



Monthly  
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## NOTE:

Dear Students,

Memorisation and recollection of information in Current Affairs is as important as understanding the articles. In order to enhance the learning outcomes from the Monthly Current Affairs Magazine, we are introducing following additions:



A thematic based colors has been used in the document in the boxes, tables etc to enable easy identification and recollection of various concepts and topics.



Questions are an important tool to assess and retain information. To enable this we are adding a Smart Quiz at the end of each section in the document for practicing the questions.



A wide variety of infographics have been added to ensure smoother learning experience and enhanced retention of the information. This will also help in effective presentation of information in the answer writing as well.



Places and persons in news are being presented in an objective manner through Maps, Tables & Pictures. This will help in easier recollection of factual information.



# 1. POLITY AND GOVERNANCE

## 1.1. DIGITALISATION OF LAND RECORDS IN INDIA

### Why in news?

To boost the digitalisation of land records in India, the central government has asked the state governments to install local servers as well as increase internet speed in sub-registrar offices.

### More on the news

- The government is **also planning to come up with an online registration system under the Digital India Land Records Modernization Programme (DILRMP)**.
  - It is being implemented by the **Union Ministry of Rural Development**.

### About Digital India Land Records Modernization Programme (DILRMP)

- It is a **central sector scheme** launched in 2016.
- The **DILRMP has 3 major components**:
  - Computerization of land record;
  - Survey/re-survey
  - Computerization of Registration.

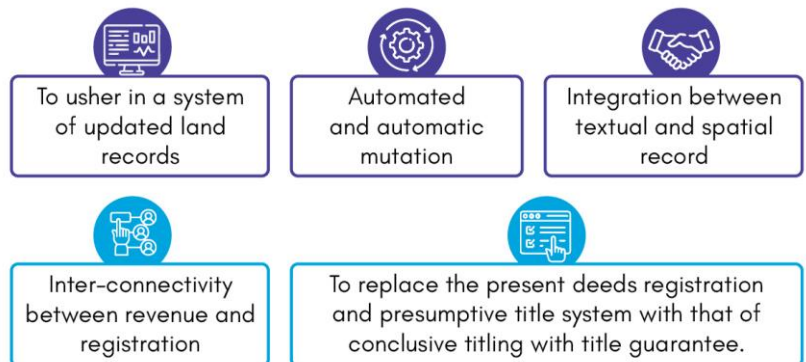
### Significance of digitalization of land records

- **Better credit delivery in rural areas:** Creation of vast bankable assets across rural India can help in credit growth, especially in agriculture and MSME sectors.
- **Reduced litigation:** Enhanced transparency in the land records maintenance system will minimize the scope of land disputes.
- **Infrastructure: Facilitates development of new infrastructure** by easing process of land acquisition and rehabilitation and settlement of compensation claims.
- **Revenue Generation: Enhanced local revenues** through improved property tax billing and collection.
- **Enhanced efficiency of policy making:** Digitization will help improve policy makers make informed decisions regarding land value assessment, land use planning, environmental protection and resource management.
- **Check on fraudulent transactions:** Generation of black money through Benami transactions could be pre-empted and eliminated by the digitization of land records and their regular updation.
- **Easy disbursement of benefits of welfare schemes** implemented by Central and State Governments such as crop insurance, grant of agricultural subsidy etc.
- **Cut down the human interface in registration process:** This will **lower processing time of document registration** and **reduce corruption** related to transfer, buying and selling of land, and land titles.

### Current Status of Digitalisation of Land Records in India

- **Computerization of Land Records (Record of rights)** has been completed in 94% of villages.
- **Around 29 States/UTs** have displayed Record of Rights (RoRs) on Web.
- **Integration of land records & property registration** has been done in 75.78 % of Sub-Registrar Offices.
- **70.41 % of Cadastral Maps have been digitized.**
  - Cadastral maps mark the real estate boundaries and division of land to define the ownership and purpose of the land.
- **Textual and spatial data integration** has been completed for 60.67 % of villages.

### OBJECTIVES OF DILRMP



### How is Land ownership recognised in India?

Land ownership in India is recognised through a set of documents including-

- **Record of rights (RoR)**, which captures details such as the name of the land holder, the number and size of the plot area, and revenue rate (for agricultural land),
- **Registered sale deed** to prove that the property has been sold from one person to the other, and the taxes on the sale have been paid,
- **Survey documents** to record a property's boundaries and area, and prove that the property is listed in government records,
- **Property tax receipts.**

## Constraints in Digitalization of land records in India

- **Legacy issues:** Digital records have inherited the bad data from the old documents reflected in never-surveyed villages, missing maps and lack of updated surveys with modern tools.
- **Sub-standard data collection:** Land portals in several states suffer from serious inadequacies.
  - Inadequacies like **the wrong data entry, lack of standardised information, mismatch in the digital data and information on the older paper records**, inaccurate estimation of extent of land and so on.
  - Mismatch in data sets could potentially invite further legal disputes.
- **Limited capacity of the administration:** Stake holders and employees, especially at ground level, lack appropriate technical skills required for digitalization.
- **Non-uniformity across the states:** Land and its management fall under the jurisdiction of the states, leading to lack of data standardization among different states.
- **Lack of coordination between the various nodal agencies handling land records** like the revenue, survey and registration overseeing the land make it cumbersome to access them.
- **Digital gap:** Digitization of land records could make it difficult for poor and vulnerable sections, to establish their titles, as several old land titles are non-traceable.
- **Data leaks and threat of cyber-attacks:** Digital presence of property ownership documents can potentially leave the personal data vulnerable to theft.
- **Potential for consumer profiling:** Information like the size of a plot of land compounded with the average cost of land in the area of ownership may be used to indicate the financial situation of the landowner and lead to their profiling.
- **Trust issues:** Any instances of malicious manipulation of digital land records can raise concerns among landowners about loss of landholding, State encroachment, corrupt practices etc.
- **Other issues:** Lack of gender inclusivity in land record management, impact of persisting land conflicts, absence of fast internet connectivity and data servers, etc.

### Other measures taken to promote digitization

- **National Generic Document Registration System (NGDRS)** is an in-house advanced software application for the registration system developed by NIC.
- **Unique Land Parcel Identification Number (ULPIN) System** provides a unique ID of 14 digits for every plot of land in the country based on the Georeference coordinate of vertices of the parcel.
- **BhuNaksha:** A Solution for digital Cadastral Mapping.
- **Survey of Villages Abadi and Mapping with Improved Technology in Village Areas (SVAMITVA)**\_scheme aims to demarcate inhabited (*Abadi*) land and provide Record of Rights/Property Cards in rural areas through the latest surveying drone technology.
- **Initiative to transliterate the Records of Rights to any of the 22 languages** recognised by the Constitution.
- **Efforts at the State level:**
  - **Bhoomi is a project jointly funded by the Centre and the state of Karnataka** to digitise the paper land records and create a software mechanism to control changes to the land registry in Karnataka.
  - **Telangana's Dharani project** integrates RoR data with individual land plot maps.

## Way forward

- **Providing government employees appropriate skills** through comprehensive training programmes.
- **Adopt and implement security management systems** for safely storing land record data and building trust among landowners.
- **Undertake surveying and mapping of the land** using the new technologies such as blockchain, drones, satellite imagery, GIS etc. to ensure true ground depiction on maps and land records.
- **Build capacity among states** for by establishing dedicated data centers, high speed processors and fiber optic networks etc. at the state level.
- **Update all textual data** prior to digitization by including old titles, mutation records and record or rights.
- **Conduct awareness generation programmes** regrading digital processes and applications related to land registration.
- **Build uniform standards** for recording, maintaining and updating land records.

## 1.2. PREVENTIVE DETENTION

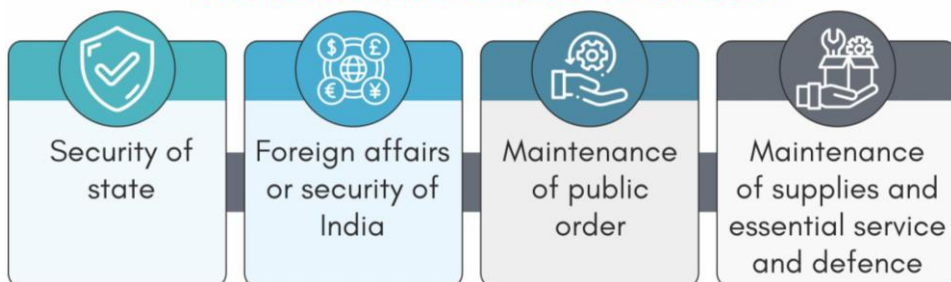
### Why in news?

Recently, Supreme Court has ruled that the preventive detention is to be used only in exceptional circumstances.

### More on news

- The Supreme Court in an order observed that preventive detention is an **exceptional power of the State which affects the personal liberty of the individual and has to be employed sparingly.**
  - The court distinguished between law and order situations and public disorder. Preventive detention may apply in the latter but never for the former situation.
- The bench referred to the **1982 SC decision in 'Ashok Kumar vs Delhi administration'** case which said preventive detention is devised to afford protection to society.
  - The objective is **not to punish a man for having done something but to intercept** before he does it and to prevent him from doing.

### Grounds for Preventive Detention



### About Preventive Detention

- It is the **detention of a person on a mere reasonable apprehension of him doing an activity dangerous to public order and security.**
  - Here, the person is **confined in custody without undergoing a trial.**
- Constitution gives **protection against arrest and detention under Article 22 (1) and 22 (2).**
  - These protections are **not available to a person arrested or detained under preventive detention laws (Article 22(3)).**
- **Multiple laws** such as Code of Criminal Procedure, Narcotic Drug and Psychotropic Substance Act (NDPS) 1985, Unlawful Activities (Prevention) Act etc. permit Preventive Detention.
  - According to the **NCRB 'Crimes in India Report 2021'**, over 1.1 lakh people were placed under Preventive Detention in 2021, highest since 2017.
- The **Criminal Procedure Code of India also provides for Preventive detention under Section 151.**
  - According to **Section 151 of the Code of Criminal Procedure**, the police are empowered to make preventive arrests if they believe they must do so to prevent the commission of "any cognisable offence".

### CONSTITUTIONAL SAFEGUARDS AGAINST PREVENTIVE DETENTION



#### Article 22 (1)

- **No person can be detained in custody without being informed of grounds of arrest** or shall be denied right to consult or be defended by legal practitioner.



#### Article 22 (2)

- Every person who is arrested/ detained in custody shall be **produced before magistrate within 24 hours** of such an arrest.
- **No person can be detained beyond 24 hours without authority** of magistrate.



#### Article 22 (3)

- Above two clauses will not apply to a person who is detained in accordance to a law providing for preventive detention.



#### Article 22 (4)

- **No person can be detained for more than a period of 3 months unless an advisory board confirms** that there is sufficient cause for continuation of such detention.
- **Exception to Article 22(4)** has been provided in **Article 22(7) (b)** itself.



#### Article 22 (7) (b)

- A person can be preventively **detained for more than 3 months without opinion of an advisory board** if Parliament by law provides–
  - ▶ **Maximum period of such detention.**
  - ▶ **Circumstances, classes of persons and classes of cases** to which such a law may apply.

## Issues associated with Preventive Detention

- **Executive Tyranny:** Preventive detention laws are designed to be **highly administratively steered and restrict the scope of judicial interference.**
- **Violate Fundamental Rights:** Under preventive detention fundamental rights of the detainee under article 21 (Protection of life and liberty, due process), 19 (Freedom of Expression), 14 (Right to Equality) are breached to a greater extent than in the arrest.
- **Misuse:** Instances of **misuse of preventive detention are on a rise** and it has been used to curb dissent and freedom of the citizens.
  - For instance, **78.33% of all detention orders under National Security Act (NSA)** from 2018 to 2020 were found to be incorrect.
- **Backlogs:** Pending cases are **overburdening courts**, so hearing writ petitions against preventive detention orders can take several months. As a result, the process becomes the persecution.
- **Advisory Board:** The eligibility criteria set by the Constitution for the members of the advisory board under Article 22 gives the State the power to make it a purely executive committee.
  - Such a committee **cannot be regarded as impartial or free from political influence.**
- **Victimisation of the detainee:** Long-time taken by legal system to dispose detention cases, combined with non-availability of redressal mechanism other than filing writ petitions leads to victimisation of the detainee.

### Laws Providing for Preventive Detention in India

- **First Preventive Detention Act (1950)** was passed to prevent anti-national elements from carrying out acts that are hostile to Nation's security and defence.
- **Maintenance of Internal Security Act (MISA) (1971-77)** is infamous for its excesses during emergency when it was aggressively used against political opponents, trade unions and civil society groups that challenged the government.
  - **44th Amendment Act of 1978 removed MISA.**
- **Foreign Exchange and Prevention of Smuggling Activities Act, 1974** provided for preventive detention to maintain and improve foreign exchange and to deter illegal trade.
- **Terrorist and Disruptive Activities (Prevention) Act (TADA) 1985** is deemed to be most powerful and restrictive laws drawn up under the system of preventive detention.
- **Prevention of Terrorism Act (POTA) 2002** was presented as an act similar to TADA.

## Way forward

- **Legal representative:** Detainee should be provided **right to consult, represented by a lawyer of his choice at any stage** to ensure that the defence is effectively put before advisory board and to aid informed decision making.
- **Advisory Board:** It should consist of only **sitting judges of High Courts to ensure speedy trial, effective and fair decision** making while deciding validity and extension of detention.
- **Timeframe:** Detention order should be made effective only after approval by advisory boards within a prescribed timeframe. So that, detainee is not forced to be in detention for too long just by executive order.
- **Independent body:** A commission should be formed to enquire into allegations of misuse of preventive detention, allegations of coercive use of authority etc. to **enhance transparency and prevent misuse.**
- **Constitutional safeguards:** Preventive detention must abide by provisions under Article 21 (due process of law) and Article 22 (safeguards against arbitrary arrest and detention) along with the statute in question.

