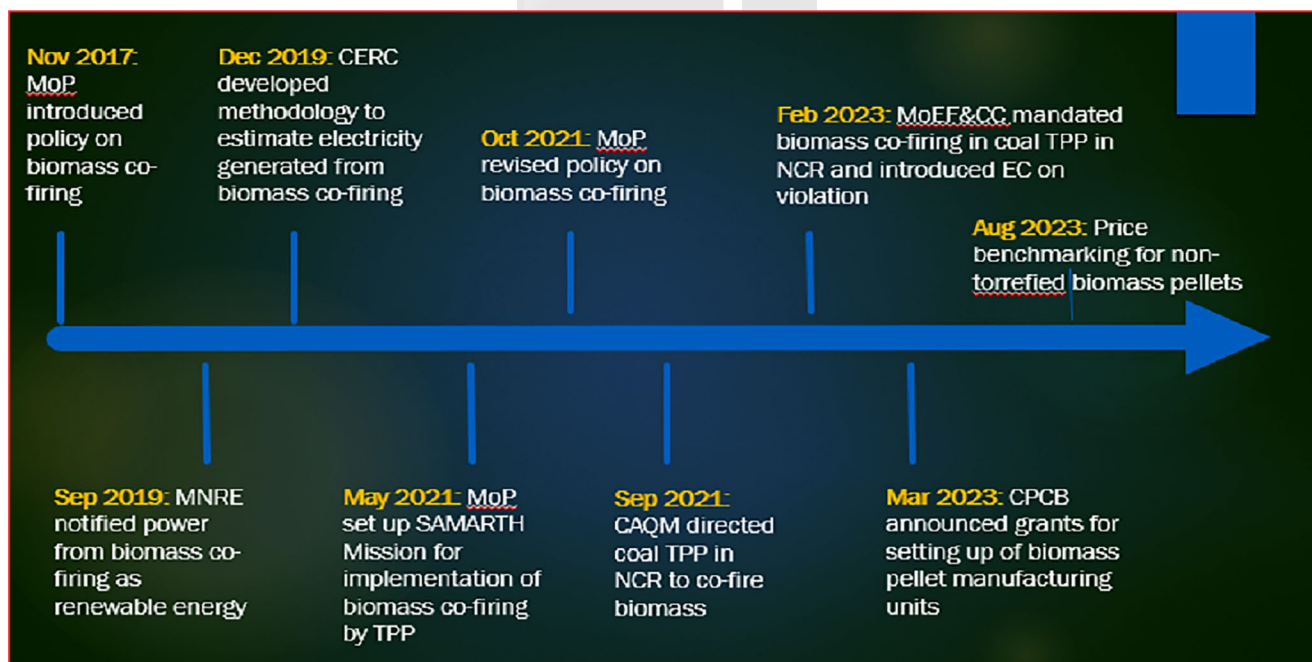
- The **Harduaganj Thermal Power Plant** attributed its success in co-firing biomass to a consistent and affordable biomass supply. However, they **acknowledge that the supply chain needs further strengthening**.
- In contrast, **Haryana Power Generation Corporation Limited (HPGCL)** faced challenges due to **technical limitations and a shortage of torrefied biomass pellet manufacturers**.
- **Mahatma Gandhi Thermal Power Plant** faced technical limitations of only being able to co-fire up to 1.5% biomass pellets instead of 5% as mandated and would **need significant investments to increase biomass co-firing to the mandated level, impacting electricity tariffs**.
- **Talwandi Saboo TPP** struggled to find vendors for its plant due to the absence of established technology for manufacturing torrefied biomass pellets.

#### ➤ Efforts to Overcome Supply Challenges:

- Several plants, like **Indira Gandhi TPP**, have initiated measures to address the supply challenge **by issuing tenders for raw materials to set up in-house pellet manufacturing units and** also explored **partnerships and in-house manufacturing for biomass pellets**.

#### ➤ Challenges in Implementing Biomass Co-Firing for Farm Fire Reduction:

- Despite government directives and efforts to enhance pellet manufacturing capacity, the study suggests that **biomass co-firing may not significantly reduce farm fires**.
- **Timely planning and a coordinated approach, from tendering by coal TPPs to crop residue procurement by pellet manufacturers**, are essential to effectively address stubble burning, which is time-sensitive.



### What is Biomass Co-firing?

#### ➤ About:

- Biomass co-firing is the practice of substituting a part of the fuel with biomass at **coal thermal plants**.
- Biomass co-firing stands for adding biomass as a partial substitute fuel in high efficiency coal boilers.
  - Coal and biomass are combusted together in boilers that have been designed to burn coal.

For this purpose, the existing coal power plant has to be partly reconstructed and retrofitted.

- Co-firing is an option to convert biomass to electricity, in an efficient and clean way, and to reduce **GHG (Greenhouse Gases) emissions** of the power plant.
- Biomass co-firing is a globally accepted cost-effective method for **decarbonising** a coal fleet.

Note:



- India is a country where biomass is usually burnt on the field which reflects apathy towards resolving the problem of clean coal using a very simple solution that is readily available.
- Co-firing **5 to 7% biomass pellets** in thermal power plants can prevent 38 million tonnes of carbon dioxide every year, as per the Finance Minister in the budget speech in 2022.

➤ **Agro Residues for Biomass Pellet Production:**

- The Ministry of Power has identified various surplus agro residues that can be utilized for biomass pellet production. These include:
  - **Crop Residues:**
    - Agro-residues from crops such as Paddy, Soya, Arhar, Gwar, Cotton, Gram, Jawar, Bajra, Moong, Mustard, Sesame, Til, Maize, Sunflower, Jute, Coffee, etc.
  - **Shell Waste:**
    - Waste products like Groundnut Shell, Coconut Shell, Castor Seed Shell, etc.

➤ **Additional Biomass Sources:**

- Bamboo and its by-products, horticulture waste, and other biomass materials like Pine Cone/Needle, Elephant Grass, Sarkanda, etc.

**What are the Government Interventions Related to Biomass Co-firing?**

➤ **Financial Assistance:**

- The MNRE and **Central Pollution Control Board (CPCB)** have introduced Finance Assistance Schemes to support biomass pellet manufacturing units.
- The **Reserve Bank of India (RBI)** has approved 'Biomass pellet manufacturing' as an eligible activity under **Priority Sector Lending (PSL)**, fostering financial viability for such endeavors.

➤ **Procurement and Supply Chain:**

- A dedicated Procurement Provision of Biomass Category has been established on the **Government e-Marketplace (GeM)** portal.
- Ministry of Power has **introduced a Revised Model Long-Term Contract for Biomass Supply**, ensuring a consistent supply chain.
- The provision of **Udyam Aadhaar on the National Single Window System** streamlines administrative processes for biomass-related projects.

- The Udyam Aadhaar registration process is based on the concept of self-declaration, **enabling MSMEs to register themselves for free and obtain the Udyam Aadhaar number.**

## Implementing Kunming-Montreal Global Biodiversity Framework

### Why in News?

Recently, the 25th meeting of the **Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-25)** in Nairobi, Kenya concluded with recommendations aimed at facilitating the transition from agreement to action following the adoption of the **Kunming-Montreal Global Biodiversity Framework (KMGBF)** in December 2022.

- The meeting primarily focused on creating a progress monitoring mechanism, while also addressing the implications of assessments conducted by the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** and the **Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6)**, among other matters.

### What is the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)?

- Article 25 of the **Convention on Biological Diversity** establishes an open-ended **intergovernmental scientific advisory body known as the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)**.
- Its purpose is to provide the Conference of the Parties (COP) and, as appropriate, its other subsidiary bodies, with **timely advice relating to the implementation of the Convention**.

### What Was the Recent SBSTTA-25 Meeting About?

- **IPBES Reports on Invasive Species and Biodiversity Valuation:**
  - The recent IPBES report has highlighted the critical role that **invasive species** play in driving the extinction of plants and animals. Additionally, **the Methodological Assessment Report on Diverse**

Note:

**Values and Valuation of Nature, as well as the Thematic Assessment Report on the Sustainable Use of Wild Species**, were discussed.

- These findings shed light on the intricate relationship between biodiversity and the impact of invasive species.
- **IPCC AR6 Findings on Biodiversity and Climate Change:**
  - The findings from the **IPCC AR6 report** were also a focal point of discussion. The report underscores that climate change is the **primary driver of biodiversity loss and emphasizes the capacity of biodiversity to support climate adaptation, resilience, mitigation, and disaster risk reduction.**
  - This connection between biodiversity and climate change has significant implications for global environmental management.
- **Converging Crises**
  - During the meeting, experts recognized that **biodiversity loss, climate change, ocean acidification, desertification, land degradation, invasive alien species, and pollution** are interconnected crises.
- **Recommendations:**
  - To address these challenges coherently and effectively, **the group finalized 15 key points for**

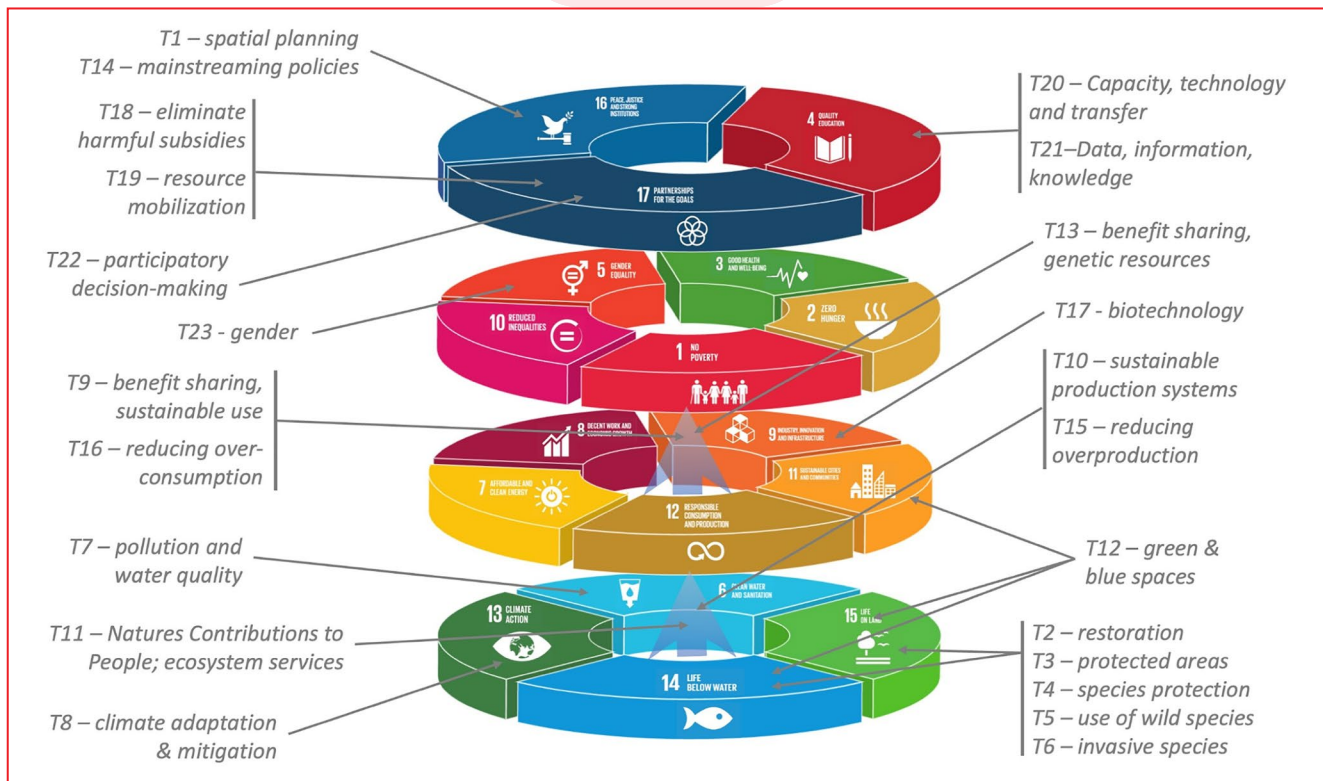
**presentation at the 16th meeting of the Conference of the Parties (COP16) to the Convention on Biological Diversity (CBD).**

- This approach aligns with the goals of the Convention, the Kunming-Montreal Global Biodiversity Framework, and other global initiatives such as the **United Nations Framework Convention on Climate Change** and the **2030 Agenda on Sustainable Development.**
- Moreover, the meeting **emphasized the importance of utilizing the work of other multilateral agencies, including the World Health Organization and the Food and Agriculture Organization**, to enhance scientific and technical guidance in implementing the Kunming-Montreal Global Biodiversity Framework.

### **What is Kunming-Montreal Global Biodiversity Framework?**

#### ➤ **About:**

- The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the fifteenth meeting of the **Conference of the Parties (COP)-15** of CBD following a four year consultation and negotiation process.



Note:

- This historic Framework, which supports the **achievement of the Sustainable Development Goals** and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to reach the **global vision of a world living in harmony with nature by 2050**.
- **30 by 30 Target:**
  - The declaration made a reference to the **'30 by 30'** target which is a key proposal being debated at the **COP15**, that would afford 30% of the Earth's land and oceans protected status by 2030.
- **Main Targets:**
  - The framework consists of **four goals for 2050** and **23 targets for 2030**.
    - The four goals are:

- Conserve and restore biodiversity.
- Ensure sustainable use of biodiversity.
- Share benefits fairly and equitably.
- Enable transformative change.
- **The 23 Targets are:**

#### Kunming Biodiversity Fund

- China has also pledged to inject **USD 233 million** into a new fund to protect biodiversity in developing countries. The fund is being referred to by **China as Kunming Biodiversity Fund**.
- Further, some rich country donors say a new fund for conservation is unnecessary because the **United Nations' Global Environment Facility** already helps developing nations finance green projects.

## SDG Summit 2023

### Why in News?

Recently, the Global leaders expressed apprehension regarding the **slow progress in achieving Sustainable Development Goals (SDGs)** during the SDG Summit in New York, the US.



Note:



## What are the Key Highlights of the SDG Summit 2023?

- **Acknowledging Funding Gap:**
  - The annual SDG funding gap, which was USD 2.5 trillion before the pandemic, has now increased to an **estimated USD 4.2 trillion**, emphasizing the **urgent need for substantial investment in achieving the SDGs**.
- **Addressing the Finance Challenge:**
  - The leaders stressed the **importance of the Addis Ababa Action Agenda (AAAA)** in achieving the 2030 Agenda, emphasizing efficient use of all **financial flows, public and private**, for sustainable development.
  - They called for swift implementation of the **UN Secretary-General's proposal for an SDG stimulus**, a significant increase in funding by USD 500 billion annually.
    - The AAAA is a global framework for financing sustainable development. It aims to discuss and agree upon ways to mobilize **resources and provide the necessary financing for the implementation of the 2030 Agenda for Sustainable Development** and its 17 SDGs.
- **Multilateral Actions and Debt Swaps:**
  - To strengthen SDG implementation, the leaders urged multilateral actions and coordination by all creditors, emphasizing scaling up **Debt Swaps for SDGs**, including climate and nature-related debt swaps.
    - Debt swaps provide opportunities for raising capital in low-income countries to address environmental and other policy challenges and support green growth.
- **Impact of Covid-19:**
  - The declaration acknowledged **that the Covid-19 Pandemic has disproportionately impacted** the SDGs, particularly in the world's poorest and most vulnerable nations. It highlighted the need for an emergency course correction to accelerate progress in achieving the SDGs.
- **Integrating Climate Action and Disaster Risk Reduction:**
  - Leaders recommitted to fully implementing the **Sendai Framework for Disaster Risk Reduction** and pledged to step up efforts to combat climate change.