### Supreme Court on Preventive detention

- **AK Gopalan Vs State of Madras (1950):** The court gave a **green flag to the Preventive Detention Act** because of the presence of the explicit provisions of Article 22(5).
- **ShibbanLal v. State of Uttar Pradesh:** The Supreme Court of India stated that a **courtroom isn't even competent to enquire into reality or in any case of the facts** which are referenced as the grounds of detainment.
- **Shambhu Nath Shankar Vs State of West Bengal:** Although the concept of Preventive detention in itself is draconian and infringes the fundamental rights guaranteed in the constitution, **sometimes it is necessary for the state to take such extreme steps to maintain the security of the country.**



## 1.3. NEWS IN SHORTS

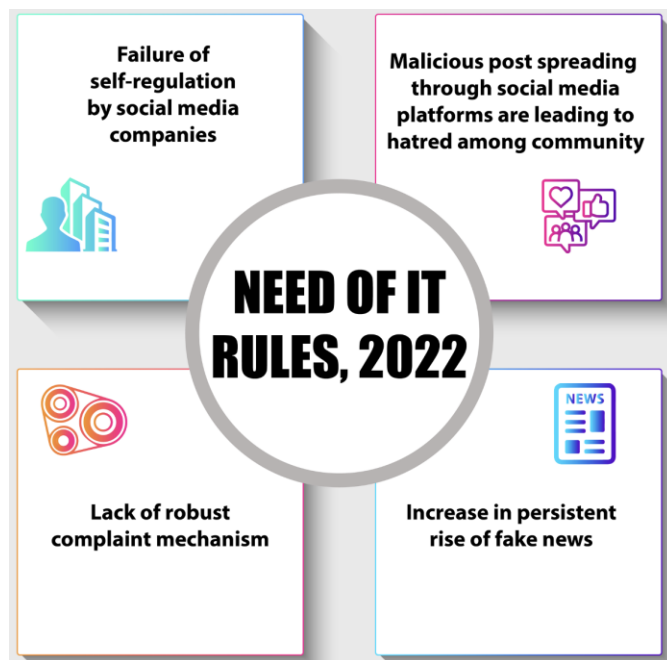
### 1.3.1. GOVERNOR AND COUNCIL OF MINISTERS

- Recently, Kerala Governor **threatened to remove Ministers from their posts** if they continued to lower the dignity of his office.
- Article 164 of the Constitution provides** that the Chief Minister shall be appointed by the Governor.
  - The other Ministers shall be appointed by the Governor on the advice of the **Chief Minister**.
  - Additionally, CM and the Ministers shall hold office during the pleasure of the Governor.**
  - However, pleasure of the governor has not been defined.
- But there have been **instances of Governors dismissing Chief Ministers**, but those were related to constitutional situations in which the **legislative majority of the incumbent government was lost**.
- Various judicial pronouncements for Pleasure of the Governor**
  - Mahabir Prasad v. Prafulla Chandra 1969**, the **governor's pleasure under article 164(1) is subject to Article 164(2)**.
    - ✓ Thus the withdrawal of the governor's pleasure must coincide with the withdrawal of support to the government by the assembly.
  - In **Shamsher Singh & Anr vs State of Punjab (1974)**, SC declared that Governor shall exercise his formal constitutional powers only in accordance with the advice of their Ministers.
  - In **Nabam Rebia and etc vs Deputy Speaker and ors (2016)**, SC ruled that Article 163 of the Constitution does not give the Governor a general discretionary power to act against or without the advice of his Council of Ministers.
- Thus, as per the current understanding, **the Governor cannot remove the ministers at his own will**.

### 1.3.2. CENTRE NOTIFIES INFORMATION TECHNOLOGY (INTERMEDIARY GUIDELINES AND DIGITAL MEDIA ETHICS CODE) AMENDMENT RULES, 2022

- IT Rules 2021 has been **released under section 87 of IT Act, 2000** for Social-Media, Digital Media and OTT platforms.
- Key provisions**
  - Grievance Appellate Committees (GAC):** The Central Government shall establish **one or more Grievance Appellate Committees (GAC) within three months**.

- ✓ Each GAC will consist of a **chairperson and two whole time members** appointed by the Central government.
- ✓ The GAC will **hear appeals by social media users against decisions of grievance officers** appointed by the intermediary.
  - Dispute Resolution Mechanism:** Online dispute resolution mechanism, i.e. digital mode of the entire appeal process, from filing of appeal to the decision.
  - Obligations for intermediary:** Intermediaries can develop and implement “appropriate safeguards” to prevent misuse of the grievance redressal mechanism.
  - Time bound:** The companies will be required to acknowledge complaints from users within 24 hours and resolve them within 15 days or 72 hours in case of an information takedown request.
- Concerns with IT rules**
  - Excessive government control.
  - Can act as an effective tool to curb government criticism and dissent.
  - Additional responsibilities on grievance officers.



### 1.3.3. PSYCHOLOGICAL TEST OF DEATH ROW CONVICTS

- In a significant order, SC has **reiterated the importance of conducting a psychological evaluation** of convicts who have been awarded death sentences. It called for:
  - Psychological evaluation of condemned prisoners** by expert doctors

- Access to them by mitigating investigators.
- It held this will aid Court to have an independent and holistic picture of the physical and mental condition and background of the condemned person.
- **Death Penalty** or capital punishment is the execution of an offender **sentenced to death after conviction by a court of law for a criminal offense.**
  - Constitution give **power to President of India and the Governor** respectively to grant **pardon and to suspend, remit or commute** death penalty in certain cases.
- **Landmark judgements related to death penalty:**
  - **Bachan singh v/s State of Punjab:** Supreme court pointed out **only in the rarest of rare cases** that are brutal, the death penalty should be imposed.
  - **Machhi Singh and others v the State of Punjab:** Supreme court stressed **weighing aggravating**

**factors of the crime against the mitigating factors of the criminal** before awarding death penalty.

#### 1.3.4. GRIEVANCE REDRESSAL INDEX (GRI)

- Unique Identification Authority of India (UIDAI) **topped GRI** for the second consecutive month.
  - UIDAI is a **statutory authority** established under **provisions of Aadhaar act 2016.**
  - **Administrated by:** Ministry of Electronics & Information Technology.
- GRI is published by **Department of Administrative Reforms and Public Grievances** every month.
  - It **ranks Ministries, Departments and Autonomous Bodies.**



**SMART QUIZ**

You can scan this QR code to practice the Smart Quiz of Polity at our open test online platform for testing your understanding and recalling of the concepts.



## 2. INTERNATIONAL RELATIONS

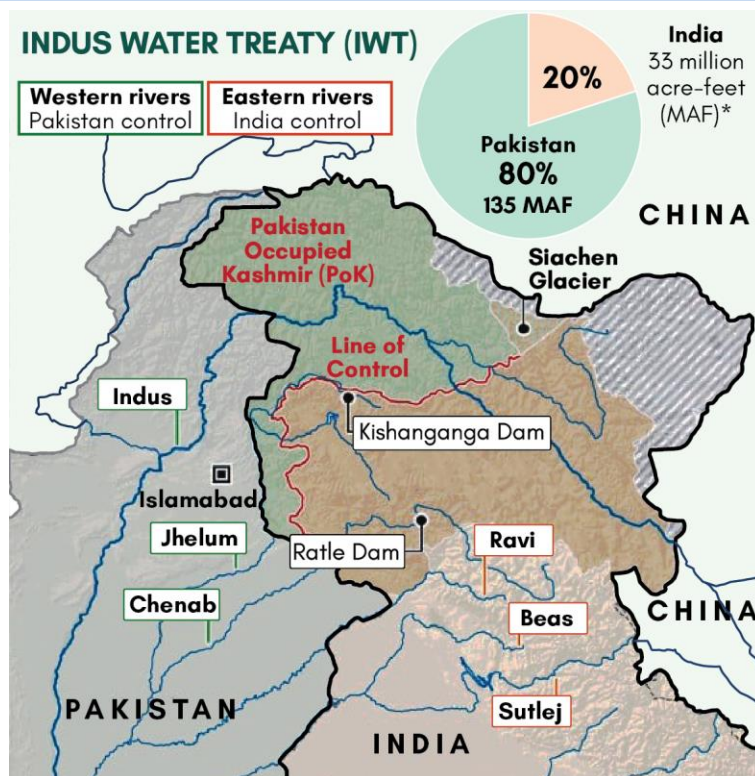
### 2.1. INDUS WATER TREATY (IWT)

#### Why in news?

The World Bank has appointed a **Neutral Expert (NE)** and a **Chairman of the Court of Arbitration (CoA)** regarding the Kishenganga and Ratle hydroelectric power plants.

#### More on the news

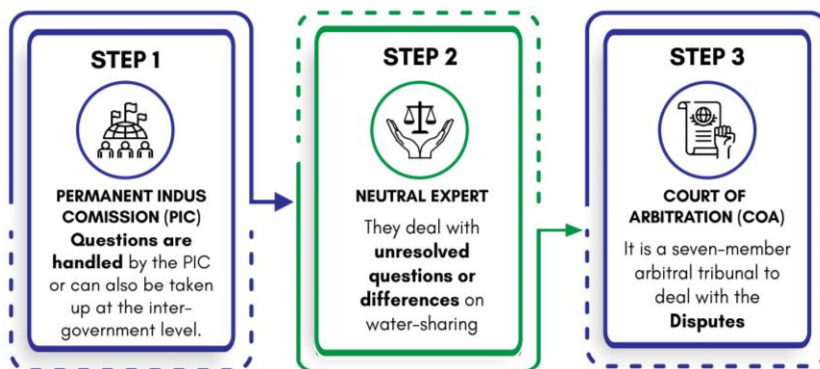
- The appointments were **made under the Indus Water Treaty (IWT)** to resolve the disputes between India and Pakistan over India's **run-of-the-river hydroelectric projects**.
  - Kishanganga Hydroelectricity Project (KHEP) located on Kishanganga or Neelum, a tributary of Jhelum, **was inaugurated in 2018**.
  - Ratle Hydroelectric Plant (RHEP)** is being constructed **on the Chenab Rivers**.
  - The **World Bank is not financing either project**.
- Earlier, **Pakistan had asked the World Bank to facilitate the establishment of a Court of Arbitration** to consider its concerns about the designs of the two hydroelectric power projects.
  - While India had asked for **the appointment of an NE to consider similar concerns over the two projects**.



#### About the IWT, 1960

- Since both countries were dependent on water from the Indus river basin for their irrigation, equitable distribution and infrastructure was needed.
  - In 1951, the **World Bank offered to mediate the water-sharing dispute**.
  - Finally in 1960, an **agreement was reached between the two countries, leading to the signing of the IWT**.
- The IWT delimits the **rights and obligations** of India and Pakistan for the **use of waters on the Indus Rivers**.
- India, Pakistan and World Bank are the signatories of the treaty. Though Indus originates from Tibet, **China has been kept out of the Treaty**.
  - World Bank is the **third-party guarantor**.
- Sharing of water**
  - Eastern rivers:** India was allocated to **India for unrestricted use**.
  - Western rivers:** Water of Indus, Jhelum, and Chenab was **allocated largely to Pakistan**.
    - ✓ **India is permitted for certain agricultural uses**, to build 'run of the river' hydropower projects with limited storage (up to 3.6 million acre feet or MAF of water) as per criteria specified in the treaty.
    - ✓ **Pakistan raises objections over such projects built by India**, if they do not comply with the specifications.

#### Three Step Dispute Resolution Mechanism under IWT



Neutral Expert and CoA is **appointed by the World Bank**. However, **it doesn't have the power to decide whether one procedure should take precedence over the other**.

- Pakistan generally objects to Indian **projects for utilisation of water from western rivers**.
- **Example:** Salal dam project, Baglihar Hydropower project, Shahpurkandi dam, Ujh Multipurpose project and Ravi-Beas Link
- **Permanent Indus Commission (PIC):** Commissioners are appointed by both the countries **for cooperation and information exchange** regarding their use of the rivers.
  - The PIC is required to **meet at least once a year**, alternately in India and Pakistan.
- The treaty provides a **3 tier dispute resolution mechanism** of which PIC is the first stage (refer to the infographics).
- **IWT does not have a unilateral exit provision**, and is supposed to remain in force unless both the countries ratify another mutually agreed pact.
- Seen as **one of the most successful international treaties** as it has survived frequent tensions, including conflict and wars.

### Issues with the IWT

- **Dissatisfaction over water apportionment:** Since 80% water is allocated to Pakistan, the treaty is seen as an unfair settlement by India.
- **Ambiguous and room for conflict:** The treaty is extensively technical and the western rivers flow through the conflicted region of Jammu and Kashmir that paves the way for conflict.
  - For example, Frequent objections by Pakistan has led to delaying of Indian projects for decades.
- **Lack of mutual trust:** The structure does not encourage interactions between riparian which is essential for trust building.
  - Pakistan maintains high troop levels around the canals on the eastern front, fearing that India will try to take control of the western rivers.
- **Suboptimal data sharing:** The data sharing of the flow is frequently unfulfilled due to diplomatic tensions.
  - Also, the **quality of shared data is questioned** many times and there is no mechanism for the research community to get access to it.
- **Limited role of the Guarantor:** For example, in the current disputes of KHEP and RHEP the World Bank had to appoint the Neutral Expert and chairman of CoA simultaneously.
  - Such **concurrent appointments may pose practical and legal risks**.
  - However, the **World Bank lacks the power to decide which one should take the precedence**.
- **Lack of adequate environmental safeguards:** Indus Basin is one of the world's most over-stressed aquifers, but the treaty lacks guidelines to address issues related to climate change.
  - Also, the IWT does not provide **mechanisms and provisions to deal with groundwater** in the Indus Basin.