- They also committed to operationalizing new finance arrangements to respond to loss and damage, aligning with climate goals.
- **Commitment to 2030 Agenda:**
  - The leaders expressed **deep concern about the state of SDGs** at the halfway point of their implementation, highlighting challenges such as poverty, forced relocations, disparities, and the adverse impacts of climate change.
  - Despite these challenges, they recommitted to **fully implementing the 2030 Agenda and 17 SDGs** to protect the rights and well-being of all for a sustainable world.

## What are the Concerns Related to Progress in SDG?

- **Lack of Progress and Commitment:**
  - Despite commitments, the progress towards meeting the 169 targets comprising the 17 SDGs is just 15%, with some areas regressing.
  - The concern is that at the halfway point of the commitment period, there is little confidence in significant progress in the second half.
- **Funding Adequacy and Accessibility:**
  - The investment gap in **achieving the SDGs in developing countries is estimated to be over USD 4 trillion**, significantly higher than earlier estimates, especially with a substantial portion required for the energy transition.
  - This immense financial requirement renders the **SDGs seemingly unachievable, raising questions** about funding adequacy and accessibility.
- **Dis-synergies and Barriers:**
  - Five dis-synergies are identified in **SDG interventions, including resource allocation, creation of enabling environments, co-benefits, cost-effectiveness, and saturation limits**.
  - Various barriers hinder synergistic action, such as knowledge gaps, political and institutional barriers, and economic challenges, inhibiting the full realization of synergies in SDG implementation.
- **Challenges in Policy Implementation:**
  - Inconsistencies and misalignment in **policy implementation pose challenges**, particularly in achieving **renewable energy targets and small-scale applications** due to a lack of integration and clear objectives.

Note:



➤ **Climate Change and Environmental Impact:**

- Climate change is identified as a significant challenge, threatening the achievement of SDG targets. Emissions of greenhouse gasses continue to rise globally, with concerns over vulnerability to climate change impacts.

## **Drought in the Amazon Rainforest**

### **Why in News?**

The **Amazon Rainforest**, often referred to as the “**lungs of the earth**,” is currently facing an unprecedented and **severe drought**.

- This environmental crisis is causing significant disruptions to the **lives of Indigenous people, impacting the entire ecosystem**.

### **What are the Contributing Factors to Drought in the Amazon Rainforest?**

➤ **El Niño Phenomenon:**

- The **El Niño phenomenon** is identified as one of the key drivers of drought in the Amazon.
  - It results in abnormal warming of the **surface waters of the Pacific Ocean**, which subsequently affects rainfall patterns.
- In the Amazon region, El Niño leads to **decreased humidity and reduced rainfall, exacerbating drought conditions**.

➤ **High Water Temperatures in the Northern Tropical Atlantic Ocean:**

- Another weather phenomenon is the unusually high water temperatures in the northern tropical Atlantic Ocean. Due to warmer ocean waters, heated air rises into the atmosphere, which then reaches the Amazon rainforest. The warm air **inhibits the formation of clouds**, causing rainfall to drop sharply.

➤ **Anthropogenic Climate Change:**

- Human-induced climate change is making the situation worse.
  - **Deforestation**, primarily caused by **activities like agriculture and logging**, hampers the Amazon’s ability to regulate climate and retain moisture.

- The destruction of vast areas of vegetation also contributes to rising temperatures, creating a cycle of increasingly severe droughts.
  - This lack of vegetation leads to reduced **evapotranspiration** and, consequently, an increased susceptibility to drought.

➤ **Mining Activity:**

- Unregulated mining activity in the region contributes to the problem by creating **land banks that impede river navigation**.
- The alteration of aquatic and terrestrial ecosystems through mining also releases **pollutants and greenhouse gases into the environment**, further affecting the climate.

➤ **Hydroelectric Dams:**

- The construction and operation of hydroelectric dams in the Amazon, particularly on the **Madeira River** a major **tributary of the Amazon** contribute to drought scenarios.
  - The creation of reservoirs for power generation alters natural river flows and affects aquatic and terrestrial ecosystems.
  - The decomposition of organic matter in these reservoirs releases **methane, a potent greenhouse gas, into the atmosphere**.

➤ **Transportation Infrastructure:**

- The construction of infrastructure, like highways, can have detrimental effects on the rainforest by **cutting through conserved areas**, increasing deforestation,
- and intensifying climate anomalies in the **biome**.

➤ **Impacts on the Water Cycle:**

- All of these factors collectively disrupt the **natural water cycle in the Amazon region**.
  - These lead to a decrease in **water volume in rivers**, prolonged droughts, and negative consequences for **aquatic fauna, riparian habitats, and local communities dependent on these water resources**.

### **What are the Impacts of the Drought Caused in Amazon Rainforest?**

- The drought has caused water levels to drop drastically in many rivers, including the **Rio Negro** a **tributary of the Amazon, one of the world’s largest rivers by discharge levels**, which has fallen to a record low level.

Note:



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- This has left tens of thousands of people stranded in remote jungle villages, with **limited access to food, drinking water, medicine, and other supplies**.
  - Some communities have reported outbreaks of diseases such as **diarrhoea and skin infections due to the contaminated water**.
- The drought has also affected the biodiversity and wildlife of the rainforest. Hundreds of fish and **Amazon river dolphins** also known as **boto or pink river dolphin**, have been found dead, their rotting

carcasses polluting the water. Many animals are also suffering from hunger and thirst, as their habitats and food sources are shrinking.

- The drought has also increased the **risk of forest fires**, which have reached a record high in some areas.
  - The fires have destroyed large swathes of vegetation, released huge amounts of **carbon dioxide into the atmosphere**, and created a thick haze of smoke that has worsened the air quality and visibility in many cities.

### Amazon Rainforest

- These are large tropical rainforests occupying the **drainage basin of the Amazon River** and its tributaries in northern South America and covering an area of 6,000,000 square km.
  - The Amazon Basin supports the **world's largest rainforest**, which accounts for more than half the total volume of rainforests in the world.
- Comprising about **40% of Brazil's total area**, Peru, and also parts of Guyana, Colombia, Ecuador, Bolivia, Suriname, French Guiana, and Venezuela, the **Amazon River Basin is the world's largest drainage system**.
- It is bounded by the **Guiana Highlands** to the north, the **Andes Mountains** to the west, the **Brazilian Central Plateau** to the south, and the **Atlantic Ocean** to the east.
  - Tropical forests are closed-canopy forests growing within 28 degrees north or south of the equator.
  - They are very wet places, receiving more than 200 cm of rainfall per year, either seasonally or throughout the year.
  - Temperatures are uniformly high - between 20°C and 35°C.

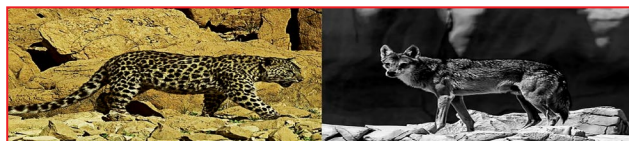


## Arabian Leopards and Wolves

### Why in News?

At present times, both the **Arabian wolf** and **Arabian leopard** are **critically endangered**, with the leopard having lost 98% of its historical range and is believed to be extinct in its northern range, including the **Negev and Judean deserts**.

**Dhib and Nimr:** Dhib and Nimr are the Arabic terms for the two animals (wolf and leopard respectively).



### What are the Characteristics of the Arabian Leopards and Wolves?

- **Arabian Wolves:**
  - **About:**
    - The **Arabian wolf (*Canis lupus arabs*)**, is a subspecies of the gray wolf. The Arabian wolf

Note:

holds the distinction of being the **world's smallest wolf**, making it a unique and significant part of the region's wildlife.

#### ○ Geographical Spread:

- These wolves are native to the **Arabian Peninsula**, including regions such as the **Negev Desert in southern Israel and parts of the Middle East**.

#### ○ Significance:

- In the Negev Desert and Arava Valley of southern Israel, **the Arabian wolf remains a resilient apex predator, playing a vital ecological role**. These wolves are adapted to life in arid environments with limited productivity.
- Arabian wolves are known to **"suppress" populations of smaller canids like jackals and foxes**, helping to regulate the ecosystem in the Negev Desert.
- These wolves are a crucial part of the desert ecosystem and contribute to **maintaining herbivore populations and consuming carrion**, which underscores their ecological importance.

#### ➤ Arabian Leopards:

##### ○ About:

- The Arabian leopard (*Panthera pardus nimr*), is another iconic but **critically endangered species** native to the Arabian Peninsula. These leopards were historically found in various parts of the Arabian Peninsula, including the Negev and Judaeen deserts.

##### ○ Geographical Spread:

- Unfortunately, the status of the Arabian leopard in these regions is dire. A recent study published in 2023 reported that the Arabian leopard has **lost most of its historical range**, and its populations have become highly isolated and fragmented.
- In the Negev and Judaeen deserts, **this species is considered extinct in its entire northern range**.

#### ➤ Conservation Efforts for Both Arabian Wolves and Leopards:

- From an ecological perspective, it would **require adequate prey availability, suitable habitat, and protection from human persecution**.
- However, the **competition between wild and domestic prey, overgrazing of vulnerable vegetation, and conflicts with herders pose significant challenges**.

- Efforts are being made to **increase tolerance and coexistence with Arabian wolves, especially in pastoralist landscapes**. Education about the ecological role of these wolves is being promoted.
- It is recommended to **reduce hunting rates, not only of wolves but also of their prey**, to support the recovery of the wolf's natural prey base.

### What is the Present

#### Context of these two animals?

- Moreover, the ongoing conflicts in the region, such as those between **Israel and Palestine**, could further complicate conservation efforts for the Arabian leopard.
- The response of large carnivores like leopards to armed conflicts can vary, and **cooperation between different sectors is essential for successful conservation**.
- Conservation efforts could potentially serve as a means to **build bridges between human groups in conflict**, promoting the shared conservation of natural heritage.

## Green Credit Program

### Why in News?

The government has recently unveiled an innovative and voluntary **Green Credit program** designed to **reward and incentivize individuals** and entities for their positive **environmental contributions**.

- Participants can earn Green Credits for a wide range of activities that promote environmental sustainability.

### What is Green Credit?

#### ➤ About:

- **Green Credit** refers to a unit of **incentive** provided to individuals and entities engaged in activities that deliver a **positive impact on the environment**.
  - It is a voluntary program initiated by the government to **incentivize various stakeholders in contributing to environmental preservation and sustainable practices**.
- This program is part of the broader **'LiFE' campaign (Lifestyle for Environment)**, and it encourages and rewards voluntary environmentally-positive actions.

#### ➤ Covered Activities:

- The Green Credit program encompasses **eight key types of activities** aimed at enhancing environmental sustainability:

Note:



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- **Tree Plantation:** Planting trees to increase **green cover** and combat deforestation.
  - **Water Management:** Implementing strategies to efficiently manage and conserve water resources.
  - **Sustainable Agriculture:** Promoting eco-friendly and sustainable agricultural practices.
  - **Waste Management:** Implementing effective **waste management** systems to reduce environmental pollution.
  - **Air Pollution Reduction:** Initiatives aimed at reducing **air pollution** and improving air quality.
  - **Mangrove Conservation and Restoration:** Protecting and restoring **mangrove ecosystems** for ecological balance.
- **Earning and Calculation of Green Credit:**
- To earn Green Credits, participants need to register **their environmental activities through a dedicated website**. The activities will then be subject to verification by a designated agency.
    - Based on the agency's report, the administrator will grant the applicant a certificate of Green Credit.
  - The calculation of Green Credit is determined by factors such as **resource requirements, scale, scope, size, and other relevant parameters** necessary to achieve the desired environmental outcomes.
- **Green Credit Registry and Trading Platform:**
- A critical component of the program is the establishment of a **Green Credit Registry**, which will help track and **manage earned credits**.
  - Additionally, the administrator will create and maintain a trading platform, enabling the **trading of Green Credits on a domestic market**.
- **Independence from Carbon Credits:**
- It is important to note that the **Green Credit program operates independently of the carbon credits** provided under the **Carbon Credit Trading Scheme, 2023**, which is governed by the **Energy Conservation Act of 2001**.
  - An environmental activity generating **Green Credits may have climate co-benefits**, such as **reducing or removing carbon emissions**, which can potentially lead to the acquisition of carbon credits in addition to Green Credits.

**Note:** A **carbon credit** is a unit of exchange that can be used to **offset greenhouse gas emissions**. One carbon credit is equivalent to **one metric ton of carbon dioxide or equivalent greenhouse gases** removed from the atmosphere.

- The concept of carbon credit originated from the **Kyoto Protocol**.

### **What are the Concerns Regarding Greed Credit Programme?**

- **Verification and Validation Complexity:** The process of verifying and validating environmentally-positive actions can be **complex and time-consuming**.
  - Concerns exist regarding the administrative burden on both participants and regulatory bodies.
- **Risk of Greenwashing:** There is a risk that **some participants may engage in greenwashing**, where they falsely claim environmentally-friendly activities to earn Green Credits without genuinely contributing to environmental conservation.
- **Compatibility with Carbon Credits:** While the program is intended to be independent of carbon credits, there are **concerns about potential overlaps** and the complexity of evaluation between the two types of environmental credits.
- **Accounting for Regional Differences:** The program may **struggle to account for regional variations in environmental impact**, making it challenging to establish uniform credit values for diverse geographical areas.

### **What are the Other Government Initiatives to Promote the Green Economy?**

- **Sovereign Green Bond**
- **Green Energy Corridor**
- **National Green Hydrogen Mission**

## **Bio-Decomposer to Address Stubble Burning**

### **Why in News?**

Recently, the Delhi Government has initiated the spraying of a **Bio-Decomposer** to tackle **Stubble Burning**. However, the effectiveness of the microbial solution largely depends on its **timing of application**, according to farmers.

Note:



- Stubble burning in Delhi is not a **major contributor to its pollution levels**, with a minimal number of instances reported in recent years.