#### Related information

##### Important international principles for water-sharing

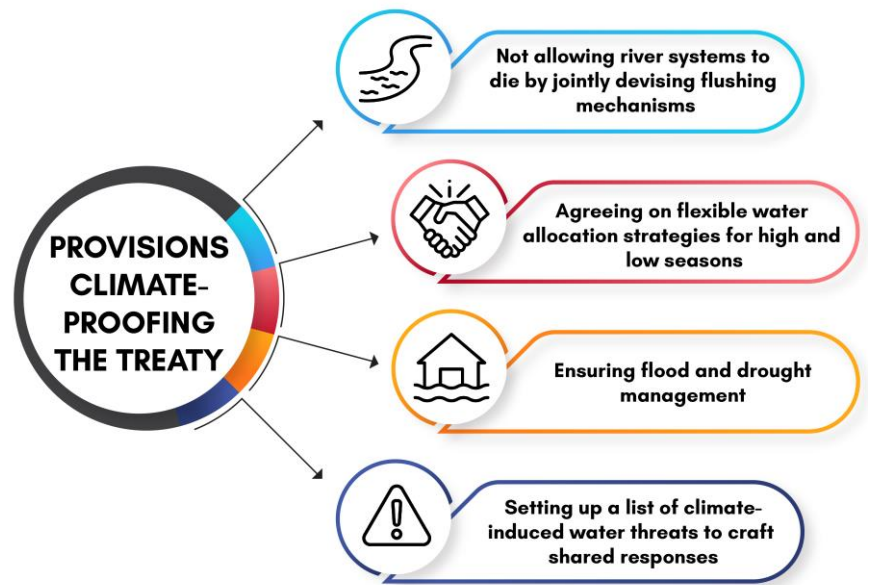
- **The Harmon doctrine:** It postulates that **every state is sovereign** in its water resources and has **right to do whatever it likes** within its territorial jurisdiction.
- **Campione Rules:** It outline the need to include the water of an aquifer (that is, underground water or fossil water) while determining reasonable equitable share.
- **Helsinki rules, 1996:** It established the principle of **"reasonable and equitable utilization"** of the waters of an international drainage basin among the riparian states as the basic principle of international water law.
- **Berlin Rules 2004:** It provides that basin states should manage the water of an international drainage basin having due regard for the obligation not to cause significant harm to other basin states.

### Reforms needed to make IWT more effective

- **Ratification of the UN Water Convention:** The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) is an international legal instrument to **ensure the sustainable use of transboundary water resources** by facilitating cooperation.
  - Initially negotiated as a regional instrument for Europe, it was opened up for accession to all UN Member States in 2016.
- **Global forum on transboundary rivers:** A structurally sound forum for solving water conflicts can **assist in comprehensive policy-making** to ensure the sustainability of transboundary water resources.
- **Promoting open data policy:** There is a need to give free data access to international supervisory bodies and other stakeholders for promoting transparency and applied scientific research.



- This can **ease the tension among the riparian** and divert leaders to evenly focus on the crisis.
- **Optimisation of the treaty:** Since unilateral exit is not possible, India should ensure full utilisation of all accessible water of the rivers. For example,
  - **Repair canal systems** in Punjab and Rajasthan to increase their water carrying capacity.
  - **Expedite new projects** like the one on the **Ujh**, as well as the **Shahpurkandi on the Ravi**.
- **Renegotiate the treaty:** Both the countries should undertake joint research on the rivers to study the impact of climate change for 'future cooperation' (underlined in Article VII of the IWT).



## 2.2. INDIA-AFRICA DEFENCE RELATIONS

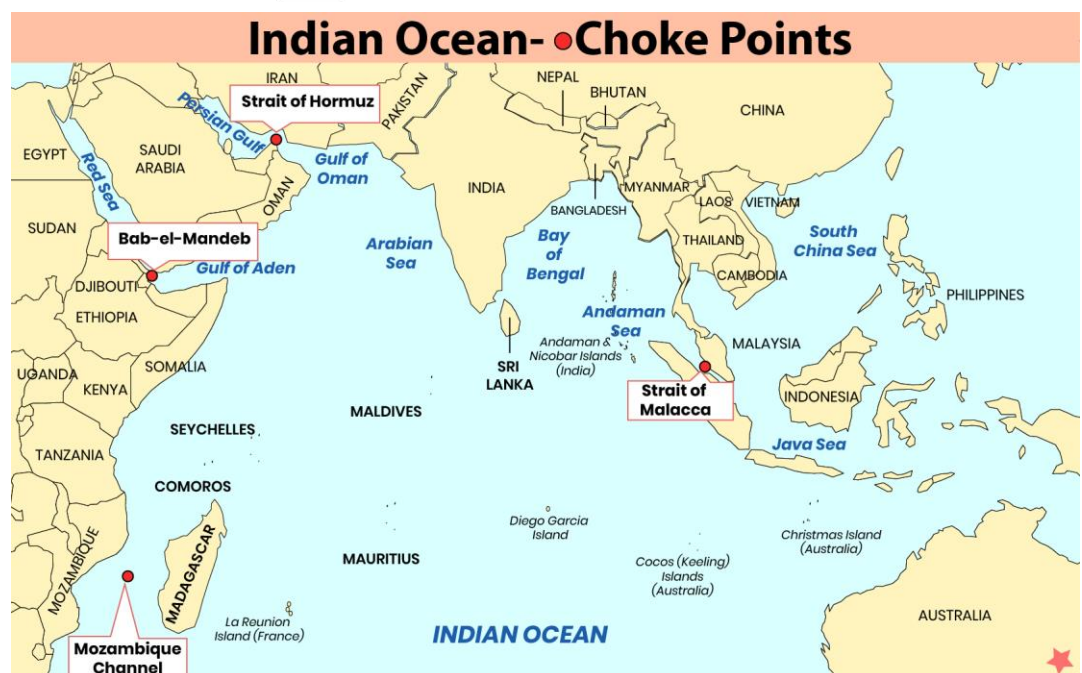
### Why in News?

India-Africa Defence Dialogue (IADD) was held recently on the sidelines of DefExpo 2022 in **Gandhinagar, Gujarat**.

### About India-Africa Defence Dialogue (IADD)

- IADD was institutionalised (in 2020) to be held **biennially** during successive DefExpos.
- **Gandhinagar Declaration was adopted as an outcome document of IADD 2022.**
  - It proposes to **enhance cooperation in the field of training in all areas of mutual interest** by empowerment and capability building of African defence forces, participation in exercises and humanitarian assistance during natural disasters etc.
  - **India offered fellowship for experts from African countries** through Manohar Parrikar Institute for Defence Studies and Analysis.

### OBJECTIVE OF IADD



## Importance of India-Africa Defence Relations

- **Geopolitical:** A constructive defence and security engagement with African countries would provide excellent opportunities to enhance India's influence in this increasingly important region.
- **To Secure African States Interest:** India's Growing presence in the region will help African nations to remain neutral in the intensifying great power rivalries.
  - The great power rivalry between the West on the one hand and Russia and China on the other has emerged as a key feature of Africa's strategic landscape.
- **Maritime Security:** There is a shared concern over the numerous maritime security challenges, especially in Indian Ocean region (IOR), such as piracy, maritime terrorism, Illegal Unreported and Unregulated (IUU) fishing, drug trafficking and human trafficking.
- **Securing Sea-lanes of communications (SLOCs):** It helps to secure vital maritime chokepoints at the entrances to the Indian Ocean like **Bab-el Mandeb, the Gulf of Aden, Strait of Hormuz and the Mozambique Channel.**
- **Fight against terrorism:** Many African countries and India have been victims of terrorism and radical extremism (from Boko Haram, al-Shabaab, Jaish e-Mohammad, al-Qaeda etc.) causing threat to greater economic development and social stability.
- **Counter Chinese influence:** China has made massive inroads in advancing its strategic and economic interests in the IOR, particularly by gaining access to strategic ports and military bases.
- **Boosting Defence exports:** Defence exports grew by 334% in the last five years; India now exporting to over 75 countries and African countries can be a potential market for India's public and private sector organisations.
- **Support to peacekeeping missions:** A strong defence partnership could help peacekeeping forces to grasp the changes that are underway in the nature and role of contemporary peacekeeping operations.

### India's contribution to peace and security in Africa



**Providing training to African defence,** military, naval and civilian personnel in Indian institutes.



**Ensuring maritime security** predominantly through anti-piracy efforts and joint patrolling of the seas.



**Contributing troops and police units** (including women force) to UN peacekeeping operations.

## Challenges in India-Africa Defence Relations

- **Rising China's presence:** China's military-to-military activities in Africa, including Defence Attaché presence, naval ship visits, arms sales etc to support military cooperation will pose a challenge to India's ambitions.
- **Low capital allocation:** While the Indian Navy is now more networked and technology-enabled than it was in the past, it still continues to face budgetary constraints which may negatively impact future planning and development.
- **Interstate and Intra-state conflicts in Africa:** Despite efforts by various stakeholders to establish a peaceful Africa, armed conflicts continue making it difficult to have a defence partnership with relevant stakeholders.
- **Gap between promises and delivery:** Most IOR littorals lack capacity and therefore look towards India to ensure security of their declared maritime zones. However, India has a poor track record in converting capital into deliverables or influence.

### Initiatives taken

- **Africa-India Field Training Exercise 2019 (AFINDEX-19)** to strengthen defence preparedness and security.
- **India-Africa Defence Ministers Conclave (IADMC)** in 2020 that led to the **adoption of the Lucknow Declaration**, which pertains specifically to defence, military, and security cooperation.
  - IADMC provides a concrete platform for Indian and African leaders to conduct sustained discussions at the topmost level.
- **African countries are among the foremost beneficiaries of Indian Navy 's humanitarian assistance and disaster relief (HADR)** operations, non-combatant evacuations and search and rescue operations.
- **India has participated in several UN peacekeeping missions** implemented on the African continent including in the Democratic Republic of the Congo, Mozambique, Somalia, Angola, Rwanda, Sierra Leone, Liberia etc.
- **Bilateral Institutional mechanisms** like the Joint Defence Cooperation Committees and MoUs /Agreements for defence collaboration have been put in place with key countries.

- **Maritime crimes threat:** High incidence of piracy off the East African coast in Gulf of Aden and in the Niger Delta Region and Gulf of Guinea in West Africa, has brought the issue of African maritime security to the world's attention.
- **Identifying areas of mutual benefit:** As new and emerging threats (such as cross-border terrorism, transnational organised crime, illegal immigration etc.) makes it difficult to identify mutual priorities.
- **Lack of synchronisation** between Ministry of Defence and Ministry of External Affairs impacts India's engagement in the region as the resource pool is limited.
- **Growing influence of violent non-state actors,** the impact of extremist ideologies and the threat posed to the multilateral system by rising populism and nationalism.

### Way Forward

- **Develop a Pan-African approach:** It should be in accordance with African needs and priorities.
- **Enhance bilateral engagement:** Enhance levels of military-to-military engagement with leading countries like South Africa, Nigeria, Angola, Ghana and Kenya through institutionalized defence cooperation mechanism including staff talks, as part of strategic level framework.
- **Prioritise security cooperation with Africa:** Security cooperation remains an under- exploited area of the India-Africa strategic partnership.
  - It is **not viewed as a primary driver of the partnership,** especially when considered in relation to trade, investment and development.
- **Timely delivery of projects and requirements.**
- **Explore new areas of cooperation:** There is a need to explore new areas of convergence for defence engagements, including capacity-building, training, cybersecurity, maritime security and counter-terrorism.
- **Increase visibility of Indian defence firms in African markets:** Apart from regular interactions at DefExpo and Aero India, Indian defence firms' visibility in African markets needs to increase substantially.
  - **India should conduct multilateral defence cooperation events** involving select Africa nations, India and US AFRICOM components.

## 2.3. UN PEACEKEEPING MISSION

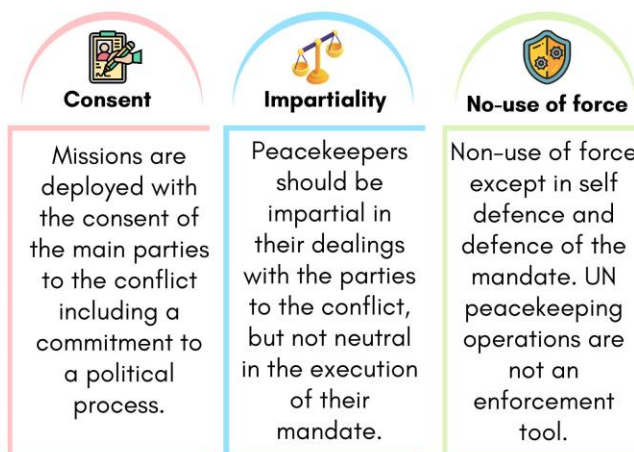
### Why in news?

India has presented **reforms to address security and operational challenges** faced by United Nations peacekeeping missions around the world.

### About UN Peacekeeping mission

- The first UN peacekeeping mission was established in **1948**, when it **deployed military observers to West Asia** to monitor the Armistice Agreement between Israel and its Arab neighbours.
- It aims to build **sustainable security and peace** in countries affected by conflict.
- **Mandates:**
  - **Maintain peace and security:**
    - ✓ Protect civilians and promote human rights
    - ✓ Assist in the disarmament, demobilization and reintegration of former combatants
  - **Facilitate political processes:**
    - ✓ Support constitutional processes and the organization of elections,
    - ✓ Assist in restoring the rule of law and extending legitimate state authority.
- The **decision** to send a peacekeeping mission to a country is made by the **UN Security Council (UNSC)**.
- UN member states **contribute military and police personnel under UN command**, for which they are paid from UN funds.