### **What is the Issue of Stubble Burning?**

- **About:**
  - **Stubble (parali) burning** is a method of **removing paddy crop residues** from the field to sow wheat from the **last week of September to November**, coinciding with the withdrawal of **Southwest Monsoon**.
  - Stubble burning is a **process of setting on fire the straw stubble**, left after the harvesting of grains, like paddy, wheat, etc. It is usually required in areas that use the combined harvesting method which leaves crop residue behind.
  - It is a common **practice in October and November across North West India**, but primarily in Punjab, Haryana, and Uttar Pradesh.
- **Effects of Stubble Burning:**
  - **Pollution:** Emits large amounts of toxic pollutants in the atmosphere which contain harmful gases like **methane (CH<sub>4</sub>)**, **Carbon Monoxide (CO)**, **Volatile Organic compounds (VOC)** and carcinogenic polycyclic aromatic hydrocarbons.
    - These pollutants disperse in the surroundings, may undergo a physical and chemical transformation and eventually adversely affect human health by causing a thick blanket of smog.
  - **Soil Fertility:** Burning husk on the ground destroys the nutrients in the soil, making it less fertile.
  - **Heat Penetration:** The heat generated by stubble burning penetrates into the soil, leading to the loss of moisture and useful microbes.
- **Alternatives to Stubble Burning:**
  - **In-Situ Treatment of Stubble:** For example, crop residue management by zero-tiller machine and Use of bio-decomposers.
  - **Ex-Situ (off-site) Treatment:** For example, Use of rice straw as cattle fodder.
  - **Use of Technology:** For example Turbo Happy Seeder (THS) machine, which can uproot the stubble and also sow seeds in the area cleared. The stubble can then be used as mulch for the field.

### **What is Bio-Decomposer to Tackle Stubble Burning?**

- **About:**
  - Biodecomposer is designed to accelerate the **natural decomposition process of crop residues**.
  - It is typically a **concoction of various microorganisms** like **fungi, bacteria, and enzymes** that work together to **break down the plant material** into organic matter that enriches the soil.
  - Examples:
    - **Bacteria:** Bacillus, Clostridium, E. coli, Salmonella
    - **Fungi:** Mushrooms, Molds, Yeasts
    - **Earthworms**
    - **Insects:** Beetles, Flies, Ants, Maggots
    - **Arthropods:** Millipedes, Woodlice
- **Pusa-Biodecomposer:**
  - It is a **fungi-based liquid solution** that can soften **hard stubble** to the extent that it can be easily mixed with soil in the field to act as compost.
    - The fungi thrive at 30-32 degree Celsius, which is the temperature prevailing when paddy is harvested and wheat is sown.
  - It produces enzymes to digest cellulose, lignin and pectin in paddy straw.
    - It is developed by the **Indian Council of Agricultural Research (ICAR)** and named after **ICAR's campus at Pusa in Delhi**.
  - It rapidly **converts crop residues**, animal waste, dung and other waste into organic manure.
- **Benefits:**
  - The decomposer **improves the fertility and productivity** of the soil as the stubble works as manure and compost for the crops and lesser fertiliser consumption is required in the future.
  - It is an efficient and **effective, cheaper, doable and practical technique** to stop stubble burning.
  - It is an eco-friendly and environmentally useful technology and will contribute to achieving the **Swachh Bharat Mission**.
- **Efficacy:**
  - The microbial solution aims to decompose paddy straw left in the field post-harvest. It needs to be sprayed after harvest, ploughed into the soil, and **lightly irrigated for the stubble to decompose over a period of 20-25 days**.

Note:

- Farmers have emphasized the importance of aligning the spraying process with the timing of **harvest to maximize the effectiveness of the decomposer**.
- Factors like crop rotation, labor availability, and the type of crop grown **affect the relevance and usability of the decomposer** for farmers.
- The effectiveness of the microbial solution is also **dependent on weather conditions**, with less rain in September and October favoring its application.

#### What are the Other Initiatives to Tackle Stubble Burning?

- The State Governments of Punjab, National Capital Region (NCR) States and the Government of National Capital Territory of Delhi (GNCTD) have developed **detailed monitorable action plans** based on the framework by the Commission for Air Quality Management (CAQM) to tackle the problem of air pollution.

## Methane Mitigation to Combat Global Warming

### Why in News?

Recently, a new report titled “**The Imperative of Cutting Methane from Fossil Fuels**” released jointly by the **International Energy Agency**, the **United Nations Environment Programme (UNEP)** and the **UNEP-convened Climate and Clean Air Coalition**, emphasizes the significance of targeted **methane** mitigation to combat global warming.

### What are the Key Findings from the Report?

- **Methane Emissions and Global Warming:**
  - Mitigating methane emissions is essential to **limit global warming to 1.5°C above pre-industrial levels**.
    - Methane is a highly potent greenhouse gas responsible for about 30% of global warming since the **Industrial Revolution**.
  - These efforts could prevent approximately **0.1°C of warming by 2050**.
- **Current Methane Emission Scenario:**
  - Globally, approximately **580 million tonnes of methane** are emitted annually.
    - **Human activities contribute to 60%** of these emissions.

- **Fossil fuel** operations alone were responsible for **about 120 million tonnes of methane emissions in 2022**.
- Under current trajectories, total **anthropogenic methane emissions** could rise by up to **13% between 2020 and 2030**.
- **Need for Targeted Methane Mitigation:**
  - Even with deep cuts in **fossil fuel** use, not addressing methane could lead to **global temperatures exceeding 1.6°C by 2050**.
  - Targeted methane mitigation measures are imperative and should complement **decarbonization efforts**.
    - Existing technologies can help avoid **over 80 million tonnes of annual methane emissions from fossil fuels by 2030**.
    - These solutions are estimated to be cost-effective, often at low or even negative cost.
  - Around **USD 75 billion is required by 2030** for all methane reduction measures in the oil and gas sector in the **Net Zero scenario**.
    - Actions such as eliminating **routine venting and flaring and repairing leaks** are a must to reducing methane emissions from the energy sector and for this, the organisations called for appropriate regulatory frameworks.
  - Most measures can and should be financed by the **industry itself**, but a number of **low- and middle-income countries may face barriers** to accessing capital for some interventions, which may not be implemented without concessional financing.
- **Economic and Health Benefits:**
  - Methane is the **primary reason for ground-level ozone pollution** and mitigation efforts will help prevent “**nearly one million premature deaths through 2050**, which is equivalent to the current population of Amsterdam, Netherlands”.
  - Achieving methane reduction targets will result in the prevention of **95 million tonnes of crop losses** for wheat, rice, soy and maize (corn).
    - These savings are equivalent to roughly 60% of the volume of wheat, rice, soy and maize produced in Africa in 2021.
  - Avoiding such losses of crops, labour and forestry will “provide direct economic benefits valued at more than USD 260 billion between 2020 and 2050”.
- **Regulatory Frameworks:**
  - Appropriate regulatory frameworks are crucial for effective methane reduction.

Note:



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### What is Methane?

#### ➤ About:

- Methane is the simplest hydrocarbon, consisting of one carbon atom and four hydrogen atoms (CH<sub>4</sub>).
  - It is flammable and is used as a fuel worldwide.
- Methane is a **powerful greenhouse gas (GHG)**, which has an atmospheric lifetime of **around a decade** and affects the **climate for hundreds of years**.
- Methane has more than 80 times the warming power of carbon dioxide over the first 20 years of its lifetime in the atmosphere.
- The common sources of methane are oil and natural gas systems, agricultural activities, coal mining and wastes.

#### ➤ Initiatives to Tackle Methane Emissions:

- **India:**
  - **Harit Dhara (HD).**
  - **BS VI Emission Norms.**
  - **National Action Plan on Climate Change (NAPCC).**
- **Global:**
  - **Methane Alert and Response System (MARS).**
  - **Global Methane Pledge.**

## Large Ozone Hole Detected Over Antarctica

### Why in News?

Satellite measurements over **Antarctica** have revealed a massive **ozone hole**, or “ozone-depleted area,” stirring concerns. The **European Space Agency’s Copernicus Sentinel-5P** satellite captured this significant anomaly.

- While it is not likely to **exacerbate warming on the surface of Antarctica**, this phenomenon raises questions about its **causes and potential ties to climate change**.

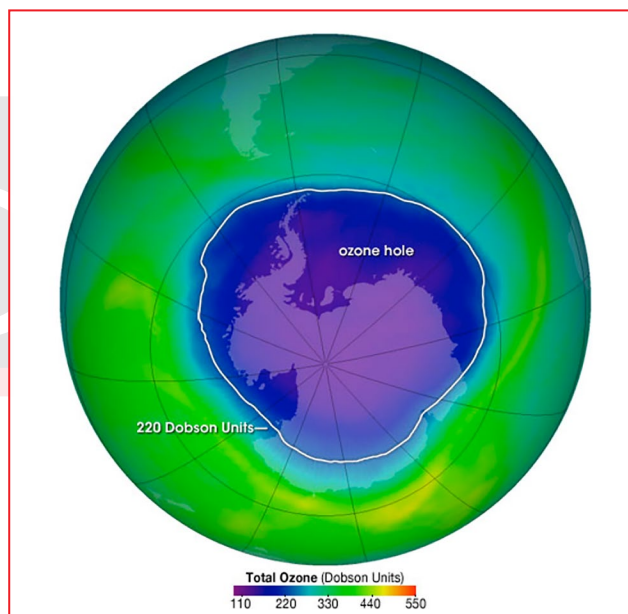
#### What is the Ozone Layer?

- The ozone layer, **found in the stratosphere (good ozone)**, acts as a protective gas shield that **absorbs harmful ultraviolet (UV) radiation**, safeguarding us from the adverse effects of excessive UV exposure.
- **Skin cancer rates** are significantly influenced by UV radiation, underscoring the importance of preserving the ozone layer.

### What is an Ozone Hole?

#### ➤ About:

- An ozone hole is a **region of the stratosphere over Antarctica** where the **ozone layer is exceptionally depleted**.
  - The ozone hole is **not technically a “hole” where no ozone is present**. Scientists use the word hole as a metaphor for the area in which ozone concentrations drop below the **historical threshold of 220 Dobson Units**.
- The size of the **ozone hole over Antarctica varies from year to year**, typically **opening in August** and **closing by November or December**.
  - This annual fluctuation is driven by unique climatic conditions over the region.



#### ➤ Mechanism Behind Ozone Hole:

- The opening of the **ozone hole is a result of the Earth’s rotation**, which generates specific winds over the enclosed landmass of Antarctica.
  - The **polar vortex**, a **band of strong winds around the poles**, plays a vital role in ozone hole dynamics.
- During winter, polar vortex forms due to temperature differences and acts as a **protective barrier**, keeping **polar air separate from warmer, lower-latitude air**.
  - This isolation creates a cold environment for **polar stratospheric clouds (PSCs)**, which trigger **ozone-depleting reactions**.
    - The chemical reactions that occur on the surface of PSCs are responsible for the activation of chlorine and bromine

Note:

compounds. These compounds, particularly chlorine, are **catalysts in ozone-depleting reactions**. When exposed to sunlight, they trigger the breakdown of ozone molecules.

- The **size and strength of the polar vortex directly impact ozone depletion**. When it weakens in spring, mixing with warmer air from lower latitudes **gradually closes the ozone hole**, replenishing the ozone layer.

#### ➤ Cause of the Ozone Hole in 2023:

- Scientists suspect that the substantial ozone hole observed in 2023 may be attributed to **volcanic eruptions in Tonga** during **December 2022 and January 2023**.
- Unlike conventional volcanic eruptions, which generally release gasses confined to the lower atmosphere, this **eruption propelled a significant amount of water vapor into the stratosphere**.
  - This water vapor, in addition to other ozone-depleting elements like **bromine and iodine**, impacted the ozone layer through chemical reactions, altering its heating rate.

**Note:** While the Antarctic ozone hole in 2023 is likely linked to a natural event, it's essential to acknowledge that in the **1970s**, human activities, specifically the widespread use of **chemicals called chlorofluorocarbons (CFCs)**, were responsible for significant ozone depletion.

- The use of these gasses as **propellants in aerosol cans** released chlorine into the stratosphere, contributing to ozone depletion.

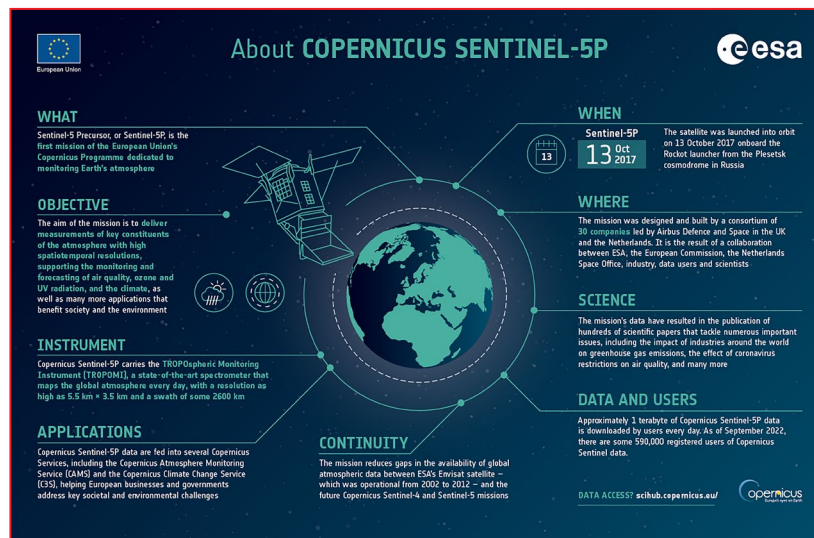
#### ➤ Ozone Holes and Climate Change:

- Ozone depletion is not considered a **primary driver of global climate change**. However, there are indications that rising global temperatures may influence the behavior of ozone holes.
- Recent instances of significant ozone holes have been linked to climate change, particularly the **occurrence of wildfires**.
- The increased frequency and intensity of wildfires, **often fueled by climate change**, inject more **smoke into the stratosphere**, potentially contributing to further ozone depletion.
- While ozone holes may have a **cooling effect**, reducing the **greenhouse gas effect**, (the loss of ozone means slightly more heat can escape into space from that region), they can also **alter the progression of seasons**, leading to **prolonged wintertime conditions**.

**Note:** In response to the ozone depletion crisis, the international community recognized the need for action, leading to the **Vienna Convention in 1985** and the subsequent **Montreal Protocol in 1987**.

- **World Ozone Day (16<sup>th</sup> of September)** is observed every year to commemorate the signing of the Montreal Protocol.

### What is Copernicus Sentinel 5P Satellite?



Note:



# Security

## Highlights

- Need for a National Crisis Management Response Framework
- Smart Fencing System Along India-Myanmar Border
- Puri Jagannath Temple's Ratna Bhandar
- Art and Culture
- Odhuvars in Tamil Nadu

## Need for a National Crisis Management Response Framework

### Why in News?

In light of the recent **attack in Israel**, India's **National Security Guard** Director has stressed the importance of building a crisis management response framework for extreme terrorist scenarios.

### What is the Need for a National Crisis Management Response Framework?

#### ➤ Preparedness for Unpredictable Threats:

- Extreme terrorist scenarios often unfold with little warning, necessitating a well-defined preparedness strategy.
- A crisis management framework ensures that authorities are equipped to handle **unexpected security challenges**.
  - Coordination among various agencies, both at the **federal and state levels, is crucial in countering terrorism effectively**.
- The framework will establish clear protocols for collaboration and communication during crises.

#### ➤ Mitigating Impact:

- Rapid and well-coordinated responses can significantly reduce the impact of terrorist incidents, minimizing casualties and damage.
- A structured crisis management framework provides guidance on mitigation strategies.

#### ➤ Safeguarding Critical Infrastructure:

- Terrorists frequently target critical infrastructure, endangering national security.

- The framework should incorporate measures to **protect vital infrastructure during a crisis**, ultimately enhancing **national security** by comprehensively addressing extreme terrorist scenarios.
- This framework will be a crucial component of the nation's security infrastructure, ensuring resilience against evolving threats.

#### ➤ Enhancing Counterterrorism Capabilities:

- The framework encourages continuous **training and skill development for personnel** involved in counterterrorism efforts.
- Ongoing investment in skills and capabilities ensures that responders remain at the forefront of their craft.
- The framework should acknowledge the synergy between **advanced technology and highly skilled personnel**. However, it's the combination of individuals and weaponry that ultimately makes the decisive difference, despite technological advancements.

#### ➤ Border Security Challenges:

- India's immense landmass and its strategic location in Southern Asia give rise to significant security concerns.
- India's 7,683 km coastline and a vast **Exclusive Economic Zone (EEZ)** necessitate robust **maritime security measures**.
- With over **15,000 km of land borders** shared with seven countries, including challenging borders with **China and Pakistan**, the demand for **effective border management is paramount**.
- Porous borders and challenging terrain add complexity to security. Issues include cross-border **terrorism, militant infiltration/exfiltration**, and the rise of non-state actors.

Note:

- The above-mentioned challenges underscore the need for a comprehensive national crisis management framework.



### What is the National Security Guard?

- **About:**
  - NSG is a Federal Contingency World Class Zero Error Force that deals with **anti-terrorist activities** in all manifestations.
  - The NSG is a Force specially equipped and trained to deal with specific situations and is therefore, to be used only in exceptional circumstances to thwart serious acts of terrorism.
  - NSG formally came into existence in **1986 by an act of Parliament- 'National Security Guard Act, 1986'.**
- **Vision:**
  - A World Class Zero Error Force.
- **Mission:**
  - "Train, equip, and maintain in readiness a special force capable of swiftly and effectively combating terrorism to uphold its motto of '**Sarvatra Sarvottam Suraksha**'.
- **Functioning:**
  - It operates under the **Ministry of Home Affairs** and is a task-oriented force that has two complementary elements in the form of
    - **Special Action Group (SAG)** comprising of the Army personnel- is the main offensive or the strike wing of the NSG, and
    - **Special Ranger Groups (SRG)** comprising of personnel drawn from the Central Armed Police Forces/State Police Forces. They generally handle VIP securities.

- The head of **NSG- designated as Director General (DG)**, is selected and appointed by the Minister of Home Affairs.

#### ➤ Operations undertaken:

- **Operation Black Thunder** (Golden Temple, Amritsar, 1986 & 1988).
- **Operation Ashwamedh** (Indian Airlines Flight-IC427 hijacking, India, 1993).
- **Operation Thunderbolt or Vajra Shakti** (Akshardham Temple attack, Gujarat, 2002).
- **Operation Black Tornado** (Mumbai Blasts, 2008).
- Operation Dhangu Suraksha, Pathankot, 2016.

#### ➤ NSG Headquarters: Manesar, Gurugram

## Smart Fencing System Along India-Myanmar Border

### Why in News?

The Ministry of Home Affairs (MHA), in its **2022-23 annual report**, has introduced a plan to build a **100-kilometer Smart Fencing System (SFS)** along the **India-Myanmar border**.



### What is a Smart Fencing System?

- **About:**
  - An SFS is a technologically advanced **border security infrastructure** designed to enhance **surveillance and control along sensitive border areas**.
  - It typically includes a combination of **physical barriers, sensors, cameras, and communication systems**.

Note:



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- The term “smart” refers to the system’s ability to use technology for monitoring and responding to border threats effectively.

➤ **Need for SFS along the India-Myanmar Border:**

○ **Ethnic Violence and Insurgency:**

- **Ethnic violence** has been a significant concern in Manipur, resulting in the tragic **loss of over 175 lives since May 3, 2022**. Manipur has witnessed as many as 137 **insurgency-related incidents** out of the total 201 recorded in the northeastern states in 2022.
- Manipur is affected by the activities of **Meitei, Naga, Kuki, Zomi**, Hmar insurgent groups.
- The presence of an unfenced border and unregulated migration from Myanmar have been attributed as some of the factors responsible for the ethnic violence in Manipur.
  - This has resulted in **violence, extortion and diverse demands by various Indian Insurgent Groups (IIGs)** which maintain **safe havens/camps in neighbouring countries**.
- The smart fencing system will deter unauthorized entry and infiltration by insurgents and illegal actors, addressing a pressing security issue.

○ **Enhancing Surveillance:**

- A smart fencing system is equipped with advanced **surveillance technologies to monitor and respond** to border breaches in real time.

○ **Tackling Complex Security Challenges:**

- The northeastern region faces a fragile security situation due to factors such as **terrain, socio-economic development, tribal rivalries, and migration**.
  - The smart fencing system is a proactive measure to mitigate these threats and maintain peace and stability in the region.

**What are the Key Points**

**Regarding the India-Myanmar Border?**

- India shares a long land border of over 1643 km with Myanmar as well as a maritime boundary in the Bay of Bengal. Four northeastern states, viz. **Arunachal Pradesh (520 km), Nagaland (215 km), Manipur (398 km) and Mizoram (510 km)**.

- Out of 1,643 km, a **demarcation of 1,472 km has been completed** as per the MHA’s 2022-23 annual report.

- Myanmar is the only **ASEAN** country adjoining India and, therefore, is a gateway to **SouthEast Asia**.

- The border is porous and unfenced in many parts, allowing **free movement of people and goods under a bilateral agreement**. The border also witnesses illegal activities and is also affected by the activities of various insurgent groups that operate in the region and often take shelter in Myanmar.

- A **Free Movement Regime (FMR)** exists between India and Myanmar. **“Under the FMR, every member of the hill tribes, who is either a citizen of India or a citizen of Myanmar and who is resident of any area within 16 km on either side of the Indo-Myanmar border can cross the border on the production of a border pass (one-year validity) issued by the competent authority and can stay up to two weeks per visit.”**

- The Manipur government has suspended the FMR since 2020, **post-Covid-19 pandemic**.

**What are the Other**

**Smart Fencing Projects in India?**

- India’s first ‘**smart fence**’ pilot project was launched along the **India-Pakistan border in 2018**.
- Later the project **BOLD-QIT (Border Electronically Dominated QRT Interception Technique)** was launched under the **Comprehensive Integrated Border Management System (CIBMS)** on the Indo-Bangladesh border in 2019.
- Two pilot projects covering about 71 Kms on Indo-Pakistan Border (10 Kms) and Indo-Bangladesh Border (61 Kms) of **CIBMS** have been completed.
  - CIBMS involves deployment of a range of state-of-the-art surveillance technologies — **thermal imagers, infra-red and laser-based intruder alarms, aerostats for aerial surveillance, unattended ground sensors** that can help detect intrusion bids, **radars, sonar systems** to secure riverine borders, **fiber-optic sensors** and a command and control system that shall receive data from all surveillance devices in real time.

Note:



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### A Gist of Border Infrastructure Development

	Main Threat	What needs to be done?	What has been done?
Pakistan	War, insurgency, smuggling.	C.I.B.M.S. monitoring with a well-trained and larger BOLD-QIT, more than one route connecting far flung areas, especially Jammu and Kashmir	C.I.B.M.S. in some stretches, 3 <sup>rd</sup> route to Leh to be opened by 2023.
China	War	Armored vehicle capable infrastructure, high altitude airfields.	Daulet Beg Oldie airfield running, some bridges and tunnels armored vehicle capable.
Bangladesh	Smuggling, human trafficking	C.I.B.M.S. monitoring with BOLD-QIT throughout including riverine stretches	Brahmaputra river covered, rivulets still remaining.
Nepal	Smuggling, human trafficking	C.I.B.M.S. monitoring with BOLD-QIT	Planning stage.
Bhutan	Smuggling	Armored vehicle capable road connectivity till Bhutan-China border.	B.R.O. working on it.
Myanmar	Smuggling, insurgency, trafficking.	C.I.B.M.S. monitoring with bigger and more efficient BOLD-QIT to tackle insurgency, roads for swift troop movements	Some roads present. C.I.B.M.S. planning stage.

■■■

Note:



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# Art and Culture

## Highlights

- Puri Jagannath Temple's Ratna Bhandar
- Odhuvars in Tamil Nadu

## Puri Jagannath Temple's Ratna Bhandar

### Why in News?

Recently, the demand to open the **Ratna Bhandar** (treasure room) of the **Jagannath Temple** is growing louder again. The treasure room at the temple has not been unlocked for three decades.

### What is Jagannath Temple's Ratna Bhandar?

- **About:**
  - The precious ornaments of sibling deities, **Lord Jagannath, Lord Balabhadra and Goddess Subhadra**, given by devotees and erstwhile kings over centuries, are stored in the Ratna Bhandar of the **12<sup>th</sup> century shrine**.
  - The Ratna Bhandar consists of two chambers: the **Bhitar Bhandar (inner chamber)** and the **Bahara Bhandar (outer chamber)**.
    - While the outer chamber is opened regularly to fetch ornaments for the deities during important rituals and festivals, the inner chamber has not been opened in the past **38 years**.
- **Demands for Opening the Ratna Bhandar:**
  - The demand to open the Ratna Bhandar has gained momentum due to concerns over the **chamber's structural integrity**.
    - The **Archaeological Survey of India (ASI)**, the custodian of the temple, requisitioned the chamber for repair and conservation due to apprehensions of cracks in its walls, which could endanger the priceless ornaments stored within.

### Jagannath Temple

- The **Jagannath temple** located in **Puri, Odisha** is a sacred temple devoted to **Lord Jagannath** along with his brother **Lord Balabhadra** and sister **Devi Subhadra**.
  - It was constructed by a famous king of Ganga Dynasty **Ananta Varman Chodaganga Deva** dating back to **12<sup>th</sup> century**.
  - It is known as the "**White Pagoda**" and one of the **four pilgrimage sites of Char Dham Pilgrimage**.
- It is an outstanding example of **Kalinga architecture**, featuring distinctive curvilinear towers, intricate carvings, and ornate sculptures.
  - It is enclosed by a **high wall with four gates**, each facing a cardinal direction.
- It is also called as '**Yamanika Tirtha**' where, according to the Hindu beliefs, the **power of 'Yama', the god of death**, has been nullified in Puri due to the presence of Lord Jagannath.
- **Associated Major Festivals:** Snana Yatra, Netrotsava, Rath Yatra, Sayan Ekadasi.



Note:

## Odhuvvars in Tamil Nadu

### Why in News?

Recently, Tamil Nadu government handed over appointment orders to **15 Odhuvvars** (among them five are women), who were assigned to **Shaivite temples** in the Chennai region as they **serve the deities by singing the hymns and praise**.

### Who are Odhuvvars in Tamil Nadu?

#### ➤ About:

- Odhuvvars sing devotional hymns in Tamil Nadu's Hindu temples but are **not priests**. They are in the service of Lord Shiva by singing his **praise from Thirumurai in Saivite temples**. They sing devotional hymns **but do not enter the sanctum sanctorum**.

#### ➤ Origin of Odhuvvars:

- The tradition of Odhuvvars can be traced back to ancient times, **with its roots firmly embedded in the Bhakti movement**, which flourished **between the 6th and 9th centuries in Tamil Nadu**.
- During this period, **several saint-poets known as Alvars and Nayanars** composed devotional hymns in **praise of Lord Vishnu and Lord Shiva, respectively**. The Odhuvvars emerged as **custodians of this rich musical and devotional heritage**.

#### Alvars and Nayanars:

##### The Saints of Tamil Bhakti Tradition

#### ➤ Alvars:

- **Devotion to Lord Vishnu:** The Alvars were a group of **twelve Vaishnava (devotees of Lord Vishnu) saint-poets**. Their compositions primarily centered on their deep devotion to Lord Vishnu and emphasized the **concept of surrender (prapatti) to attain salvation**.
- **Poetic Works:** The Alvars' devotional hymns and poems were collected in the **Naalayira Divya Prabandham**, a significant Vaishnavite scripture. These hymns were composed in the Tamil language and celebrated the divine qualities and forms of Lord Vishnu.

#### ➤ Nayanars:

- **Devotion to Lord Shiva:** The Nayanars were a group of **sixty-three Shaiva (devotees of Lord Shiva) saint-poets**. They were deeply devoted

to Lord Shiva and composed hymns and poems in praise of him, emphasizing the path of **bhakti (devotion) and love for the divine**.

- **Poetic Works:** The Nayanars' hymns and poems were collected in the **Thirumurai, a corpus of Shaivite scriptures**. These compositions, written in Tamil, celebrated the various manifestations and attributes of Lord Shiva.

### What is the Significance of Odhuvvars in Present Context?

- **Religious Significance:** Odhuvvars continue to hold a crucial place in the daily and festive rituals of Tamil Nadu temples. **They are responsible for reciting Thevaram and Thiruvasagam**, two ancient Tamil texts filled with hymns and praises for Lord Shiva.
- **Community Engagement:** Odhuvvars often come from **marginalized communities, and their role in temples offers economic opportunities**. Moreover, their performances bring the local community together, **fostering a sense of unity and belonging**.
- **Preservation of Tamil Language:** Odhuvvars contribute to the preservation of the Tamil language. Through their recitations, they ensure that the ancient Tamil texts are **understood and appreciated by successive generations**.
- **Promotion of Devotion:** Odhuvvars help create a devotional atmosphere within the temples. Their soul-stirring renditions instill a **sense of piety and spiritual connection among the worshippers**.

### What are the Challenges and Issues of Odhuvvars in Tamil Nadu?

- **Economic Vulnerability:**
  - Many Odhuvvar families struggle to make ends meet, as their **income depends largely on temple donations and offerings**. This economic vulnerability can lead to the decline of the tradition.
- **Lack of Recognition:**
  - The Odhuvvars' contribution to temple rituals and preservation of Tamil culture often goes unnoticed. **They receive limited recognition**, which can be demotivating.

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➤ **Declining Interest:**

- The younger generation may not be as interested in continuing the tradition, as it can be financially unstable and offers limited social prestige. **This raises concerns about the continuity of the tradition.**

➤ **Technology and Modernization:**

- The advent of recorded music and modernization has altered the way people consume religious

and devotional content. **Odhuvars may find it challenging to compete with digital media** and contemporary musical forms.

➤ **Lack of Institutional Support:**

- Recognised government institutions like **Sangeet Natak Academy** etc have been **non-committal to Odhuvar's concerns** as their expertise and competence in the field can alleviate the suffering of the community.



Note:

# Geography

## Highlights

- International Migration Outlook 2023

- Fragility of Indian Himalayan Region

## International Migration Outlook 2023

### Why in News?

Recently, **International Migration Outlook 2023**, a report on international migration patterns was released by the **Organisation for Economic Co-operation and Development (OECD)** to analyze the migration trends worldwide.