### Three basic principles of UN Peacekeeping missions





- **Other interested states** may send their own separate armed forces to support the UN mission objectives but are not under UN command.
- Till now there is 71 peacekeeping operations since 1948 and 12 current peacekeeping operation going on.

### Relevance of the mission

- **Absence of alternatives:** There is no other organisation with as much recognition and membership which has stood the test of time.
- **Higher cost benefits ratio:** The mission costs only **0.4% of world military expenditure**, bulk of the peacekeeping missions are in areas, where there are bright chances of conflict arising again.
- **Rise in threats:** Today a **large number of countries are facing asymmetric threats** but do not have adequate resources to fight the same.



### Related information

#### Action for peace (A4P)

- **Action for peace (A4P)** was declared in 2018 as a set of mutually-agreed principles and commitments to **create peacekeeping operations fit for the future**.
- It is centred on **eight priority** commitment areas.
- **A4P+ is the implementing strategy** (with 7 priorities) for A4P for 2021-23

### A4P+ Priorities



### India in Peacekeeping missions

- Currently, India is the **2<sup>nd</sup> highest amongst troop-contributing countries**.
- India's contribution to UN Peacekeeping began with its participation in the **UN operation in Korea in the 1950s**.
- India also served as **Chair of the three international commissions** for supervision and control for Vietnam, Cambodia, and Laos established by the **1954 Geneva Accords on Indochina**.
- In 2007, India became the **first country to deploy an all-women contingent** to the Mission.
- India was also the **first country to contribute to the Trust Fund on sexual exploitation and abuse** set up in 2016.



- So far India has provided **more than 2.5 lakh troops and personnel** for the missions.
- Time and again **India has also pitched for reforms** for the mission to overcome to enhance its relevance in the current circumstances.

### Challenges faced by UN peacekeeping missions

- **Organisational challenges**
  - **Non-inclusive:** Troop and police contributing developing countries do not have a role in the decision-making process.
  - **Financing:** UN peacekeeping missions are facing cash-flow problems and financial strains due to the late payment and withholding of assessed contributions.
  - **Inadequate power with UN secretariat:** UN secretariate cannot take actions against peacekeepers for not protecting civilians from violence or allegations of sexual abuse and rape.
    - ✓ **Military forces deployed** on UN missions are **accountable to their own national commanders and governments.**
    - ✓ While the UN can investigate these allegations, peacekeeper **accountability is up to the country that sends the troops.**
  - **Redundant missions:** Redundant missions are a **drain on UN's depleting resources** and **minimise the efficiency** in other critical peacekeeping operations.
    - ✓ For example, the UN Military Observer Group in India and Pakistan (UNMOGIP) was established in 1949 **to supervise the ceasefire between India and Pakistan.**
    - ✓ However, it has **"outlived its relevance"** after the Shimla Agreement of 1972 and the **establishment of the Line of Control.**
- **Operational challenges**
  - **Waning international support:** The failures of Missions in the 1990's most visibly in Somalia and Rwanda, led to a reduction in the number of missions and a **loss of confidence.**
  - **Rise of regional organisation:** Many times the regional organisations like Organisation of African Unity (OAU) have brokered peace, and the UN has carried out only monitoring roles.
  - **Safety issues:** Safety of peacekeepers are compromised due to rising incidents of:
    - ✓ organized crime,
    - ✓ breakdowns in law and order, and
    - ✓ attacks by extremists.



### Reforms proposed by India for the UN peacekeeping mission

- **Decision making:** Troop and police-contributing countries should have a role in the decision-making process.
- **Clear and realistic mandates:** Peacekeeping missions should be given "clear and realistic mandates" that are matched with adequate resources.
  - The **UNSC needs to avoid terminologies and formulations** while crafting mission mandates that may generate false hopes and expectations.
- **Prudent deployment:** Peacekeeping missions should be "deployed prudently, with full recognition of their limitations.
- **Assessing the mission:** The performance of all mission components, military and civilians, and its leadership should be considered while evaluating a mission.

- **Regional approach:** Support regional and sub-regional organisations in:
  - Mediation
  - Monitoring of ceasefires
  - Assistance in implementing peace accords, and
  - Post-conflict rebuilding
- **Exit strategy:** Peacekeeping missions should factor in an “exit strategy from their very inception”.
- **Cooperation with host:** Establishing trust and smooth coordination between a peacekeeping mission’s leadership and the host state is essential.
- **Safety of peacekeepers:** All-out efforts to bring the perpetrators of crimes against peacekeepers to justice.
- **Security of civilians:** A host government has the primary responsibility to protect civilians from non-state groups across its territory.
- **Technology:** Introduce advanced technology in peacekeeping missions to overcome security challenges.

## Conclusion

International peacekeeping may be regarded as one among the many global public goods. Thus, it is desirable to have a robust regime to govern the issue. Indian interventions are an effort in the direction.

## 2.4. FINANCIAL ACTION TASK FORCE (FATF)

### Why in news?

Financial Action Task Force (FATF) announced the **removal of Pakistan from its “Grey List.”**

### More on news

- Pakistan has been **placed in and removed from “Grey List” in the past too.** It was placed in the “Grey List” for the third time in **June, 2018** and remained there till **October, 2022.**
  - As a result of FATF scrutiny, Pakistan has been **forced to take some action against well-known terrorists**, including those involved in attacks against the entire international community in **Mumbai on 26/11.**
- India highlighted in global interest that **Pakistan must continue to take credible, verifiable, irreversible and sustained action** against terrorism and terrorist financing emanating from territories under its control.

### About Financial Action Task Force (FATF)

- FATF is the global **money laundering (ML) and terrorist financing (TF) watchdog.** The **inter-governmental body** sets **international standards** that aim to prevent these illegal activities.
- **Origin:** It was **established in 1989**, by a **Group of Seven (G-7) Summit** held in Paris.
  - The summit set up the FATF to develop and promote policies, globally, to **help eliminate threat posed by money laundering (ML).**
  - In 2001, the FATF took over responsibility for the development of standards in the **fight against terrorist financing.**
- **Membership:** FATF currently comprises **37 member jurisdictions and 2 regional organisations** (Gulf Co-operation Council and European Commission).
  - **India became a member of the FATF in 2010.**



- **FATF recommendations:** FATF Recommendations are the **international standards** set by the FATF to combat money laundering, terrorist financing, and more recently, **the financing of proliferation (PF)**.
  - PF is the transfer and export of nuclear, chemical or biological weapons, their means of delivery and related materials.
  - It has issued 40 **recommendations to fight money laundering** and 9 special recommendations to **fight terrorist financing (Refer infographic)**.
  - **In 2005** United Nations Security Council urged **all Member States** to implement the **comprehensive, international standards** embodied in the FATF recommendations.

- **FATF Style Regional Bodies:** There are eight **regional bodies** similar to FATF like Asia/Pacific Group on Money Laundering (APG), Eurasian Group (EAG), Caribbean Financial Action Task Force (CFATF) and so on.

### Grey List vs Black List

		Grey List or "Jurisdictions under increased monitoring"	Black List or "High-risk jurisdictions subject to Call for Action"
	<b>Why countries come under these lists?</b>	They have <b>strategic deficiencies</b> in their regimes to counter ML/TF/PF.	They have <b>significant strategic deficiencies</b> in their regimes to counter ML/TF/PF.
	<b>What are the implications of being in these lists?</b>	Countries have to- <ul style="list-style-type: none"> <li>• <b>Formally commit to develop action plans</b> to address strategic deficiencies, in their regimes.</li> <li>• Comply with certain conditions laid down by the FATE, failing which they run the risk of being <b>"blacklisted"</b> by the watchdog.</li> </ul>	Countries have to- <ul style="list-style-type: none"> <li>• Apply enhanced due diligence, and, in most serious cases, countries are called upon to <b>apply counter measures</b>.</li> </ul>

\*ML: Money Laundering; TF: Terror Financing; PF: Proliferation Financing

- **Monitoring compliance:** FATF monitors compliance with these recommendations through a **two-pronged strategy:**
  - Firstly, member countries **complete annual self-assessment** style questionnaire and
  - Secondly, the FATF regularly conducts **on-site Mutual Evaluation Report examinations** on individual jurisdictions, **assessing the effectiveness** of their national policies.
- **FATF's 'Black' and 'Grey' lists-** These terms **do not exist in official FATF terminology** but are colloquial phrases used to describe **two lists of countries maintained** by the body.

### Shortcomings of FATF

- **Weakness in Listing Regime:** As far as **severity of consequences** is concerned, **black list is a quantum jump** over the grey list. The structural weakness in FATF is reflected in the somewhat **simplistic categorisation structure of different jurisdictions** into grey and black.
  - This straightjacketed view **may not permit a flexible and graduated response**.
- **Lack of effectiveness:** FATF relied upon assurances **without actually considering the actual performance**.
  - For instance, in 2015 Pakistan got out of the grey list by **adopting some legal measures** in form but saving its **"strategic assets" in content** (sanctioned under **UNSCR 1267**).
- **Seen as an instrument of power politics:** FATF makes **decisions by consensus**, and no formal rules exist **as to how many members must object to scuttle a proposal or spare a country** from inclusion in grey list.
- **Others**
  - Concerns have also been raised over the **group's informal method of selecting its presidents**.
  - There are no international agreements as to **what constitutes terrorism and terrorist financing** which permits the **existence of havens** for terrorist networks.
  - Countries fail to **enhance mutual legal assistance, information sharing and cooperation** with national sectors and those across borders.
  - **Implementation issues** at the country or private sector level, which leads to the **misapplication of the FATF Standards**.

## Road Ahead

- **Categorisation within grey list:** While moving between the grey and black lists, there may be a **scope for darker shades of grey**.
  - There may be those jurisdictions in the grey list that have the **will to implement** the FATF recommendations but may **lack the necessary technical or administrative capacity**.
  - At the other extreme, jurisdictions **may have the capacity** but would be **unwilling in intent**.
  - After **categorising**, a **graduated response may be designed** in consultation with different constituents like credit rating agencies, banks, IMF and WB, etc.
  - This approach may provide **more flexibility in tackling jurisdictions**.
- **Making FATF more representative:** This can be done by **formalizing the appointment** at various positions and staff within the secretariat through a **transparent and an open competitive system**.
  - Further, steps should be taken to ensure job security and **independence of the secretariat**.
- **Inclusion of new risks:** FATF should **continuously strengthen its standards** to address new risks, such as the **regulation of virtual assets**, which have spread as cryptocurrencies gain popularity.
- **Policy advice and technical assistance:** FATF should provide **substantial technical assistance** to member countries on strengthening **their legal, regulatory, institutional and financial supervisory frameworks**.
  - Such assistance should be outcome of **research/analysis of best international practices**.
  - **Close cooperation and coordination with other key international organizations**, including IMF, World Bank, United Nations, and FATF-style regional bodies can help **FATF to meet its objectives**.

## 2.5. INTERNATIONAL CRIMINAL POLICE ORGANIZATION (INTERPOL)

### Why in news?

INTERPOL has launched the **first ever police metaverse specifically designed for law enforcement agencies** worldwide during its 90th General Assembly in New Delhi.

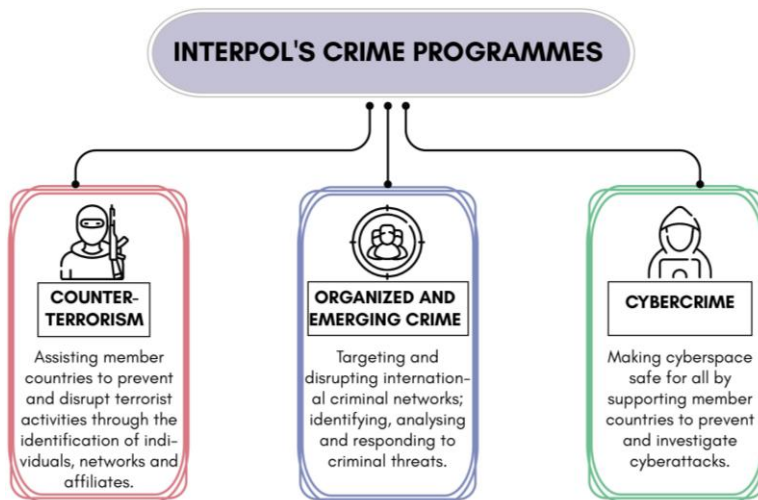
### More on news

- Metaverse refers to **real-time 3D virtual spaces**, where users can meet, create, socialise, work, buy goods and services and attend events with other people who are not in same physical space.
- INTERPOL metaverse **allows registered users to take virtual tour of its general secretariat headquarters in France's Lyon**, interact with other officers via their avatars, and take training courses in forensic investigation and other policing skills.
  - This metaverse, **provided through the Interpol Secure Cloud, assures neutrality**.
  - It can be **accessed by all 195 member countries** and offers benefits like remote work, networking, collecting and preserving evidence from crime scenes, and delivering training.

### About INTERPOL

- It is an **inter-governmental organisation comprising 195 member countries**, which helps police forces in all these countries to better coordinate their actions.
  - It enables member countries to **share and access data on crimes and criminals** and offers a range of technical and operational support.
  - **General secretariat coordinates** organization's day-to-day activities.
  - It is **run by a secretary general with its headquarters in Lyon, France**, with a global complex for innovation in Singapore, and several satellite offices in different regions.

### INTERPOL'S CRIME PROGRAMMES



### National Central Bureau (NCB) in India

- NCB in New Delhi is the sole authorized agency in India for **contacts with the police agencies of the other countries**.
- The **NCB acts as a branch of the Central Bureau of Investigation**.
- It is **under the control of a Deputy Director and two assistant directors**.



- It has a **National Central Bureau (NCB)** in each member country, which is the central point of contact for both the general secretariat and other NCBs around the world.
  - Each NCB is run by police officials of that country, and usually sits in the government ministry responsible for policing. (Ministry of Home Affairs in India)

### Issues associated with Interpol

- **Extradition:** Interpol possesses no influence over its member states and extradition is possible only through bilateral agreements concluded between member states.
  - In addition, ideological issues like political asylum and hospitality for refugees render the extradition task more difficult.
- **Politically- Motivated Arrests:** As per United Nations High Commissioner for Refugees UNHRC, Interpol's role in the arrest of some refugees in 2008 were politically motivated.
  - For example, arrest of Belarusian politician, Ukrainian politician etc.
- **Interpol's Constitution:** Under Article 2, member states are not in any way obliged to comply with the demands of General Secretariat, acting as a hurdle to multinational police cooperation.
- **National Sovereignty:** Member states are completely free to pursue their individual interests while adhering to their laws. This hinders Interpol in carrying out its responsibilities effectively in global system.
- **Corruption:** In 2015, Interpol was criticised for its multimillion-dollar corruption deals with private sector organizations like Federation of International Football Association etc.

### Way forward

- **Possess Powers:** Global organizations should possess the power to make their members obey their decisions and ensure smooth execution of its decisions.

## TYPES OF INTERPOL NOTICES



**RED NOTICE:** To seek the location and arrest of wanted persons with a view to extradition or similar lawful action.



**YELLOW NOTICE:** To help locate missing persons, often minors, or to help identify persons who are unable to identify themselves.



**BLUE NOTICE:** To collect additional information about a person's identity, location or activities in relation to a Crime.



**BLACK NOTICE:** To seek information on unidentified bodies.



**GREEN NOTICE:** To provide warnings and intelligence about persons who have committed criminal offences and are likely to repeat these crimes in other countries.



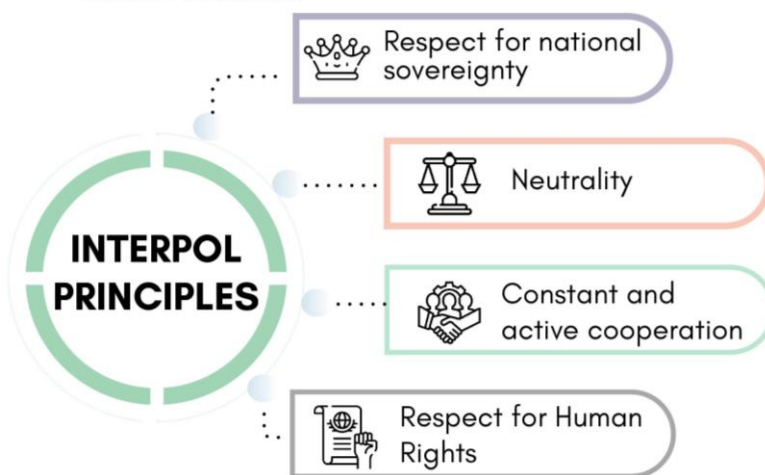
**ORANGE NOTICE:** To warn of an event, a person, an object or a process representing a serious and imminent threat to public safety.



**INTERPOL-UN SECURITY COUNCIL SPECIAL NOTICE:** Issued for groups and individuals who are the targets of UN Security Council sanctions committees.



**PURPLE NOTICE:** To seek or provide information on modus operandi, objects, devices and concealment methods used by criminals.



### Achievements of Interpol

- **ID-ART:** It is a mobile app, launched by Interpol, to identify stolen cultural property, reduce smuggling, and recover stolen works and artefacts.
  - For instance, Police in Romania were able to recover 13th-century Gothic cross that had been stolen.
- **Securing borders:** Checks were made against Interpol's databases to identify people wanted for terrorism, murder, drug trafficking, financial crimes etc.
- **Training:** Police, immigration authorities were provided specialized Interpol training on forensic identification techniques and data sharing mechanisms before carrying out tactical operations in the field.
- **Human Trafficking:** Operations highlighting the importance of carrying out targeted, coordinated enforcement actions against criminals engaged in human trafficking, migrant smuggling etc.
- **Securing Cyberspace:** Multisector partnerships to monitor emerging trends, police the web, and raise public awareness of online risks to build a secure cyberspace.

- **Amending Constitution:** Interpol should amend its Constitution to enable it to adopt an assertive position as a supra-national police force.
- **Police reforms:** Interpol should **sensitize its member states on white collar crimes**, standardize investigation procedures, provide model legislations on money laundering, among others.
- **Red Notice:** Interpol should delete RNs for those who were granted refugee status as per 1951 Refugee Convention issued by their states of origin and establish an independent body to review RNs regularly.
- **Refugee rights:** Interpol should **establish mechanism to protect rights of people with international refugee status** by enlisting asylum and extradition experts, as well as strengthen cooperation with NGOs and UN.

## 2.6. NEWS IN SHORTS

### 2.6.1. NORD STREAM

- The United Nations Environment Programme (UNEP) termed **the leakage of methane gas due to rupture of Nord Stream** natural gas pipeline system as the biggest single release.
- Nord Stream is the **primary network through which gas reaches Germany from Russia** through the Baltic Sea.
  - Nord Stream 1 is a 1,224 km running from Vyborg in Russia to Lubmin in Germany.
  - Nord Stream 2 is 1200-km pipeline Ust-Luga in Russia to Greifswald in Germany.
- **Significance of Nord Stream Pipeline**
  - **Economical and Environment-friendly:** The 1,224 km, \$11-billion underwater link is the shortest, most economical and environment-friendly route to double Russia's gas export to Germany.
  - **Energy security to Europe:** It ensure a highly reliable supply of Russian gas to Europe.
    - ✓ NS2 is particularly important as Europe sees a decline in domestic gas production and an increasing demand for imported gas.
  - **Offers stability in region:** The pipeline offers stability to the strategically important energy trade because Russia's dependence on the European Union and vice-versa are increased.
- Methane greenhouse gas is **80 times more harmful than carbon dioxide** during the 20 years after it is released into the atmosphere.
  - It is responsible for **more than a quarter of the current global warming.**



**SMART QUIZ**

You can scan this QR code to practice the Smart Quiz of International Relations at our open test online platform for testing your understanding and recalling of the concepts.



# 3. ECONOMY

## 3.1. CENTRAL BANK DIGITAL CURRENCY

### Why in news?

Recently, RBI has recently launched a pilot project on **Central Bank Digital Currency (CBDC)** and also issued a Concept Note on CBDC.

### More on news

- The purpose of the concept note is **to create awareness about CBDCs in general and the planned features of the digital Rupee**, in particular.
- It **explains the objectives, choices, benefits and risks of issuing a CBDC in India**, referred to as e₹ (digital Rupee).
- It called for the **amendment of the Reserve Bank of India (RBI) Act, 1934 to include Digital Rupee in the definition of the term “bank note”**.

### Digital Rupee as proposed by Concept note

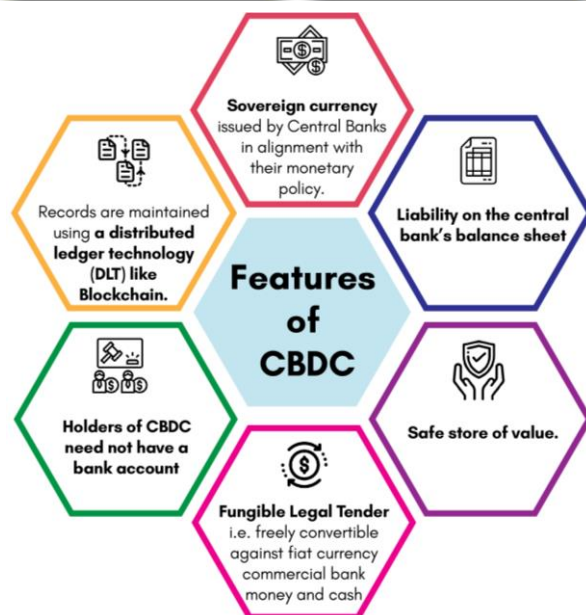
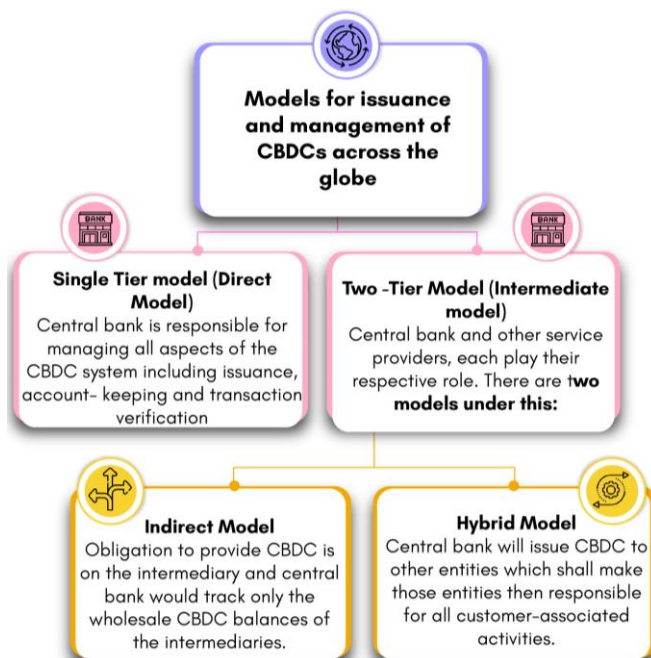
- As per the concept note, the **design of the Digital Rupee will be decided based on the circumstances and need** so that it is combatable with the goals of financial and monetary stability.
- **Accordingly,**
  - **Two forms of CBDCs may be introduced:**
    - ✓ **CBDC-Retail:** potentially available for use by all private sector, non-financial consumers and businesses.
    - ✓ **CBDC-Wholesale:** designed for restricted access by financial institutions.
  - **e-rupee can be structured as ‘token based’ or ‘account-based’.**
    - ✓ **Token-based CBDC is a bearer instrument like banknotes;** whosoever holds the tokens at a given point in time would be presumed to own them.
    - ✓ **Account-based system would require maintenance of record of balances and transactions of all holders of the CBDC.**
  - **Principle of Managed Anonymity** may be followed i.e., “anonymity for small value and traceable for high value,” akin to anonymity associated with physical cash.
  - **CBDC in India would be based on the Two-tier, Indirect model** (see infographic for details)
  - **CBDC would be Non-remunerative** i.e. Non-interest bearing.

### About Central Bank Digital Currency (CBDC)

- RBI defines CBDC as the **legal tender issued by a central bank in a digital form.**
- It is pegged to the value of that country's fiat currency and adds digital form to existing physical form of bank note (**Finance Bill 2022**).

### About the Pilot Project

- **9 prominent banks have been identified for participation** in the pilot project.
  - These are State Bank of India, Bank of Baroda, Union Bank of India, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Yes Bank, IDFC First Bank and HSBC.
- In the pilot phase, RBI will issue the digital currency to each bank's CBDC account at regular intervals **for the settlement of the government securities.**





- Under the **RBI Act (1934)**, RBI has the **sole right to issue bank notes** in India. Only coins, under the Coinage Act (2011) and ₹1 note are issued by central government.

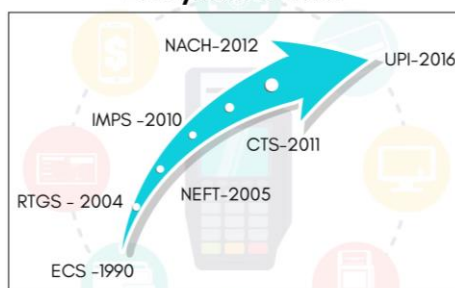
#### Key concepts related to money

- **Money:** Money is a broader term that refers to an intangible system of value that makes the exchange of goods and services possible, now and in the future.
- **Currency:** It is a tangible form of money and is a medium of exchange for goods and services. It's money, in the physical or digital form.
- **Legal tender:** It is a currency that is declared legal by the government and used for payment of the debt. All currency notes, coins and now CBDC are legal tender in India.
- **Fiat currency:** It is a form of currency that is declared a legal tender and therefore includes all type of currency in circulation. It is backed by a country's government instead of a physical commodity like gold or any financial instruments like cheque. therefore has no intrinsic value. It differs from Commodity money, representative money as well as cryptocurrency.
  - **Commodity money** has intrinsic money and is derived from a material like gold or silver.
  - **Representative money** is backed by a physical commodity and issued by the government, like cheques and credit cards.
  - **Cryptocurrency** is free of central authority and backed by blockchain technology.

#### Rationale for introducing CBDC in India

- **Reduction in cost associated with physical cash management:** Significant cost is incurred on printing money in India (more than ₹4900 crore in 2020-21).
  - Apart from this, there is **environmental, social, and governance (ESG) cost** associated with the currency management.
  - CBDC **reduces operational costs** (i.e. costs related to printing, storage, transportation etc.)
- **To further the cause of digitisation to achieve a less cash economy:** CBDC shall further the cause of digital payment, given its ease of usage coupled with sovereign guarantee.
- **Supporting competition, efficiency and innovation in payments:** CBDC could enhance resilience in payments, and diversify the range of payment options.
  - For example, CBDCs can facilitate smooth implementation of smart contracts for direct cash transfer to the farmers in India thereby ensuring transparency
    - ✓ Smart contracts are blockchain based computer protocol for execution of certain actions based on predetermined conditions.
- **To explore the use of CBDC for improvement in cross-border transactions:** CBDCs can make cross border transactions instantaneous and help overcome key challenges relating to time zone, exchange rate differences as well as regulatory requirements across jurisdictions.
- **Support financial inclusion:** Attributes of a CBDC like offline functionality, universal access devices, compatibility across multiple devices etc, shall make financial services more accessible to the unbanked and underbanked population and in remote regions.