### What are the Highlights of the Report?

- **India Leads in Migration to OECD Countries:**
  - In 2021 and 2022, India became the primary source of migration to OECD countries, surpassing China. India consistently topped the list **with 0.41 million new migrants in both years**, while China had **0.23 million new migrants**, followed by Romania with approximately 200,000 new migrants.
- **Climate-Induced Displacement and Policy Responses:**
  - The report sheds light on the **increasing focus on policy responses to climate-induced displacement in recent years**. Few OECD countries have explicit policies to address this issue.
  - Notably, **Colombia began discussing a pioneering bill in April 2023**, aiming to recognize and support climate-displaced individuals, with a broad definition and provisions for housing, healthcare, education, and a national register.
- **Record Refugee Inflows and Worker Migration:**
  - The **OECD region experienced record refugee inflows due to the Russia-Ukraine war**, with over 10 million people becoming internally displaced or refugees. Worker migration saw significant increases from India, Uzbekistan, and Turkey, making them prominent source countries following Ukraine.

### ➤ Recent Trends in International Migration:

- All top four destination countries (**The United States, Germany, the United Kingdom and Spain**) registered large year-on-year increases, between 21% and 35%. The increase was smaller in Canada (8%) the fifth destination country.
- The United States **alone accounted for 1.05 million new permanent-type migrants**, and the other four countries for between 440 000 and 650 000 each.

### ➤ Permanent-Type Migration by Main Categories:

- In 2022, **family migration** remained the primary category of entry for new permanent-type migrants, **representing 40%** of all permanent-type migration, a relatively stable share over time.
- The share of **labour migration** has increased over time. While in 2022, **labour migration represented 21% of permanent-type migration**, it accounted for **only 16% in 2019**.
- Conversely, the share of **free movement migration** (within the **EU-EFTA** and between Australia and New Zealand) has decreased since 2020. It accounted for **21% of permanent-type migration in 2022**, compared with **28% in 2019**.

### What is OECD?

#### ➤ About:

- The OECD is an **intergovernmental economic organisation**, founded to stimulate economic progress and world trade.
- Most OECD members are high-income economies with a very high **Human Development Index (HDI)** and are regarded as developed countries.

#### ➤ Foundation:

- It was founded in 1961 with its **Headquarters at Paris, France and total membership is 38 countries**.
- The most recent countries to join the OECD were Colombia, in April 2020, and Costa Rica, in May 2021.

Note:



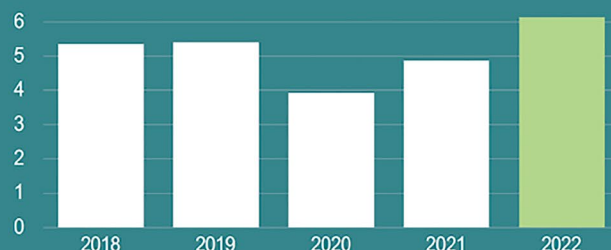
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- India is not a member, but a key economic partner.
- Reports and Indices by OECD:
  - Government at a Glance
  - OECD Better Life Index.

### Migration to OECD countries is at a record high

Permanent migration to the OECD, 2018-22, in millions



With more than 6 million new permanent immigrants (not including Ukrainian refugees), permanent-type migration to OECD countries reached a record level in 2022.

### The Ukrainian refugee crisis is the largest displacement in Europe since WWII

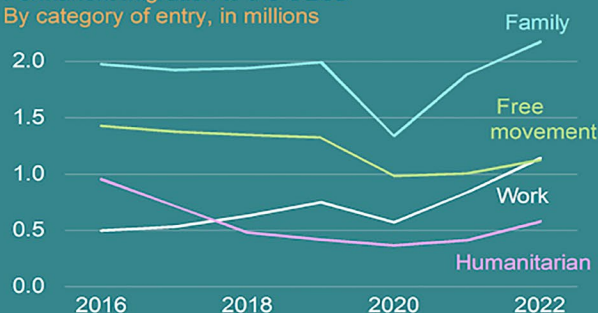
Total number of refugees from Ukraine, June 2023, millions



OECD countries have provided refuge to about 5 million people fleeing Ukraine.

### Increase in labour migration in response to labour shortages in many countries

Permanent migration to the OECD  
By category of entry, in millions



Labour migration comprised 21% of all migration in 2022, a rise of 36% since 2021. Family migration also increased by 15%.

### Migrant employment rates are at the highest levels in over two decades

Migrant employment rates are at their highest ever levels in more than half of OECD countries and the gap with the native-born is also narrowing.

Employment rates, 2022

	Foreign-born	Native-born
New Zealand	82.7	78.3
Australia	77.2	77.6
UK	75.8	75.5
Canada	75.2	75.8
US	72.6	69.4
Korea	67.8	69.3
EU 27	66.8	70.3

### Migrant fertility has little effect on overall population levels in majority of countries

Total Fertility Rate (TFR), 2020 or latest year available



The fertility rate among migrant women is higher than among native-born women in most OECD countries, but below the replacement rate (2.1) in two-thirds of them.

### Immigrant mothers face greater challenges compared to native-born mothers

Employment rates across OECD countries, 2021



Immigrant mothers



Native-born mothers

Across OECD countries, the gap in employment rates between immigrant and native-born mothers is 20 percentage points.

Note:

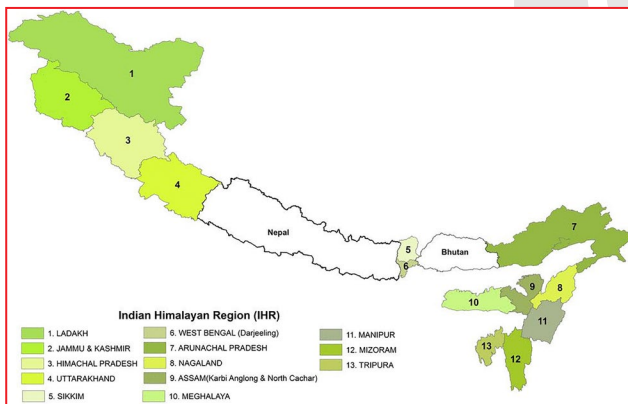
# Fragility of Indian Himalayan Region

## Why in News?

The **Teesta dam** breach in Sikkim led to **floods** and also the recent **landslides** in Himachal Pradesh are stark reminders of the toll our development model is taking on the environment and ecology, especially in the mountainous **Indian Himalayan Region**.

### The Indian Himalayan Region (IHR):

- It refers to the **mountainous area in India** that encompasses the entire Himalayan range within the country. It stretches from the **northwestern part of India in Jammu and Kashmir to the northeastern states along the border with countries like Bhutan, Nepal, and Tibet (China)**.
- It **covers 11 states** (Himachal Pradesh, Uttarakhand, Sikkim, all northeast states, and West Bengal) **and 2 UTs** (Jammu & Kashmir and Ladakh).



## What are the Issues in the Indian Himalayan Region (IHR)?

- **Flaws in Graded Approach:**
  - Specified flaws in the graded approach of the Indian regulatory system, such as Ministries and Departments emphasise that the **IHR is not given special consideration, despite its ecological significance**.
  - The Himalayas are **prone to extreme weather conditions, seismic activity, and the effects of climate change**, yet there are no differentiated environmental standards for projects in this region.

- **Issues in Implementation of Different EIA Stages:**
  - There is a profound lack in addressing the IHR's needs at all stages of the **Environment Impact Assessment (EIA)** process, **from screening to appraisal**, by aligning project requirements with the region's ecological needs.
  - The inclusion of clauses in the **EIA notification to account for specific characteristics of projects in mountainous areas** so as to elevate their liability is also lacking.
- **Lack of National Level Regulator:**
  - One significant issue in the EIA process is the **absence of a national-level regulator, which was suggested by the Supreme Court in 2011 in Lafarge Umiam Mining (P) Ltd. and T.N. Godavarman Thirumulpad vs Union of India, 1995**
  - Currently, EIA processes tend to favor project proponents, and there is a lack of comprehensive consideration of cumulative impacts, especially in mountainous areas like the IHR.
- **Issue of Uniformity in EIA 2006 Notification:**
  - The EIA 2006 notification **categorizes projects based on sectors like mining, power generation, and infrastructure**, but the threshold limits for requiring an EIA remain the same across the country.
  - This **uniform approach fails to consider the unique needs and vulnerabilities of the Indian Himalayan Region (IHR)**, despite its ecological importance and fragility.
- **Issues in Draft EIA 2020 Notification:**
  - The EIA process has evolved with several amendments over the years, with a **draft EIA in 2020 raising concerns about being perceived as pro-industry and neglecting ecological considerations**. The EIA, when used diligently, can be a potent tool for environmental governance and sustainable development.

## What are the Steps Required to Safeguard the Ecological Fragility of IHR?

- **Differentiated Environmental Standards:**
  - Differentiated environmental standards should be established, taking into account the region's fragility and vulnerability.
    - These standards should be **incorporated into the Environment Impact Assessment (EIA) process, ensuring that projects in the IHR are subject to more stringent regulations and scrutiny**.

Note:



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- **Strategic Environmental Assessment (SEA):**
  - Policymakers should consider implementing SEA, which assesses the cumulative impact of development in an area.
  - **Integrating SEA into the clearance process can provide a comprehensive view of the potential consequences** of development activities.
- **Local Community Involvement:**
  - These communities often **have a deep understanding of the region's ecology and can provide valuable insights** into the potential impacts of development.
  - Ensuring their participation can lead to more ecologically sound and socially responsible projects.
- **Ecosystem-Based Approaches:**
  - Implement ecosystem-based approaches to development. Recognize that the IHR is not just a source of resources but also plays a critical role in maintaining regional and national ecological balance.
  - **Policies should prioritize the protection and restoration of ecosystems, including forests, rivers, and biodiversity.**
- **Rethinking Infrastructure Development:**
  - Infrastructure projects in the IHR should be planned carefully. **Projects like dams, roads, and hydropower plants should undergo rigorous assessments to minimize their impact on the environment.**
  - Consider alternative technologies and routes that are less disruptive.
- **Cross-Border Cooperation:**
  - The Himalayan region **extends across several countries**, and ecological challenges are not confined by political boundaries. **India should engage in regional cooperation to address shared environmental issues.**
  - Collaborative efforts can help in mitigating transboundary challenges such as air and water pollution.
- **Public Awareness and Education:**
  - Raise public awareness about the ecological significance of the IHR.
  - **Education and advocacy** can lead to more responsible behavior and choices among individuals, corporations, and policymakers.

- **Nature-Based Tourism:**
  - Develop **sustainable and responsible tourism practices** that generate income for local communities while minimizing negative impacts on the environment.
  - This could involve promoting **eco-tourism**, enforcing carrying capacity limits, and raising awareness among tourists.

### ***What is Draft Environment Impact Assessment (EIA) Notification 2020?***

- **About:**
  - The **Draft EIA Notification 2020**, when it was introduced, aimed to replace the previous **EIA Notification of 2006**.
- **Post-facto Clearance:**
  - The draft notification **introduced the concept of post-facto clearance**, which would allow certain projects to seek **environmental clearance** even after they had begun operations without clearance.
- **Reduced Public Participation:**
  - Critics argued that the draft notification **weakened the public consultation process**, making it more challenging for concerned citizens and communities to voice their opinions and objections regarding proposed projects.
- **Exemptions for Certain Projects:**
  - The draft notification **proposed exemptions for certain categories of projects, allowing them to bypass the EIA process.**
- **Extension of Project Validity:**
  - It **suggested extending the validity period of environmental clearances** for various projects, potentially reducing the need for frequent re-evaluations of environmental impacts.
- **Dilution of Compliance Reports:**
  - There were concerns about the dilution of compliance reports, which are meant to ensure that projects adhere to environmental conditions and standards.
  - The draft notification generated dubious standards, **with environmental activists, experts, and concerned citizens voicing their objections.**

Note:

**EIA in India****➤ About:**

- The Indian experience with **Environmental Impact Assessment** began over 20 years back. It started in 1976-77 when the **Planning Commission** asked the Department of Science and Technology to examine the river-valley projects from an environmental angle.

**➤ EIA 1994 Notification:**

- In 1994, the then Union Ministry of Environment and Forests, **under the Environmental (Protection) Act 1986**, promulgated an **EIA notification making Environmental Clearance (EC) mandatory for expansion or modernisation** of any activity or for setting up new projects listed in **Schedule 1** of the notification.

**➤ EIA 2006 Notification:**

- The Ministry of Environment, Forests and Climate Change (MoEFCC) notified new **EIA legislation in September 2006**.
- The notification **makes it mandatory for various projects such as mining, thermal power plants, river valley, infrastructure** (road, highway, ports, harbors and airports) and industries including very small electroplating or foundry units to get environment clearance.
- However, **unlike the EIA Notification of 1994, the new legislation has put the onus of clearing projects on the state government** depending on the size/capacity of the project.



Note:



# Ethics

## Highlights

- *Ethical Aspects of Data Manipulation in Research*

## Ethical Aspects of Data Manipulation in Research

### Why in News?

Recently, allegations of fraud in the behavioral sciences emerged as independent investigators exposed data manipulation involving Francesca Gino, a Harvard Business School professor **found guilty of research misconduct for studies on honesty and unethical behavior.**

- One such example is the case of **Annamalai University in Tamil Nadu**, where at least 200 academic papers published by researchers contain plagiarized text, manipulated images, and fudged data in which the university's vice-chancellor was also an author.

### Why do Researchers Commit Misconduct?

- **Root Causes of Research Misconduct:**
  - Researchers have strong motivations to produce groundbreaking findings and results supporting alternative hypotheses, largely due to incentives. **However, these substantial incentives have, in some cases, led to shoddy and even fabricated work.**
    - Scientific misconduct has a long history, from the **infamous Piltdown Man hoax in 1912** (a fraudulent attempt to fill in the missing link between primate and man) **to more recent cases like Diederik Stapel.** It persists in various forms in different fields, even today.
- **Motivators and Contributing Factors to Misconduct:**
  - The **low risk of detection by reviewers** and the mentoring styles of research supervisors can play a role in misconduct. The **lack of comprehensive policies at the national and institutional levels** to penalize misconduct are also cited as contributors to the problem.

### ➤ Systematic Causes of Misconduct:

- **Funding and Pressure Relief:**
  - One approach is to ensure adequate funding and reduce the pressure on researchers. This could involve **allocating a portion of research grants for quality-control activities**, allowing investigators to conduct more comprehensive and efficient investigations.
- **Support for Replication Studies:**
  - Supporting replication studies, which verify the results of other studies, is another valuable method. **Financial aid for replication studies, in the form of cash rewards**, can incentivize researchers to conduct such studies.

### What are the Ethical Effects of Misconduct?

- **Long term Consequences:**
  - Scientific misconduct, regardless of its scale, can have far-reaching consequences, especially **when influential figures in a field are involved.**
    - For instance, leaders in a scientific field, such as Dr. Gino, whose work serves as the foundation for others, **can potentially damage years of research when their misconduct comes to light.**
- **The Widespread Implications of Misconduct:**
  - It's not limited to a single case; instead, **it can cast a shadow over numerous papers and findings** that relied on the compromised work, **endangering the integrity of years of scientific inquiry.**
- **Lack of Transparency in Scientific Publishing:**
  - Scientific publishing, beyond its role in research and academia, plays a significant role in perpetuating research misconduct, often without adequate investigation or correction of signs of misconduct in published papers.
    - Recent events, **like Nature retracting a paper due to data discrepancies**, highlight the **lack of transparency** in the publication process.