#### Evolution of Digital Payments Ecosystem in India



ECS - Electronic Clearing Services;  
 RTGS - Real Time Gross Settlement;  
 NEFT - National Electronic Fund Transfer;  
 IMPS - Immediate Payment Service;  
 CTS - Cheque Truncation System;  
 NACH- National Automated Clearing House;  
 UPI- Unified Payments Interface;

## DID YOU KNOW?



- CBDC is different from the recently launched digital payment instrument e-RUPI.
- e-RUPI is **launched by National Payments Corporation of India (NPCI)** in association with Department of Financial Services (DFS), National Health Authority, Ministry of Health and Family Welfare (MoHFW), and partner banks.
- It is a **one-time digital pre-paid voucher** for **cashless and contactless digital payment**.

### DIGITAL PAYMENT SOLUTION



e-RUPI is a person and purpose-specific digital payment solution

QR code or SMS string-based e-Voucher, delivered to beneficiaries mobiles

Users can redeem voucher without card, payments app or internet banking access

#### CBDC's Global scenario

As per **Bank for International Settlements (BIS) survey**,

- **90% of central banks are engaged** in some form of CBDC work.
- Some countries have launched a CBDC; first was the **Bahamian Sand Dollar in 2020** and the latest was **Jamaica's JAM-DEX**.
  - Many other countries, including major economies like China and South Korea, are in the pilot stage and preparing for possible launches.
  - China aims for widespread domestic use of the e-CNY by 2023.



- **Safeguard the trust of the common man in the national currency vis-à-vis proliferation of crypto assets:** The unabated use of crypto assets can be a threat to the monetary policy objectives as it may lead to creation of a parallel economy.
  - Also, the volatility of cryptocurrency makes it an unreliable payment option with potential to be misused by non-state actors.
  - CBDC could **fulfil demand for secured and stable digital currency as it is backed by the central bank.**

**What CBDC is not?**

- **CBDC is not Mobile Money:** CBDC is different from the all other existing digital payment systems like UPI and other payment wallets, card payments and electronic fund transfers.

Mobile money	CBDC
<ul style="list-style-type: none"> <li>• It is only a type of payment transaction.</li> </ul>	<ul style="list-style-type: none"> <li>• It is a new payment instrument.</li> </ul>
<ul style="list-style-type: none"> <li>• It is the liability of commercial banks and other authorized financial institutions.</li> </ul>	<ul style="list-style-type: none"> <li>• It is the direct liability of the central bank as it is the primary issuer of the currency.</li> </ul>
<ul style="list-style-type: none"> <li>• Mobile wallets are subject to Know Your Customer (KYC) age limitations, where some age groups are restricted from creating wallets.</li> </ul>	<ul style="list-style-type: none"> <li>• CBDC are created to be universally accessible nationally.</li> </ul>
<ul style="list-style-type: none"> <li>• Mobile money requires the presence of intermediary issuing and acquiring banks, financial institutions, or Payment Service Providers (PSPs) to authorize and validate the payments.</li> </ul>	<ul style="list-style-type: none"> <li>• It is a peer-to-peer payment mechanism between senders and receivers and eliminates the need for interbank settlement.</li> </ul>

**What a CBDC is not?**

CBDC is a digital or virtual currency but it is **not comparable to the private cryptocurrencies** that have mushroomed over the last decade.

**Central Bank Digital Currency (CBDC)**

**Characteristics:**

- ★ Central Authority
- ★ Less Volatile
- ★ Flexible Supply
- ★ Lower Privacy & Anonymity

**Examples:**

- ★ E-Naira (Nigeria)
- ★ Digital Yuan (China)\*

**Private Cryptocurrencies**

**Characteristics:**

- ★ Decentralized
- ★ Highly Volatile
- ★ Limited (Incremental) Supply
- ★ Higher Privacy & Anonymity

**Examples:**

- ★ Bitcoin
- ★ Ethereum

Blockchain Technology

### Potential Challenges in adopting digital currencies in India

- **Cyber hacks and threats:** CBDC ecosystems may be at similar risk for cyber-attacks as the current payment systems are exposed to.
  - Further, with **lower financial literacy levels, the increase in digital payment related frauds** may also spread to CBDCs.
- **Threat to privacy:** Anonymity is one of the key traits of cash, and the rise of digital payments threatens the lawful or legitimate preference for anonymity as they leave digital trails.
- **Impact on monetary policy:** The high adoption of CBDC within a country's financial system could create **unnecessary instability** in the economy without proper measures.
- **Technology preparedness: Lower level of technology adoption** may limit the reach of CBDCs and add to existing inequalities in terms of accessing financial products and services.
  - Also, a large elderly educated population is not comfortable with digital banking.
- **Impact on bank credit availability:** With popularity of CBDCs, people may begin withdrawing money from their bank accounts.
  - With reduced disintermediation of banks, their ability for credit creation gets constrained leading to an increase in cost of credit.
- **Currency Substitution through cross-border transactions:** Without proper international collaboration and common framework (or standards), the ability of policymakers to track cross-border flows will be limited.

### Way ahead



- **Robust Regulatory Framework** before adopting this technology and keeping it flexible to incorporate dynamic learning in design of CBDC.

- **Protecting Financial Markets** by addressing the implications of CBDC and other growing digital assets with focus on consumers, investors, and business interests.
- **Ensuring high standards of cybersecurity** and parallel efforts on **financial literacy** is essential for dealing with CBDC.
- **Ensuring compliance to AML/CFT:** A CBDC payment system would need to be compliant with **Anti-Money Laundering/Combating the Financing of Terrorism** (AML and CFT) regulations and requirements.
- **Assuring privacy:** It will be essential to consider the way the privacy is respected, and the data is protected in a CBDC system.
- **Following BIS Principles:** Design choices must be finalised keeping in mind the **foundational principles issued by the Bank for International Settlements (BIS)** to be considered by central banks while issuing a CBDC.

**BIS Principles**

	<b>Do no harm principle</b>	CBDC should not interfere with public policy objectives or prevent banks from performing their monetary stability mandate.
	<b>Coexistence principle</b>	CBDC should be used alongside and complement existing forms of money.
	<b>Innovation and efficiency principle</b>	CBDC should promote innovation and competition to increase the overall efficiency and accessibility of the payment system.

To know more about **Cryptocurrency**, please refer to our following Weekly Focus Document.

 <p><b>Cryptocurrency: A tool of Economic Empowerment or a Regulatory Nightmare?</b></p>	<p>Cryptocurrency is having its best year yet in 2021; becoming more popular, mainstream, and accessible. But, is there a future for cryptocurrency in India? In what form cryptocurrency would be acceptable to Indian lawmakers and regulators remains to be seen. Discussing the basics of cryptocurrency, the document puts light on their role in economic empowerment of the masses and the path ahead to overcome the emerging regulatory challenges due to their increased usage.</p>	
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**3.2. INTERNATIONALIZATION OF RUPEE**

**Why in News?**

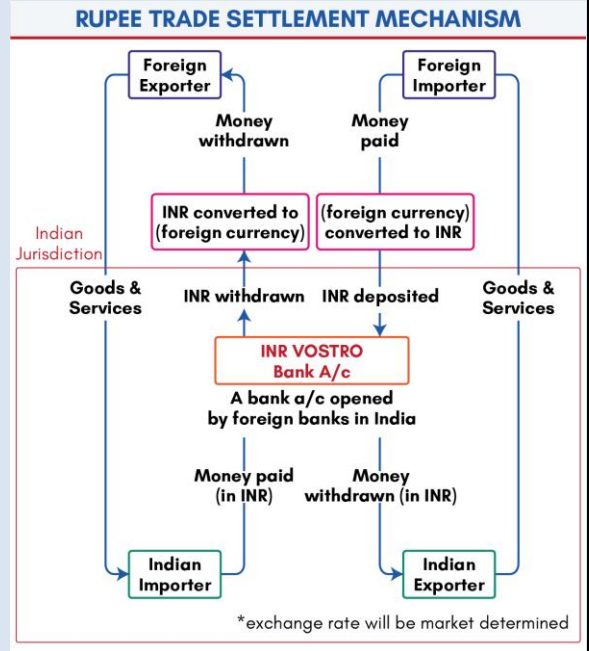
Recently, the central government has made changes to the Foreign Trade Policy (FTP) to allow for **rupee settlement of international trade for export promotion schemes**.

**More about news**

- The changes imply that the **incentives and fulfilment of export obligation** under the FTP **can be extended to export payments made in Indian rupees**.
- These changes have been notified for **imports, exports, export performance for recognition as Status Holders, advance authorization** scheme and **Duty-Free Import Authorization** schemes, and **export promotion capital goods** scheme.
- Government has highlighted that this was done in the light of **rising interest in internationalization of Indian Rupee**.

### RBI guidelines on International Trade Settlement (ITS) in Indian Rupees

- **Exports and imports** under invoicing arrangement may be denominated and invoiced in Rupee, while **exchange rate** between currencies of two trading partner countries may be market determined.
- Exporters and importers can now use a **Special Vostro Accounts** linked to correspondent bank of partner country for receipts and payments denominated in rupees subject to **Foreign Exchange Management Act, 1999**.
- Also, bank guarantee, setting-off export receivables, advance against exports, use of surplus balance, approval process, documentation, etc., related aspects would be covered under FEMA rules.



### About International Currency and Internationalization of Rupee

- The **Tarapore Committee on Fuller Capital Account Convertibility (CFAC)** defined international currency as 'a currency that is widely used for international transactions'.
- An international currency is supposed to perform **three international functions** (see table).

International functions of money		
	For Governments	For Private Sectors
<b>Store of Value</b>	International Reserves	Currency Substitution
<b>Medium of Exchange</b>	Vehicle Currency for Foreign Exchange Intervention	Invoicing trade and financial transactions
<b>Unit of Account</b>	Anchor for pegging local currency	Denominating trade and financial transactions

- E.g. today, the **US dollar** is the **most widely accepted currency** for international transactions, followed by **Euro**. The share of the dollar, as an invoicing currency, is **3.1 times** of USA share in world exports and **4.7 times** of its world imports.
- In the early 1960s, even rupee was accepted as legal tender in **Qatar, UAE, Kuwait, Bahrain, Oman and Malaysia**. But, today, almost **86% of India's imports** as well as **86% of the exports** are invoiced in dollars.

- **Internationalization of a currency** (rupee here) is a process to increase **rupee acceptance (credibility)** across the world through activities as given in image.
- It can also be referred to **adopting full capital account convertibility**, i.e., freedom to convert local **financial assets** into foreign financial assets and vice versa.

### Activities encouraging internationalization of Rupee



- Currently, India allows **partial Capital Account Convertibility** and **full current account convertibility**.
- **Current Account Convertibility** is the freedom or ability to **convert domestic currency** into any foreign currency and vice-versa.

### Initiatives toward Internationalization of Rupee

- In India, the broad framework for cross-border transactions is governed by the **Foreign Exchange Management Act (FEMA), 1999**.



- FEMA replaced the **Foreign Exchange Regulation Act, 1973** to shift India's approach from that of **conservation to management of foreign exchange**; helping in significant growth of **India's exports and capital flows**.

- Further, to **strengthen India's role** as an international financial centre, the government and RBI has taken a number of initiatives towards **internationalization of Rupee** (see image).

### Benefits of Internationalization of Rupee

- **Reduced Foreign Exchange Reserves requirement** for balance of payment stability due to reduced dependence on foreign currency for trade. It can also reduce the **imposed cost** of forex on the economy by **Interest Rate Differential (IRD)**.

- **IRD is the change in interest rates between the currencies of two countries.**

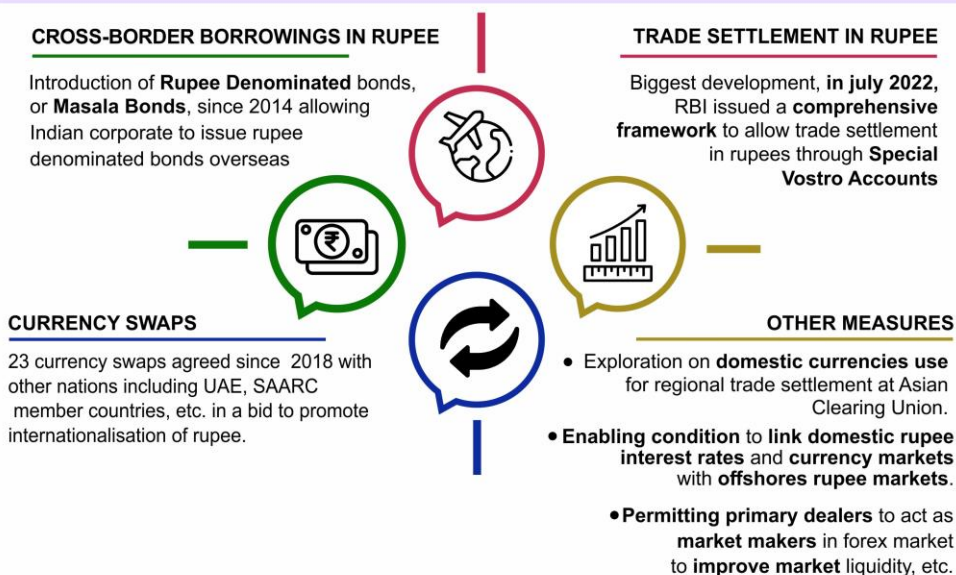
- **Reduced Vulnerability to External Shocks** because of reduced dependence on foreign currency.
- **Mitigates Currency Risks** for Indian Enterprises by eliminating foreign exchange fluctuation, reducing the cost of doing business and support global growth of Indian businesses.
- **Enhance India's global stature and respect**, helping Indian Businesses through increased **bargaining power**.