Note:

### ***How Should Misconduct be Dealt With?***

#### ➤ **Addressing Scientific Misconduct with the OSF:**

- One innovative approach to tackling scientific misconduct is the **Open Science Framework (OSF)**. This framework aims to uphold scientific integrity by advocating for practices like pre-registration, which involves establishing a study's hypotheses, methods, and analyses before conducting it.
  - The OSF is a free, open platform to support research and enable collaboration established by the **Center for Open Science (COS)**, a **non-profit organization**.

#### ➤ **Ambitious 'SCORE' Project:**

- Furthermore, the OSF team has launched the **'Systematizing Confidence in Open Research and Evidence' (SCORE) project**, which aspires to enhance research credibility through automated tools that generate rapid and accurate confidence scores for research claims.

#### ➤ **Involve More Stakeholders:**

- Dealing with fraud in the scientific community involves various methods. However, these methods can be inconsistent across institutions. This results in researchers who are willing to cooperate still facing unofficial forms of punishment, which **should be addressed by involving different stakeholders**.



Note:



# Miscellaneous

## Highlights

- India's Ambitious Bid to Host the 2036 Olympic Games

# ASIAN GAMES



### ABOUT

- Biggest sports competition in Asia, held once every four years.
- Regulated By Olympic Council of Asia

### BACKGROUND

- The first-ever Asian Games were held in New Delhi in 1951
- The 9<sup>th</sup> Asian Games were also held in New Delhi in 1982

### CURRENT EDITION

- The **19<sup>th</sup> Asian Games, 2022** (delayed by a year due to Covid-19)
  - » **Location:** Hangzhou, the People's Republic of China,
  - » **Mascot:** Congcong, Lianlian and Chenchen (Three sporty robots)
  - » **Participants:** 45 Nations, 40 sports
  - » **Introduction of New Sports:** e-Sports and Breakdancing.
- » **Upcoming Edition:** Japan (2027), Qatar (2030), Saudi Arabia (2034)

### INDIA'S RECORDS IN 19<sup>TH</sup> ASIAN GAMES 2023

#### LARGEST REPRESENTATION:

- 655 athletes in 41 different disciplines

#### RECORD-BREAKING PERFORMANCE:

- A total of **107 medals** - **28 gold**, **38 silver**, and **41 bronze**.
- First time India crossed the **100-medal mark**
- Secured **4<sup>th</sup> position** in overall ranking

#### TOP PERFORMING SPORT:

- Athletics (29 Medals) > Shooting (22 Medals) > Archery (9 Medals)

#### MAJOR MILESTONES :

- » **Neeraj Chopra's** successful **title defense** in the **Javelin** throw.
- » The **Archery** compound team won **all five gold medals** in their category.
- » **Cricket** and **Kabaddi** teams each earned two gold medals.
- » The men's hockey team's gold medal secured a spot for India at the Paris **2024 Olympics**.
- » **First-ever** Asian Games gold medal in **Badminton**.



## MEDAL STANDINGS

The 19th Asian Games Hangzhou



Rank	Team/NOC				Total
1.	People's Republic of China	201	111	71	383
2.	Japan	52	67	69	188
3.	Republic of Korea	42	59	89	190
4.	India	28	38	41	107
5.	Uzbekistan	22	18	31	71



Note:

## India's Ambitious Bid to Host the 2036 Olympic Games

### Why in News?

Recently, the Indian Prime Minister announced India's intention to host the **Olympic Games**, ideally in 2036 during the opening ceremony of the **141st International Olympic Committee session** in Mumbai.

- China, South Korea, and Japan are the only Asian countries to have hosted the Olympics, with Japan having hosted the games in both 1964 and 2020.

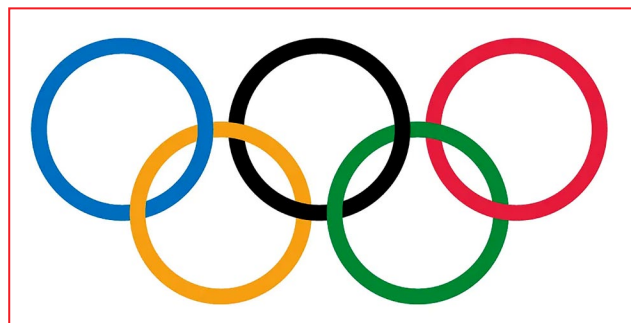
### What is the Procedure of Selecting a Host City for Olympics?

- **Traditional System:**
  - Cities submit a letter of interest to the **International Olympic Committee (IOC)**. It involved a lengthy multi-year, multi-step evaluation process.
  - Hosts were selected **seven years in advance**.
  - Often led to excessive **spending, debt, corruption, and scandals**.
- **New Approach: Olympic Agenda 2020:**
  - In 2013, **Thomas Bach** became the **IOC president** and introduced the **Olympic Agenda 2020**, a blueprint for the Olympic Movement's future.
  - In 2014, the agenda was approved during the IOC session. A key aspect was the '**new norm**' for selecting **host cities**, which was **officially adopted in 2019** during the IOC session in **Lausanne, Switzerland**.
    - It **replaced the seven-year rule** for selecting hosts with greater flexibility.
    - Emphasized **flexibility, sustainability, and cost-effectiveness** with the motto "**The Games adapt to the region, the region does not adapt to the Games.**"
    - It consists of two stages: **continuous dialogue and targeted dialogue**.
      - Continuous dialogue allows flexible master plans without specific deadlines.
      - Targeted dialogue lasts up to 12 months, involving detailed discussions, guarantees, and an advisory report.

**Note:** All editions of the **Olympic Games from 2030 onwards** must also adhere to the **IOC's climate positive commitment, reducing bid budgets**.

### What are the Significant Aspects Associated with the Olympics?

- **About:**
  - The **Olympics** are an international sporting event that takes place **every four years**.
    - The goals of the Olympics are to **cultivate human beings through sport and contribute to world peace**
  - The Olympics include: **Summer Games, Winter Games, Youth Olympics Games**.
- **History and Origin:**
  - Olympics trace their roots back around **3,000 years to Ancient Greece's Peloponnese region**.
  - While the precise starting date remains uncertain, **776 BC** is a commonly mentioned year in historical records.
    - The first modern Olympics were held in **Athens, Greece in 1896** based on the **plan of Pierre de Coubertin**.
- **Olympic Rings:**
  - The Olympic symbol consists of **five interlocking rings of different colors (blue, yellow, black, green, and red)** on a white background.
    - These rings represent the **five continents of the world** and symbolize the **unity and diversity of nations through sports**.



- **Upcoming Events:**
  - **Summer Olympics 2024:** Paris, France
  - **Winter Olympics 2026:** Milan-Cortina d'Ampezzo, Italy
  - **Summer Olympics 2028:** Los Angeles, USA
  - **Summer Olympics 2032:** Brisbane, Australia

### What are the International Multi Sporting Events Hosted by India?

- **Asian Games:** 1951 and 1982
- **Commonwealth Games:** 2010
- **South Asian Games:** 1987, 1995, 2016.



# Rapid Fire Current Affairs

## Highlights

- Vigilance Week 2023
- *Candolleomyces Albosquamosus*: A New Species of Mushroom
- Cyclone Hamoon
- Causes of the 2023 Turkey-Syria Earthquakes
- PFRDA's Mandatory Penny-Drop Verification for NPS
- India Mobile Congress (IMC 7th Edition) 2023 and 100 5G labs Initiative
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- World Spine Day 2023
- World White Cane Day
- World Student's Day, 2023
- Coastal Security Exercise-East Coast Sagar Kavach 2023
- World Food Day, 2023
- Five New Sports in Olympic Games

## Vigilance Week 2023

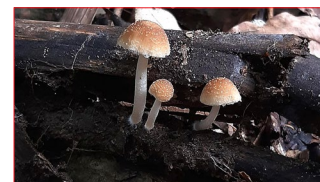
The **Central Vigilance Commission (CVC)** is observing the **Vigilance Awareness Week 2023** from **30th October to 5th November, 2023**, centered around the theme **"Say no to corruption; commit to the Nation."**

- This comprehensive initiative demonstrates a concerted effort towards promoting vigilance and combating corruption within government departments and organizations.
- CVC is an **apex governmental body in India** that is responsible for promoting integrity, transparency, and accountability in the country's public administration.
  - It was established in **1964** based on recommendations of the **Santhanam Committee on Prevention of Corruption**.

Read more: **Central Vigilance Commission**

## Candolleomyces Albosquamosus: A New Species of Mushroom

Recently, the **Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI)** revealed a newly identified species of **mushroom**, *Candolleomyces albosquamosus*, found on their campus within the Western Ghats in Kerala.



Note:

- This delicate mushroom showcases a charming **honey-yellow 'cap'** with distinctive **white woolly scale-like structures**.
- It **thrives on dead logs and bamboo culms** within the natural forest habitat.

## Cyclone Hamoon

**Cyclone** Hamoon, a very severe **Bay of Bengal cyclone**, which made landfall as a cyclonic storm near midnight on October 24-25, 2023 south of Chattogram, Bangladesh, exhibited highly unusual behavior, changing categories four times within 24 hours before landfall.

- The shifts ranged from a **cyclonic storm** to a **severe cyclonic storm** to **very severe** and eventually to a **cyclonic storm**.
- The weakening of **cyclone Tej in the Arabian Sea** may have contributed to Hamoon's strengthening in the Bay of Bengal, as twin cyclonic systems often **exhibit one growing stronger**.

# CYCLONE

Cyclones are rapid **inward** air circulation around a **low-pressure** area.

**Cyclone v/s Anticyclone**

Pressure System	Pressure Condition at the Center	Pattern of Wind Direction	
		Northern Hemisphere	Southern Hemisphere
Cyclone	Low	Anticlockwise	Clockwise
Anticyclone	High	Clockwise	Anticlockwise

**Classification**

- Tropical Cyclones; originate between the Tropics of Capricorn and Cancer
- Extra Tropical/ Temperate Cyclones; originate in the Polar Regions

**Conditions for Formation**

- Large sea surface with temperature >27° C.
- Presence of the Coriolis force
- Small variations in the vertical wind speed
- A pre-existing weak low-pressure area
- Upper divergence above the sea level system

**Different Names for Tropical Cyclones**

- Typhoons - Southeast Asia and China
- Hurricanes - North Atlantic and eastern Pacific
- Tornadoes - West Africa and southern USA
- Willy-willies - Northwest Australia
- Tropical Cyclones - Southwest Pacific and Indian Ocean

**Nomenclature**

- Nodal Authority - World Meteorological Organization (WMO)
- Indian Ocean Region - Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand contribute to naming cyclones that occur in this region.

**Cyclones in India**

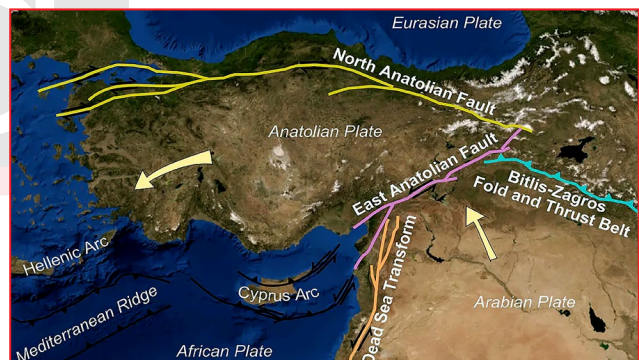
- Bi-annual Cyclone Season - March to May and October to December
- Recent Cyclones - Tauktae, Vayu, Nisarga and Mekanu (in Arabian Sea) and Asani, Amphan, Fani, Nivar, Bulbul, Titli, Yaas and Sitrang (in Bay of Bengal)

Read more: [India's Cyclone Preparedness](#)

## Causes of the 2023 Turkey-Syria Earthquakes

A recent study published in the journal **Science** sheds light on the catastrophic **earthquakes** that struck **Turkey and Syria in February 2023**. These earthquakes, with unprecedented scale and destruction, have prompted a closer look at the intricate interplay of **tectonic forces**.

- Earth's crust is divided into **tectonic plates**, where **fault lines** form due to interactions such as **collisions, separations, or sliding**.
  - The **East and North Anatolian Fault Lines**, stretching over 700 km and 1,500 km, played a significant role in the Turkey earthquakes.
- During the earthquakes, the conversation between the fault lines was interrupted by a seismic cascade (chain reaction of **ruptures or movements in the Earth's crust** that occurred during the earthquakes). Leading to a much bigger rupture than anticipated and causing extensive damage.



Read more: [Earthquakes in Turkey and Causes](#)

## PFRDA's Mandatory Penny-Drop Verification for NPS

The **Pension Fund Regulatory and Development Authority (PFRDA)** has introduced mandatory 'penny drop' verification for **National Pension System (NPS)** subscribers, ensuring timely fund transfers during withdrawals.

- The penny drop verification process involves **Central Recordkeeping Agencies (CRA)** verifying the **active status of the savings bank account** and cross-referencing the name in the account with the subscriber's **Permanent Retirement Account Number (PRAN)** or submitted documents.

Read more: [National Pension System](#)

Note:



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## India Mobile Congress (IMC 7th Edition) 2023 and 100 5G labs Initiative

- The **Prime Minister of India** inaugurated the **7th Edition of the India Mobile Congress 2023** in New Delhi.
  - **India Mobile Congress (IMC)** is the **largest telecom, media, and technology forum** in **Asia** to be held from **27th to 29th October 2023**.
  - Theme of IMC: **'Global Digital Innovation'**.
  - The **IMC 2023** aims to strengthen India's position as a **developer, manufacturer, and exporter** of key **cutting-edge technologies**.
  - PM awarded **100 '5G Use Case Labs'** to **educational institutions** across the country.
  - The **'100 5G labs initiative'**, is an endeavor to realize the opportunities associated with **5G technology** by encouraging the development of **5G applications**.
  - The rollout of **5G** has been completed, with plans to extend coverage nationwide by **March 2024**.

Read More: **India Mobile Congress 2023**

## World Polio Day

- **World Polio Day** is celebrated every year on **October 24** to create **awareness** around the **importance of polio vaccination** to protect children.
  - **Polio** is a very **infectious illness** that has been around since ancient times, is a **life threatening and disabling disease** that can spread from **person to person** and can cause **paralysis** or may cause **weakness in arms or legs**.
  - Polio virus can live in an infected a person's **throat** and **intestines** and can be contracted by **food** and **water** in **unhygienic conditions**.
  - It can spread through a **sneeze or feces** of an infected person.
  - **Oral polio vaccine (OPV)**:
    - It produces **antibodies** in the **blood** to protect the individual against **polio paralysis** by preventing the spread of **poliovirus** to the **nervous system**.
  - **Inactivated polio vaccine (IPV)**:
    - It is an injectable three dose vaccine and can be either administered alone or along with other

vaccines (e.g., diphtheria, tetanus, pertussis, hepatitis B, and haemophilus influenzae).

Read More: **World Polio Day**

## EU and India Carry Out Maiden Joint Naval Exercise

India and the **European Union (EU)** collaborated in the Gulf of Guinea to enhance naval maritime security cooperation in the region. This marked their first joint naval exercise, following the **EU-India Maritime Security Dialogue**.

- During the exercise, the Indian Navy's **INS Sumedha**, along with ships from Italy, France, and Spain, conducted tactical maneuvers **off the coast of Ghana**, including boarding and flying exercises.
- These efforts demonstrated India and the EU's joint commitment to enhancing maritime security in the **Gulf of Guinea**, supporting coastal States, and upholding the **United Nations Convention on the Law of the Sea (UNCLOS)**.



Read More: **Malabar Exercise, Indian Navy - European Union Naval Force (IN-EUNAVFOR) Exercise**

## 37<sup>th</sup> National Games in Goa

The **37<sup>th</sup> National Games** were officially inaugurated by the Prime Minister of India at the Pandit Jawaharlal Nehru Stadium in Margao, Goa

Note:



- A roadmap was outlined that focuses on talent discovery, nurturing, and ultimately, achieving podium finishes at the Olympics. This includes initiatives like **Khelo India** and **Temperament for an Olympics Podium Finish (TOPS)**, which provide scholarships and world-class training to athletes.
  - The **"MY Bharat"** platform was also introduced which aimed at **connecting the youth with national schemes and opportunities**, promoting their potential and contributions to nation-building.
  - India's aspiration to host the **Youth Olympics in 2030 and the Olympics in 2036** were articulated, backed by the nation's growing economy and infrastructure.
- Read More: **Tokyo Olympics 2020, Winter Olympics**

## Unpredictable Nature: Chaos Theory and the Butterfly Effect

- In the domain of natural systems, like the **Earth's atmosphere**, unpredictability and **chaos theory** dominate.
- **Chaos theory is a branch of mathematics** that deals with complex systems that are quite sensitive to their starting conditions.
    - This means that even **small changes at the beginning can lead to big** and unexpected results later on.
  - In the realm of **weather forecasting**, the Earth's atmosphere is constantly changing, with shifting pressure, density, and gas flow rates, making **long-term predictions challenging due to the butterfly effect** and this is where the **famous "butterfly effect" comes in**.
    - Coined by **Edward Lorenz**, **Butterfly effect** illustrates chaos theory. It signifies that the slight motion of a butterfly's wings could trigger tiny atmospheric changes capable of affecting the **course, timing, speed, or even the prevention of a tornado**.
    - This highlights **how small events can significantly impact complex systems**.

Red more: **Weather Forecasting**

## UDAN - Six Years of Transformative Aviation Connectivity in India

The **Regional Connectivity Scheme (RCS) - UDAN (Ude Desh Ka Aam Nagrik)** has marked a **six-year journey**, significantly impacting India's aviation landscape.

- Launched as part of the **National Civil Aviation Policy in 2016**, UDAN has been instrumental in **enhancing infrastructure and connectivity**, particularly in underserved and remote regions. Phases:
    - **UDAN 1.0**: 5 airlines, 128 routes, 70 airports (including 36 new ones)
    - **UDAN 2.0**: **73 underserved airports**, helipads introduced
    - **UDAN 3.0**: Added **tourism routes, seaplanes, North-East routes**
    - **UDAN 4.0**: Boosted **North-East, hilly areas**, included helicopters and seaplanes
  - Following the four successful rounds of bidding, the Ministry of Civil Aviation launched the **5th version of RCS-UDAN** that **emphasizes more flexibility**.
- Read more: **UDAN 5.0 Scheme**

## Indian Army Gets Vertical Wind Tunnel

Indian Army's **Special Forces Training School (SFTS)** in Himachal Pradesh has acquired the Army's first **Vertical Wind Tunnel (VWT)**, enhancing the training infrastructure for special forces and combat free-fallers.

- The VWT is designed to improve the **Combat Free Fall (CFF) skills** of armed forces personnel, creating a controlled environment to simulate real-life freefall conditions. The VWT functions by **generating specific air velocities**, replicating different CFF conditions.
- It assists both beginners and seasoned free-fallers and CFF instructors **by simulating a wide range of freefall scenarios, thereby aiding in assessing individual reactions** in an airborne operating environment.

Read More: **Defense Research and Development Organisation, Indian Navy**

## RISUG: Reversible Male Contraceptive

The **Indian Council of Medical Research (ICMR)** has concluded a seven-year study on the male contraceptive **Reversible Inhibition of Sperm Under Guidance (RISUG)**, finding it to be **safe and effective**.

- RISUG is a **non-hormonal injectable contraceptive** that provides **long-lasting sterility** with complete reversibility.

Note:



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- RISUG works by injecting a polymer gel made of **styrene maleic anhydride (SMA)**. It can be reversed by **injecting a solvent called dimethyl sulfoxide (DMSO)** into the vas deferens, which dissolves the polymer gel and flushes it out of the body.

## Indian Economy to Surpass Japan by 2030: S&P Global

According to S&P Global Market Intelligence, the Indian economy is set to surpass **Japan and Germany by 2030**, **GDP (Gross Domestic Product)** increasing from **USD 3.5 trillion in 2022 to USD 7.3 trillion by 2030**.

- At present, India is ranked 5<sup>th</sup> in terms of the size of its economy at **USD 3.7 trillion in 2023-24**.
- This rapid growth is expected to make India the **Second-Largest economy** in the **Asia-Pacific region**, surpassing Japan.
- India is poised to grow in such a manner due to its **favorable long-term growth prospects**, driven by its youthful demographic profile and rising urban household incomes.
- The middle class, coupled with the rapidly growing domestic consumer market and industrial sector, makes **India an appealing investment destination** for multinational companies.

## Antarctica's Ancient Landscape Revealed

Recently, scientists have unearthed a remarkable find **beneath the icy expanse of Antarctica**, shedding light on a time when the **continent was far from its current icy desolation**.

- In **East Antarctica's Wilkes Land region**, a vast ancient landscape has been discovered, featuring **valleys and ridges sculpted by ancient rivers**.
- It hints at a bygone era when **Antarctica's climate was considerably warmer**, possibly supporting a **diverse array of wildlife**.
  - Antarctica was once part of the **Gondwana supercontinent** before splitting off due to **plate tectonics**.
    - The landscape and flora of Antarctica likely resembled today's cold **temperate rainforests** before it entered a deep freeze.

## Raising Day of Indo-Tibetan Border Police

The **Indo-Tibetan Border Police (ITBP)**, is a dedicated force responsible for safeguarding India's borders with Tibet (China). PM praised their unwavering determination and courage on their **raising day (24<sup>th</sup> October)**, acknowledging their vital role in protecting the nation's border security and integrity.

- The ITBP is a specialized mountain force of India, which was established on **24<sup>th</sup> October 1962**, soon after the India-China war which was initially meant for deployment **along the India-China border**.
- ITBP was initially raised under the **Central Reserve Police Force (CRPF) Act, 1949**. However, in **1992**, parliament enacted the **ITBP Act** and the rules were framed in **1994**.
- However, over the years, ITBP has **also been deployed for various internal security duties, including anti-Naxal operations**. The force is known for its expertise in **high-altitude rescue and mountaineering operations**.

Read More: **Central Armed Police Forces**

## ICT Labs for PM Shri Schools

**Information and Communication Technology (ICT)** labs and Smart Classrooms for **PM Shri schools** are to be introduced in Haryana for adopting modern technology in the classrooms which will enhance the quality of education and provide a better learning experience to the students.

- **PM Shri** is a **centrally sponsored scheme** for upgradation and development of more than **14500 Schools** across the country which aims at strengthening the selected existing schools from amongst schools managed by **Central Government/ State/UT Government/ local bodies**.
- It will showcase all components of the **National Education Policy 2020** and act as exemplar schools and also offer mentorship to other schools in their vicinity.

Read More: **Digital Infrastructure for Knowledge Sharing (DIKSHA), Digital India Mission**

Note:

## Ball Lightning

**Ball lightning**, a rare natural event, is a **luminous sphere** that typically **appears near lightning strikes**.

- It can penetrate **closed windows** and is usually **accompanied by a hissing sound**, and has a lifetime of several seconds.
  - The color is quite variable and the **ball often ends with an explosion**. However, it is **not usually destructive**.
- Also, it is sometimes called **globe lightning**, these spheres are **thought to be composed of plasma**, an ionized state of matter with freely moving ions.

## Supreme Court Rectifies Long-standing Employment Issue

In a recent landmark decision, the **Supreme Court** has rectified a **30-year-old injustice in a public employment case**.

- The Court invoked its powers under **Article 142 of the Constitution**, ordering the concerned department to appoint an individual to a probationary position for 10 years.
  - **Article 142** of the Constitution grants the Supreme Court the unique authority to deliver “**complete justice**” in situations where the law or statutes may not offer a remedy.
- SC held that a **public employer**, which falls under the ‘**state**’ category as per **Article 12 of the Constitution**, cannot dismiss a candidate from job consideration without a valid and justifiable reason.
- The ruling underscores the **importance of clear and fair eligibility criteria** from the outset of a selection process and reaffirms the **principle of non-discrimination in public employment**.

Read more: **Supreme Court**

## Exercise MILAN 2024

The **Mid Planning Conference (MPC)** of **MILAN 24 (Multilateral Naval Exercise - 2024)**, to be hosted by the **Indian Navy** at Visakhapatnam during Feb 2024, was conducted by the **Eastern Naval Command (ENC)**.

- **MILAN** is a **biennial multilateral naval exercise** incepted by Indian Navy in **1995** at Andaman and Nicobar Command.

- Starting with the participation of only four countries, viz **Indonesia, Singapore, Sri Lanka and Thailand**, in the 1995 edition, the exercise has since transitioned leaps and bounds in terms of number of participants and complexity of exercises.
- Originally conceived in consonance with India’s ‘**Look East Policy**’, MILAN expanded in ensuing years with India’s ‘**Act East policy**’ and **SAGAR Initiative**, to include participation from island nations in the **Western IOR (Indian Ocean Region)** as also IOR littorals.

Read More: **Andaman and Nicobar Command**

## UN's 78<sup>th</sup> Anniversary

Recently, the World has celebrated the 78<sup>th</sup> anniversary of the **United Nations (UN)** on 24<sup>th</sup> October 2023.

- **United Nations Day** is an annual event that commemorates the anniversary of the entry into force of the UN Charter in 1945. It is **celebrated on 24<sup>th</sup> October to promote awareness and understanding of the UN's goals and achievements**.
- The forerunner of the United Nations was the **League of Nations**, an organization conceived in circumstances of the **First World War**, and established in **1919** under the **Treaty of Versailles** “to promote international cooperation and to achieve peace and security.”
- The UN has 6 components which were established in 1945 such as the **General Assembly, Security Council, Economic and Social Council, Trusteeship Council, International Court of Justice, UN Secretariat**.

Read More: **Food and Agriculture Organization (FAO), International Maritime Organization (IMO)**

## Exercise Harimau Shakti 2023

The joint bilateral training exercise between India and Malaysia, “**Exercise Harimau Shakti 2023**,” commenced at **Umroi Cantonment**, featuring a **Battalion of the Rajput Regiment** from the Indian contingent and **Malaysian Army's 5th Royal Battalion**.

- This exercise, involves establishing a **Joint Command Post**, integrated surveillance grid, and **Joint Surveillance Centre**, emphasizing joint force deployment in various environments, intelligence operations, the use of drones and helicopters, casualty management, and logistics.

Note:



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- The exercise underscores the strengthening of defense cooperation between the **Indian and Malaysian armies**, further fostering bilateral relations between the two nations.

Read more: **India-Malaysia Defence Cooperation**

## National Cooperative Exports Limited

The **National Cooperative Exports Limited (NCEL)**, established as an umbrella organization for **cooperative sector exports**, has made substantial progress, receiving orders valued at Rs 7,000 crore.

- The Union Minister of Cooperation emphasized that a significant portion of export profits, **approximately 50%, will directly benefit farmers through the NCEL**.
  - The NCEL, an umbrella body for cooperative sector exports registered under the Multi-State Co-operative Societies Act, 2002.
- NCEL is launched in the cooperative sector with 6 objectives of **increasing exports, prospering the farmer, changing the crop pattern**, providing a global market for organic products, gaining a place for India in the global market for biofuel and strengthening the cooperative sector.

Read more: **Promoting Cooperatives in India**

## IMPHAL-Third Stealth Destroyer of Project 15B

The delivery of the **third Project 15B Indigenous Destroyer Imphal** to the Indian Navy is significant as it is a part of India's ongoing efforts to modernize its navy.

- The Project is a follow-on of the **Kolkata class (Project 15A)** destroyers commissioned in the last decade. It is equipped with state-of-the-art weapons and sensors, including surface-to-air missiles, anti-ship missiles and torpedoes.
- It is powered by a **Combined Gas and Gas propulsion set**, comprising four gas turbines, and is capable of achieving speeds in excess of 30 knots (56 km/h).
- The Imphal is the **third ship in the series of four Project 15B destroyers being built by Mazagon Dock Shipbuilders Limited (MDL)** under the **'Make in India'** initiative.

- The purpose of the **BrahMos supersonic cruise missiles** on the Imphal destroyer is to provide the Indian Navy with a highly capable and versatile weapon system.

Read More: **Project 17A, Agni 5 Ballistic Missile**

## Gujarat's Dhordo -Best Tourism Village

Dhordo has been conferred the prestigious title of **Best Tourism Village by the United Nations World Tourism Organisation (UNWTO)**. Dhordo received this title at the **Best Tourism Village - 2023 award** ceremony organized by the UNWTO at Samarkand in Uzbekistan.

- The village has become a popular tourist destination due to its rich cultural heritage, handicrafts, and the famous **Rann Utsav**.
- The UNWTO awards the title of **"Best Tourism Village"** to villages that meet certain criteria.
  - The criteria include promoting **sustainable tourism, preserving local culture and heritage, providing a safe and welcoming environment for tourists, and offering unique experiences to visitors**.
  - Additionally, the village must have a **well-developed tourism infrastructure** and must be able to demonstrate its commitment to responsible tourism practices.

Read More: **World Tourism Day, UN Specialized Agencies**

## Cyclone Tej Intensifies

**Cyclone Tej**, initially forming over the **Arabian Sea**, has intensified into an extremely severe cyclonic storm, with projections indicating a northwestward trajectory and an expected landfall near **Al Ghaidah (Yemen)**.

- **The name 'Tej,'** which means 'speed' in Hindi, **was chosen by India**.
- A **yellow alert has been issued by India Meteorological Department (IMD)** for eight districts in Kerala, warning of heavy rains.
- **IMD, established in 1875**, is an agency of the **Ministry of Earth Sciences**.
  - IMD uses **colour-coded weather warning** to alert people ahead of severe or hazardous weather which has the potential to cause damage, widespread disruption or danger to life.