- E.g., **Post-2008 recession**, Chinese efforts to internationalize Renminbi helped in increasing its global stature.

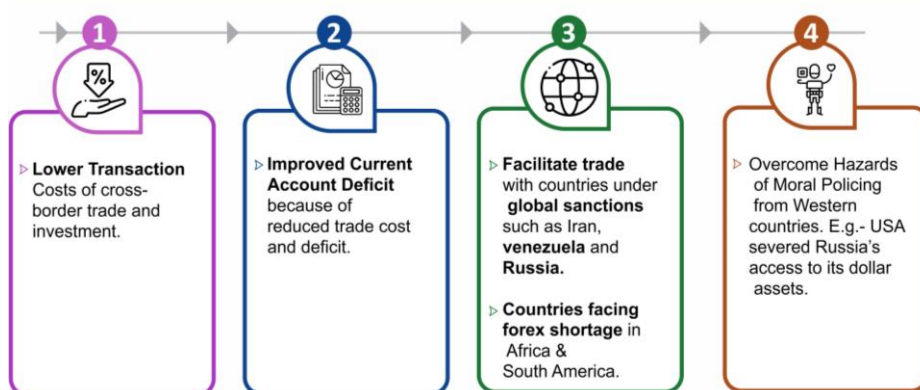
### Challenges in Internationalization of Rupee

- **May complicate Domestic Monetary Policy** by limiting its effectiveness and independence, i.e., RBI's ability to control domestic money supply and influence interest rates as per domestic macroeconomic conditions.
  - It gives rise to the **impossible trinity (Trilemma)** of an open economy, meaning **no country can simultaneously reach the policy goals of free capital movement, exchange rate stability, and independent monetary policy**.
- **Increased Refinancing Risk** by aggravating the pass-through risks of external stimulus to domestic financial markets from non-resident holdings of rupee.
  - For instance, during a phase of global recession, the non-residents can convert their rupee holdings and move out.
- **Heightened Exchange Rate Volatility** (value of rupee) in case inflation rate is higher than the global rate or from uncontrolled flow of capital.
  - It goes against the **prerequisite of price stability** before the internationalization of a currency as **inflation higher than global rate** undermines the use of a currency as an international medium of exchange and a store of value.
- **Increased Responsibility** to maintain international financial and monetary system order, i.e., increased burden to play the role of **'Lender of Last Resort'**.

## Initiatives for Internationalization of Rupee



## Other Benefits





## Way Forward

Internationalization of Rupee has significant benefits but to achieve it successfully, would require some pre-requisites-

- **Developing a deep domestic financial market and its Infrastructure**, including efficient markets for funding and risk transfer, a precondition to effectively absorb external shocks.
- **Effective Management of Capital Inflows (volume and composition)** through the right combination of policies, macro-prudential regulations, market interventions etc.
  - E.g., In the capital flows hierarchy, the **foreign direct investment** is the least risky, followed by **equity investment**, followed by **debt capital**. So, the first focus of policies and macro-prudential regulations should be debt flows.
- **Increasing Rupee Acceptance** as currency for reserves, i.e., currency in which assets are held. E.g., over **\$7.5 trillion** of US treasury securities are held by various nations in August 2022.
- **Increase India's Share in Global Merchandise and Commercial Services Trade**, helping the rupee to gain acceptance as **currency of trade**.

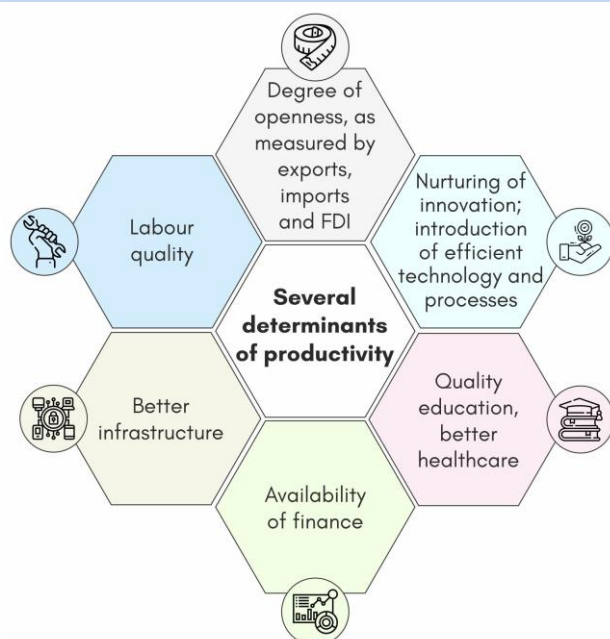
## 3.3. PRODUCTIVITY CHALLENGE OF INDIA

### Why in News?

Indian Productivity Report was released by **RBI and Centre for Development Economics**.

### About Productivity

- Productivity may be defined as the **ratio of the output of goods and services to the inputs** - human as well as others - used in the production process.
  - In other words, it **measures how efficiently production inputs**, such as labour and capital, are being **used in an economy to produce a given level of output**.
- **Different types of productivity measures are:**



<b>Labor Productivity</b>	<ul style="list-style-type: none"> <li>• It is defined as the ratio of output to number of workers or number of hours worked.</li> <li>• With GDP as the measure of output and number of workers as the measure of input, labour productivity is closely related to GDP per capita, which is a measure of the standard of living in a country.</li> </ul>
<b>Total Factor Productivity (TFP)</b>	<ul style="list-style-type: none"> <li>• It is a measure of total output divided by a weighted average of inputs; i.e., labour and capital. Improvements in TFP bring down production costs, raise output levels, and lead to a higher GDP.</li> <li>• Also, TFP growth is often associated with innovation and technological progress, the long-run drivers of per capita income growth.</li> </ul> <div data-bbox="738 1430 1477 1948" style="text-align: center;"> <h3>TFP GROWTH RATE FOR INDIA</h3> <p>TFP growth rate for India for the period 2010-2019 was approx. 2.2%, better than emerging market and developing economies.</p> <p>EMDE: Emerging markets and developing economies *2022 numbers are projections.</p> </div>

## Significance of Productivity

- **Drives economic growth:** A highly productive economy means that it is able to produce more goods or services with the same amount of resource or produce the same level of goods and services with less resources.
- **Increased productivity effects everyone:** For businesses (brings higher profit and opportunity for more investment), For workers (translate to higher wages and better working conditions), For government (higher tax revenues).
- **Improved competitiveness and trade performance:** A swift, substantial augmentation of productivity would enable India's production units to penetrate in a much bigger way into the global export markets.
- **Better policy formulation:** Analysis of changes in factor inputs and productivity at the industry level is essential in identifying India's growth path to facilitate a pro-growth structural transformation.
- **To participate in global value chain:** Increased productivity would help better position India in the global value chain and fend off the intense competition from imports which displaces domestic producers
- **Achieving SDGs:** Strengthening productivity is particularly important in view of 2030 Agenda for Sustainable Development as it will help to end poverty (Goal 1), End Hunger (Goal 2), reduce inequality (Goal 10) etc.

## Reasons for Low productivity in India

- **Lack of skilled workforce:** In 2020, Indian companies had identified skill gaps as their greatest barrier, representing 34% of the challenges they experienced.
  - In 2022, this has risen to 60%.
- **Large unorganised sector and small size of firms:** This creates several hurdles to productivity as enterprises are unable to invest in the machinery due to a lack of access to capital.
  - They are also unable to invest in worker skilling.
- **Innovation limited to frontier firms:** Majority of small enterprises face challenges related to the introduction, use and spread of labour productivity-boosting innovation, lack of automation, outdated manufacturing processes etc.
- **Availability of Data:** Constraints on data for inputs and output at the detailed industry level made it difficult to produce a fair analysis of factor inputs and productivity in other sectors of the economy.
- **Lack of adoption of good management practices:** a high proportion of India's firms score poorly on basic management practices such as in the monitoring of performance, the setting of targets and people management.



## Way Forward

- **Lowering barriers to trade and investment:** Barriers to international trade and foreign investment can be detrimental to productivity growth as economies with lower barriers, and greater integration into supply chains, have experienced higher growth.
- **Encourage growth of firm size:** larger firms are typically more productive than smaller firms (reflected in higher wages paid by larger firms).
- **Improve quality of training:** Improve the access of quality and relevant training for all including marginalized section particularly in the rural areas to raise productivity and income.

### Initiatives taken for improving Productivity

- **Various flagship programmes** such as Skill India Mission, Make in India, Digital India, Smart City Mission, Atal Mission for Rejuvenation and Urban Transformation, Housing for All, Infrastructure Development and Industrial Corridors are **oriented towards improving productivity, generating employment opportunities and economic growth.**
- **Focus on infrastructure development** such as National Infrastructure Pipeline, PM GatiShakti, Dedicated Freight corridors etc.
- **Technological interventions** for processing, product development, sustainability, and export orientation in agriculture sector.

- It will also to **link opportunities for better livelihood and employment.**
- **Investing in ICT:** It can have a positive impact on growth as ICT equipments enable new organizational models and other innovations in the production process as well as the production of new goods and services.
- **Fostering productivity in industry, particularly manufacturing sector:** through initiatives like trade reforms; skills-upgrading programmes; infrastructure upgradation, improving accessibility to ICT, encouraging FDI and innovation.
- **Reforming education for innovation and productivity:** For workers to be able to use new technology and capital productively, education and training systems need to be adapted to provide new skills, competencies and abilities.

### 3.4. OPEN NETWORK FOR DIGITAL COMMERCE (ONDC)

#### Why in news?

ONDC network recently started beta testing with consumers in Bengaluru.

#### What is Open Network for Digital Commerce (ONDC)?

- ONDC is an **initiative of the Department of Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce.**
- It was incorporated as a **Section 8 (Non-Profit Organisation under Companies Act 2013) company** in December 2021.
  - The Quality Council of India and Protean eGov Technologies Limited are its initial promoters.
- It aims at promoting **open networks for all aspects of exchange of goods and services** over digital or electronic networks.
- **ONDC started its Alpha test phase with a closed user group of buyers first in Bengaluru in April 2022** expanding to more than 80 cities by September 2022. This validated the apps and confirmed business and operational flows.
  - Now in beta testing phase, general public can experience shopping via ONDC and provide early feedback for necessary action if any before expanding further.

#### Related news

- **Shiprocket** became the first inter-city logistics provider to plug into the ONDC network.
- **Other Network Participants of ONDC:**
  - **Buyer side:** Paytm Mall, Kotak, IDFC, GOFRUGAL, Craftsvilla, PhonePe, etc.
  - **Seller Side:** Zoho, Snapdeal, etc.
  - **Logistics providers:** LoadShare, Dunzo, Ekart, etc.
  - **First multinational company to join ONDC:** Microsoft.



#### WHAT IS ONDC?

- Market and Community-led initiative
- An open network
- Eliminates the need for a central intermediary
- An enabler for massive digital commerce expansion
- An enabler for broad-based innovation

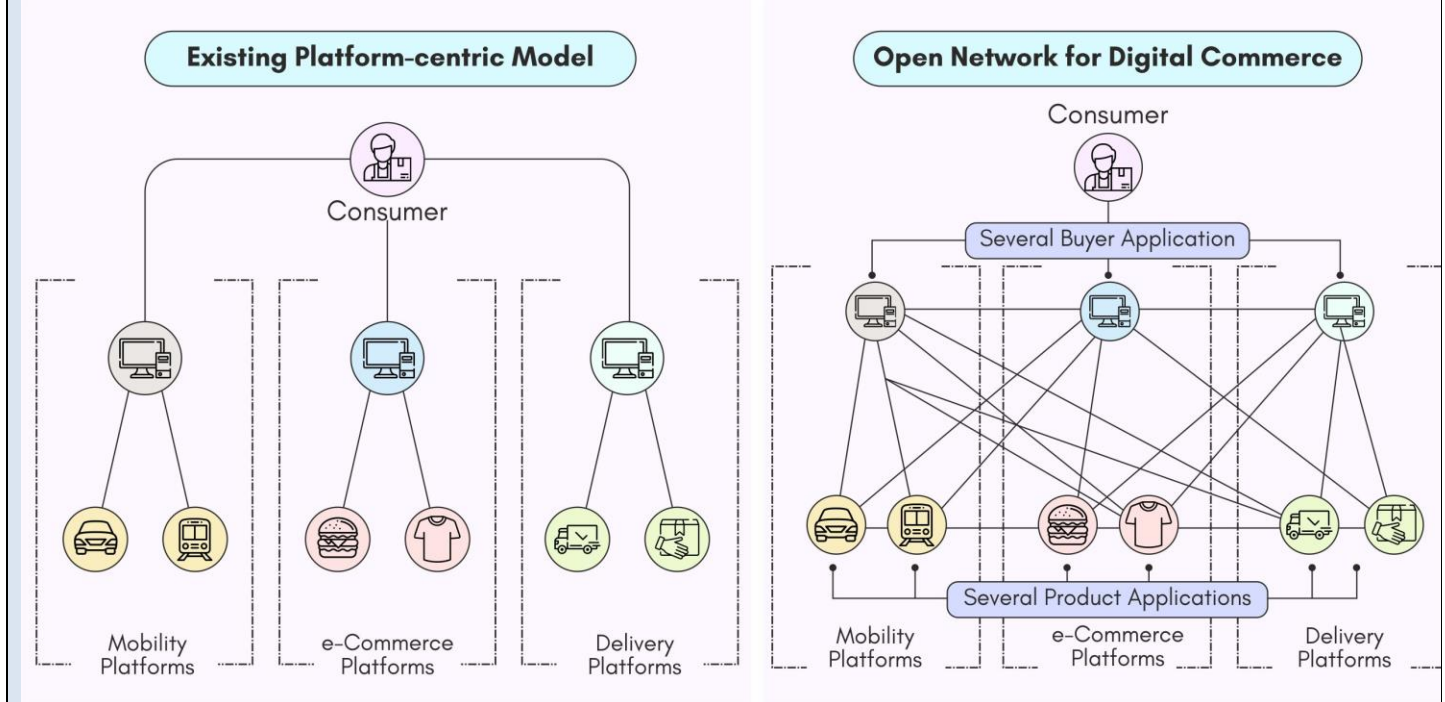


#### WHAT IS ONDC NOT?

- A Government Regulatory Body
- An application or a platform
- A central intermediary
- A medium to help digitize businesses

## How is ONDC different from traditional e-commerce models?

Unlike traditional paradigm of e-commerce, ONDC is not dependent on any specific platform and technology. It is an open network of platforms/applications which are interoperable, as a result of which operational control is decentralised.