Note:



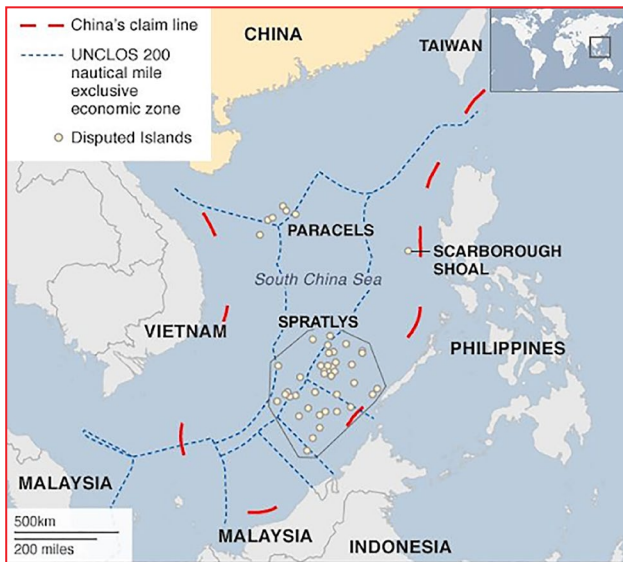
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No Severe Weather	Be Aware	Be Prepared	Take Action

Read more: [Colour-Coded Warnings by the IMD](#)

## Collisions Between Chinese and Philippine Vessels

Tensions in the **South China Sea** escalated as **China and Philippines** traded accusations following two collisions between **Chinese vessels and Philippine boats** during a resupply mission near **Second Thomas Shoal** in the disputed **Spratly Islands**.



Read more: [South China Sea](#)

## REC Limited Honoured with Golden Peacock Award

**REC Limited (formerly Rural Electrification Corporation Limited)** a **Maharatna** Central Public Sector Enterprise under the Ministry of Power, has received the **Golden Peacock Award in Risk Management** for its commitment to implementing **effective risk assessment strategies**.

- The Golden Peacock Awards, established by the **Institute of Directors (IOD)**, India in 1991, has emerged as an internationally acclaimed **standard for corporate excellence**.

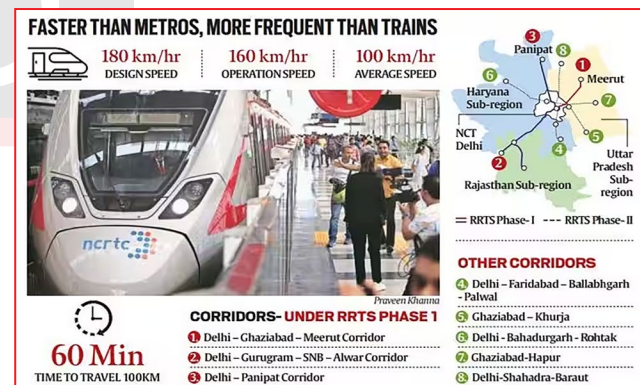
- The IOD is an apex professional association for Directors in India under the **Societies Registration Act, XXI of 1860** to fill the need for professional development of **Corporate Directors and building effective Boards**.

- REC Limited is a **Non-Banking Financial Company (NBFC)** focused on Power Sector Financing and Development in India. It provides financial assistance to various entities in the power sector.
- REC's funding contributes to **lighting every fourth bulb in India**.

Read more: [Maharatna Status to REC](#)

## Regional Rapid Transit System (RRTS)

Prime Minister Narendra Modi will inaugurate the first leg of the **Regional Rapid Transit System (RRTS)** also known as **Namo Bharat**, in the **National Capital Region (NCR)**, India's first mass rapid system dedicated to regional connectivity.



Read More: [PM Gati Shakti Scheme, Dedicated Freight Corridor](#)

## Green Energy Corridor Phase-II – Inter-State Transmission System

The Cabinet Committee on Economic Affairs, has approved the **Green Energy Corridor (GEC) Phase-II - Inter-State Transmission System (ISTS)** for a **13 GW Renewable Energy Project in Ladakh**.

- The project is aimed to be set up by FY 2029-30. **Power Grid Corporation of India Limited (POWERGRID)** will be the Implementing Agency.

Note:



- The project will contribute to **achieving the target of 500 GW of installed electricity capacity from non-fossil fuels by year 2030**. Promote ecologically sustainable growth by reducing **carbon footprint**.
- The project will generate large **direct & indirect employment** opportunities especially in the Ladakh region.
- This project is in addition to **Intra-State Transmission System Green Energy Corridor Phase-II (InSTS GEC-II)**, already underway in several states for grid integration and power evacuation of approximately. **20GW of RE power and is expected to be completed by 2026**.

Read more: [Green Energy Corridor](#)

## Bathukamma Festival

The nine-day-long annual festival of flowers **Bathukamma** began on a colorful note across Telangana.

- It is a colorful floral festival celebrated by **women with exotic local flowers**.
  - The festival coincides with the **monsoon, bringing water to ponds and wildflowers in vibrant colors**.
- The festival begins **a week before the 'Saddula Bathukamma'** (the grand finale of the Bathukamma festival) which **falls two days before Dussehra**.
  - During the entire preceding week, women make **'boddemma' (a deity of Gowri – mother Durga – made with earthly mud)** along with Batukamma and immerse it in the pond.
  - This helps **reinforce the ponds and helps it retain more water**.
- The festival reinforces the bond between **humans, the earth, and water, with rituals aimed at preserving natural resources**.

## Estivation

Recently, estivation, an intriguing **animal survival strategy** during hot and dry summers, has gained recognition for its remarkable **adaptations to extreme conditions**.

- Estivation is a biological phenomenon whereby the **animal enters a long period of dormancy, or inactivity**, in response to **high temperature or maybe even drought-like conditions** to **conserve energy** and water in a difficult time.

- It helps animals avoid **desiccation**, a condition characterized by **extreme dryness of the skin and shields them from the risk of predation**.
- Examples of Estivation:
  - **West African lungfish (*Protopterus annectens*)** burrows into the mud of a drying water body and secretes a cocoon of mucus around itself during a drought.
  - **Desert tortoises (*Gopherus agassizii*)** dig burrows and retreat into them in hot summer months.

## Maiden Test Flight of Gaganyaan

The **Gaganyaan mission's Flight Test Vehicle Abort Mission-1 (TV-D1)** will take place on 21<sup>st</sup> October 2023 from the **Satish Dhawan Space Centre** in Sriharikota.

- TV-D1 will demonstrate the performance of the **Crew Escape System**.
- The ultimate aim of Gaganyaan project is to demonstrate human spaceflight capability by launching a crew of **3 members to an orbit of 400 km for a 3 days mission** and bring them back safely to earth, **by landing in Indian sea waters**.

Read more: [Gaganyaan mission](#)

## 69th National Film Awards

Recently, the **President of India** presented **69<sup>th</sup> National Film Awards** in various categories in New Delhi.

- As a part of the event, the **Dadasaheb Phalke Lifetime Achievement Award** for the year 2021 was presented to **Ms. Waheeda Rehman**.
- **Dadasaheb Phalke**, also known as the **"Father of Indian Cinema,"** was a prominent film director, producer, and screenwriter who is credited with making India's first full-length feature film, **Raja Harishchandra, in 1913**.
  - Phalke was a pioneer in Indian cinema and made over 100 silent films during his career.

Read more: [Dadasaheb Phalke Award](#)

## RITES Ltd, and IRCON Awarded Navratna Status

The Ministry of Finance has conferred the esteemed **'Navratna' status** upon two Central Public Sector

Note:



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Enterprises (CPSEs) under the **Ministry of Railways, Ircon International Limited (IRCON) and RITES Ltd (RITES).**

- Navratna Companies in India are a group of CPSEs that **have enhanced financial autonomy** and flexibility to compete in the global market. They are given certain privileges, such as **investing up to Rs 1,000 crore without explicit government approval.**
- The **Navratna status was first introduced in 1997.** There are currently 16 Navratna Companies in India.
  - To attain Navratna status, a firm must initially hold the **Miniratna designation** and it needs to achieve a score of **60 or more (out of 100) according to six performance criteria**, which include metrics like Net Profit to Net Worth, Earnings per Share, and Inter-Sectoral Performance.

**Read more: Sectors of Indian Economy**

## World Spine Day 2023

Every year on **October 16<sup>th</sup>, World Spine Day (WSD)** raises awareness about **spine health.**

- **Theme for 2023:** "Move Your Spine", which emphasizes the role of physical activity and movement in preventing and managing spinal pain and disability.
- WSD was initiated in **2008 by the World Federation of Chiropractic (WFC)**, which coordinates the event in collaboration with various organizations around the world.
  - The purpose of WSD is to educate people about the causes, prevention, and treatment of spinal disorders, and to **encourage them to take care of their spines.**

**Read more: Multiple Sclerosis**

## World White Cane Day

**World White Cane Day** is observed **globally on 15<sup>th</sup> October** aimed at promoting accessibility and inclusion for **individuals with disabilities**, particularly the visually impaired.

- Also known as White Cane Safety Day, the day was first recognised in **1964** in the United States by **President Lyndon B Johnson.**
- A white cane is a **navigation or identification aid** for people living with sight loss. It is a powerful symbol for visually impaired individuals, representing **independence, mobility, freedom, and confidence.**

**Read more: Person with Disabilities in India**

## Coastal Security Exercise-East Coast Sagar Kavach 2023

A comprehensive **Coastal Security Exercise Sagar Kavach 02/23** involving all maritime security agencies was conducted by the Indian Navy in Andhra Pradesh, Tamil Nadu and the UT of Puducherry.

- The exercise was closely monitored at **Joint Operations Centre (East) at Visakhapatnam** which is the nodal hub for all coastal security operations and exercises in the area of operations.
- Enhanced security measures were instituted and extensive aerial surveillance undertaken by **Dornier aircraft** and helicopters.
- Lessons learnt from the exercise would be incorporated to **strengthen the coastal security architecture.**

**Read More: Marine Police Force, Coastal Security Architecture**

## World Food Day, 2023

**World Food Day** is celebrated to commemorate the establishment of the **United Nations Food and Agriculture Organisation (FAO)** on **16<sup>th</sup> October 1945.**

- The emphasis of World Food Day celebrations every year is on the furtherance of food security all over the world.
- For the year 2023, the theme of the World Food Day is – **"Water is life, water is food. Leave no one behind".**
- It emphasizes attainment of **Sustainable Development Goal 2 (SDG 2)** i.e. **Zero Hunger.**

**Read More: Global Hunger Index , Food Security Act, 2013**

## Five New Sports in Olympic Games

Recently the proposal from the **Organising Committee of the Olympic Games Los Angeles 2028 (LA28)** to include five new sports in the programme has been accepted by the **International Olympic Committee (IOC) Session** (held in Mumbai)

- **Cricket (T20), Baseball/softball, flag football, lacrosse and squash** will be in the programme at LA28.

Note:



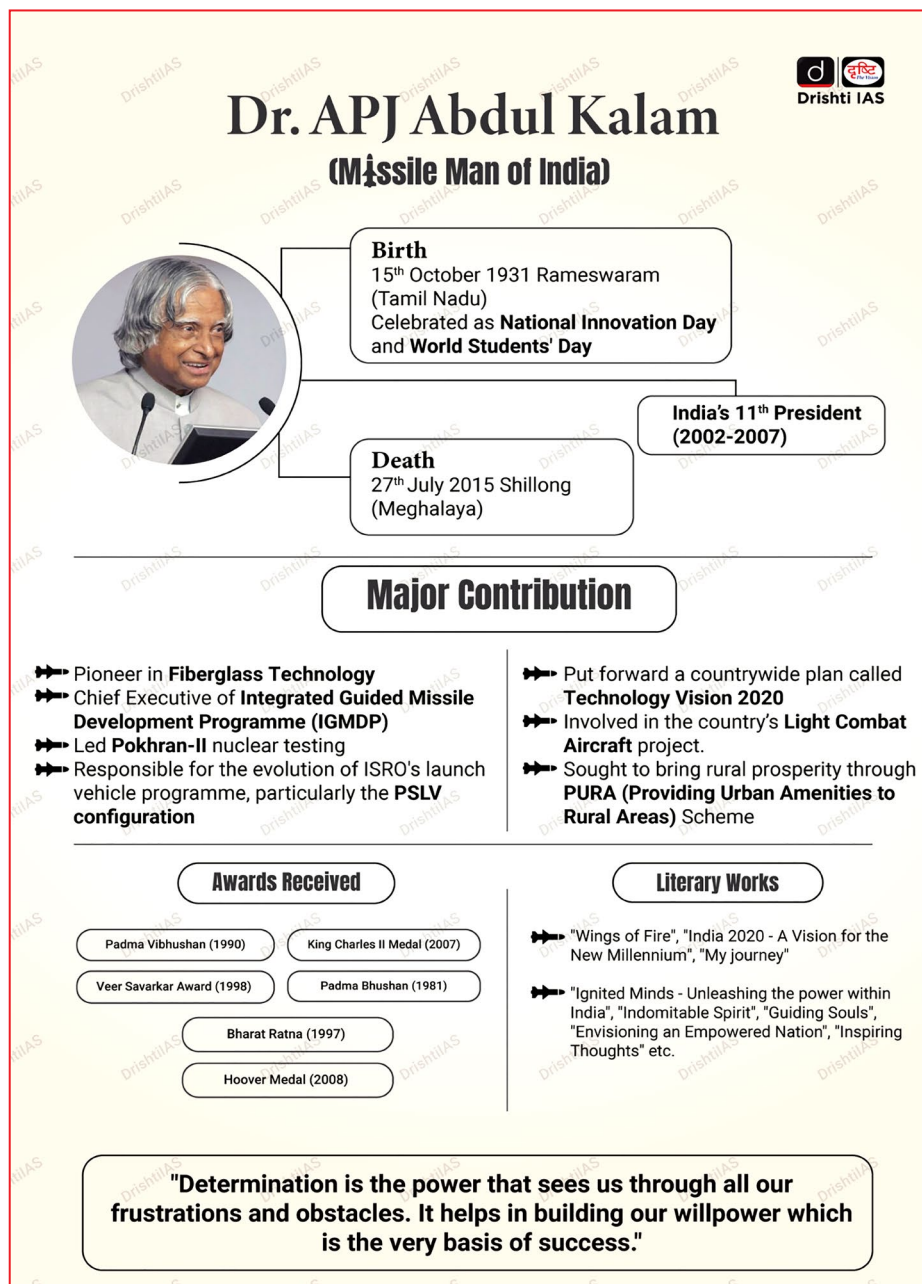
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- The IOC is the guardian of the Olympic Games. Established in **June 1894**, the IOC is a not-for-profit independent international organization.
  - Based in **Lausanne, Switzerland**, the **Olympic Capital**, it is entirely privately funded.

## World Student's Day, 2023

India observes **World Students' Day on October 15**. It is celebrated to mark the birth anniversary of the former President of India **Dr. APJ Abdul Kalam**. This day has been observed globally since 2010, paying tribute to Dr Kalam's **remarkable contribution to education and his dedication to nurturing young minds**.

- The **theme** for World Students Day 2023 is **"FAIL: stands for First Attempt in Learning."**



Read More: **Vice President of India, Presidential Election**

Note:

**Key Points**

**Details**


**Summary**

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**Summary**