## Significance of ONDC in India

- **Ending monopolistic tendencies:** ONDC will lower entry barriers for local businesses and create a level playing field for the e-commerce landscape, currently dominated by players like Amazon and Flipkart.
- **Enhancement of value for consumers:** Consumers can potentially discover any seller, product or service by using any compatible application or platform. This will increase freedom of choice for consumers.
  - It can **bridge the huge disconnect between the scale of online demand and the ability of the local retail ecosystem** to participate.
  - **India has the third-largest online shopper base globally**, with 14 crore e-retail shoppers in 2020, only behind China and the US.
  - This number is expected to grow significantly with the addition of 37 crore tech-savvy consumers by 2030.
- **Moving away from an operator-driven platform-centric model:** Consolidating most of the trade of digital commerce in one platform creates concentration risk. It can also lead to exclusion and discretionary behaviour, limiting the choice and freedom of the buyers and sellers.
  - ONDC resolves these issues by creating a facilitator-driven interoperable decentralised network for e-commerce.





- **Formalizing local businesses:** Around 1.2 crore hyperlocal merchants (Kirana) account for 80% of the retail sector in India, with 90% of them being unorganized, or self-organized.
  - ONDCs can help in their formalization by creating active digital history and enabling easier access to finance options.
- **Growth and Development: ONDC will enable economic development and livelihood creation opportunities** across the digital commerce value chain i.e., logistics, packaging, last-mile delivery, etc.
- **Encouraging widespread participation of small and medium enterprises:** ONDC can help lower entry barriers for Micro, Small and Medium Enterprises (MSMEs) that have the potential to flourish with innovative sales and marketing efforts.
- **Other potential benefits:** Enhanced supply chain efficiencies; amplifying geographic and socio-economic coverage of digital commerce landscape; Standardization of operations; enhanced transparency in pricing; greater innovation through open network etc.

#### Potential challenges in implementing ONDC

- **Grievance redressal:** Decentralized system can lead to lack of clarity over who shoulders the responsibility for customer service and redressal in case of grievances.
- **Difficulties in ensuring compatibility and interoperability** of the existing platforms/applications of the buyers and seller.
- **Limited technical capability** of local businesses and MSMEs to be onboarded on the digital network.
- **Privacy and security concerns:** Such open network may lead to collection of personal data which may have privacy issues and its open nature may expose it to hackers.
- **Competition from big players:** Local business will find it extremely challenging to compete with the discounts, sales and other lucrative offers, being offered by prominent e-commerce players.

#### Way Forward

- **Provide technical support** to small and local businesses to use and design a technical tool, compatible with ONDC protocol for their digital onboarding.
- **Minimal personal data collection:** Data exchange protocols should be designed to minimize friction. Also, it must be based on clear rules that protect the consumer interest i.e., the platform should be built on “privacy by design” principles.
- **Leverage the strength of India’s Startup ecosystem** to build ONDC based applications.
- **Establishing trust among consumers:** Clear guidelines on grievance redressal need to be established.
  - For the purpose, ONDC is conducting a public consultation on 24 issues pertaining to payments, fulfilment of orders, refunds and cancellations on building trust in the ONDC Network.
- **Encourage niche products and services:** For instance, ONDC can be integrated with One District One Product (ODOP).

## 3.5. NOBEL PRIZES 2022

### Why in News?

The **Nobel Assembly** and the **Royal Swedish Academy of Science** have announced the winners of the **Medicine, Physics and Chemistry Nobel** for the **year 2022**.

### About Nobel Prize

- The Nobel Prize is an **international award** administered by the Nobel Foundation in Stockholm, Sweden, and based on the last will of **Alfred Nobel** (in **1895**).
  - Alfred Nobel, a Swedish inventor, and entrepreneur, is popularly known for inventing **dynamite, blasting cap, and smokeless gunpowder**.
- **Categories:** Instituted in **1901**, the **prize is awarded annually** from the bulk of fortune left by Alfred Nobel in **five categories: Physics, Chemistry, Physiology or Medicine, Literature and Peace** - conferred to people for the **greatest benefit to humankind** in preceding year.

- The **sixth category**, the **Nobel Prize in Economic Sciences**, was instituted in **1968** by the **Royal Bank of Sweden** and was **first awarded** in **1969**.
- **What do the winners receive?:** The recipient of each prize receives three things:
  - A **Nobel diploma**, each of which is a unique work of art;
  - A **Nobel medal**;
  - A **cash prize of 10 million Swedish kronor**. (They have to deliver a lecture to receive the money).
- **Who awards the prizes?:** The Royal Swedish Academy of Sciences awards the **Nobel Prize in Physics, Chemistry and Economics**.
  - The **Nobel Prize in Literature** is awarded by the **Swedish Academy, Stockholm, Sweden**.
  - The **Nobel Assembly at Karolinska Institute, Stockholm, Sweden** awards the **Nobel Prize in Medicine (Physiology)**.
  - The **Norwegian Nobel Committee** is responsible for the selection of eligible candidates and the choice of the **Nobel Peace Prize** laureates.
- **Prize winners are called laureates**, to signify the laurel wreath given to victors of contests in ancient Greece. **More than one, but no more than three, people can win each prize.**
- The Nobel statutes **prohibit the judges from discussing their deliberations for 50 years.**

*Kindly note that, Nobel Prize in Chemistry, Physics and Medicine have been covered under Science and Technology section. Nobel Prize in Literature and Nobel Peace Prize are covered under Culture section.*

### Indian Noble Prize Winners\*

 <b>RABINDRANATH TAGORE</b> Nobel Prize for Literature (1913) For-Profoundly sensitive, fresh and beautiful werve, by which with consummate skill, he has made his peotic journey	 <b>C V RAMAN</b> Nobel Prize for Physics (1930) For-Work onscattering of light and discovery of Raman Effect
 <b>HAR GOBIND KHORANA</b> Nobel Prize In Physiology or Medicine (1968) For-Interpretation of genetic code and function in protein synthesis	 <b>MOTHER TERESA</b> Nobel Peace Prize (1979) For-Work in bringing help to suffering humanity
 <b>SUBRAMANYAN CHANDRASEKHAR</b> Nobel Prize for Physics (1983) For-Studies of Physical processes of importance to structure and evolutionof stars	 <b>AMARTYA SEN</b> Nobel Memorial Prize in Economic Sciences (1998) For-Work Contributions to welfare economics
 <b>VENKATRAMAN RAMANKRISHNAN</b> Nobel Prize in Chemistry (2009) For-Studies of structure and function of ribosome	 <b>KAILASH SATYARTHI</b> Nobel Peace Prize (2014) For-Struggle against the suppresssion of children and young people and for the right of all children to education
 <b>ABHIJIT BANERJEE</b> Nobel Prize in Economic Sciences (2019) For-Experimental approach to alleviating global poverty	<p>* Five of them are Indian citizens and four are of Indian origin. ★</p>

### 3.5.1. NOBEL PRIZE FOR ECONOMICS 2022

#### Why in News?

The Royal Swedish Academy of Sciences has decided to award the **Sveriges Riksbank Prize in Economic Sciences** for **research on banks and financial crises**.

#### More about News

- The prize has been awarded to **3 US-based economists**:
  - **Ben S Bernanke**: Former Chair of the US Federal Reserve and currently associated with the Brookings Institution in Washington DC.
  - **Douglas W Diamond** and **Philip H Dybvig** are professors of banking and finance.
- Their work focused on **understanding the role of banks in the economy** (refer to infographics).
- Their findings are of the **greatest benefit to society** as their insights have **improved our ability to avoid both serious crises and expensive bailouts**.

## About the Research

### Research by Bernanke

- Bernanke analysed the **Great Depression** of the 1930s, the worst economic crisis in modern history.
- Before his study, bank failures were seen as a “consequence” of the financial crisis.
- However, in 1983, he proved **bank runs led** to bank failures that turned a **relatively ordinary recession into a depression**.
  - When **the banks collapsed, valuable information about borrowers was lost** and could not be recreated quickly.
  - Society’s **ability to channel savings to productive investments was thus severely diminished**.
- He demonstrated that the **economy did not start to recover until** the state finally implemented **powerful measures to prevent additional bank panics**.
- **Bernanke** as the head of the US Federal Reserve used his wisdom to **prevent further deterioration of the 2008 financial crisis**.

**Research by Diamond and Dybvig:** They developed theoretical models explaining following:

- **Conflict of saver and investors:**
  - For the economy to function, **savings must be channelled to investments**. However, there is a conflict here between savers and investors (refer infographics).
  - In their theory, Diamond and Dybvig show how **banks offer an optimal solution to this problem**.
    - ✓ By acting as intermediaries that accept deposits from many savers, banks can allow depositors to access their money when they wish, while also offering long-term loans to borrowers.
  - However, their analysis also **showed how the combination of these two activities makes banks vulnerable to rumours** about their imminent collapse.
    - ✓ If a large number of savers simultaneously run to the bank to withdraw their money, the **rumour may become a self-fulfilling prophecy** – a bank run occurs and the bank collapses.
  - These dangerous dynamics can be **prevented through the government providing deposit insurance** and acting as a lender of last resort to banks.
- **Role of banks in the society:** Diamond demonstrated how banks perform another societally important function.
  - As intermediaries between many savers and borrowers, **banks are better suited to assessing borrowers’ creditworthiness** and ensuring that loans are used for good investments.

## SIGNIFICANCE OF THE FINDINGS BY THE 2022 NOBEL LAUREATS IN ECONOMICS

Their research helped us understand



Role of banks in the economy particularly during **financial crises**

How **banking failures** can amplify and self-perpetuate a crisis?



How bank collapses can be avoided?

How financial markets can be regulated?



## FUNDAMENTAL CONFLICT



### Needs of savers'

Savers always want access to at least some part of their savings for unexpected use which is also called the need for liquidity

### Needs of investors'

Investors or borrowers like businesses and home buyers need the money for a much longer time. They cannot function if the money can be demanded back at a short notice.

### Deposit insurance in India

- Deposit insurance in **India** was **launched in 1962**.
- India was the second country in the world to introduce such a scheme after the United States in 1933.
- In India each depositor in a bank is insured **upto a maximum of ₹ 5 Lakhs for both principal and interest amount**.

### About Bank runs

- Bank runs happen when **depositors** become worried about the bank’s survival, and **rush to withdraw their savings**.
- If **enough people do this simultaneously**, the bank’s reserves cannot cover all the withdrawals, and it is **driven to bankruptcy**.
- Due to bank runs, **the recession of 1929 had turned into a full-fledged banking crisis by 1930** as half the banks went bankrupt.



### 3.6. DIGITAL BANKING UNITS (DBUS)

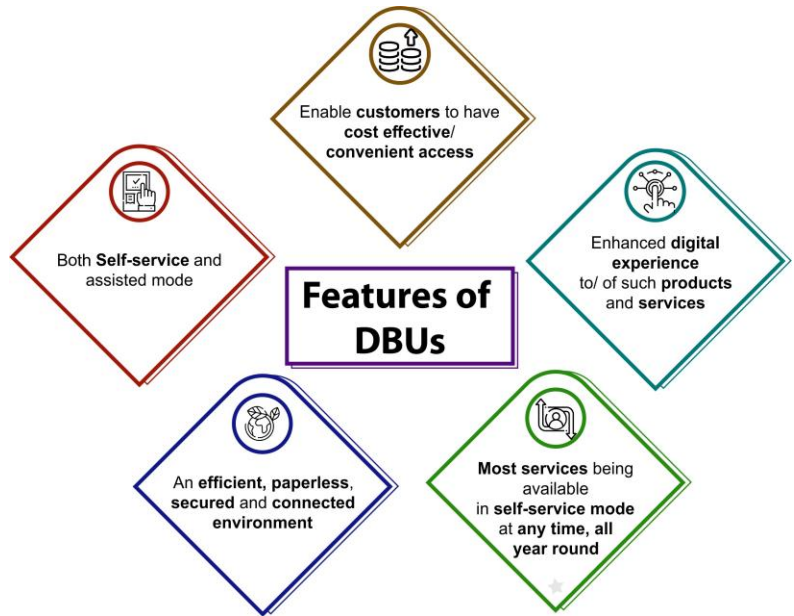
#### Why in News?

The PM dedicated 75 Digital Banking Units (DBUs) as part of efforts to spread the benefits of digital banking to every nook and corner of India.

#### Digital Banking Units (DBUs): Setup and Services

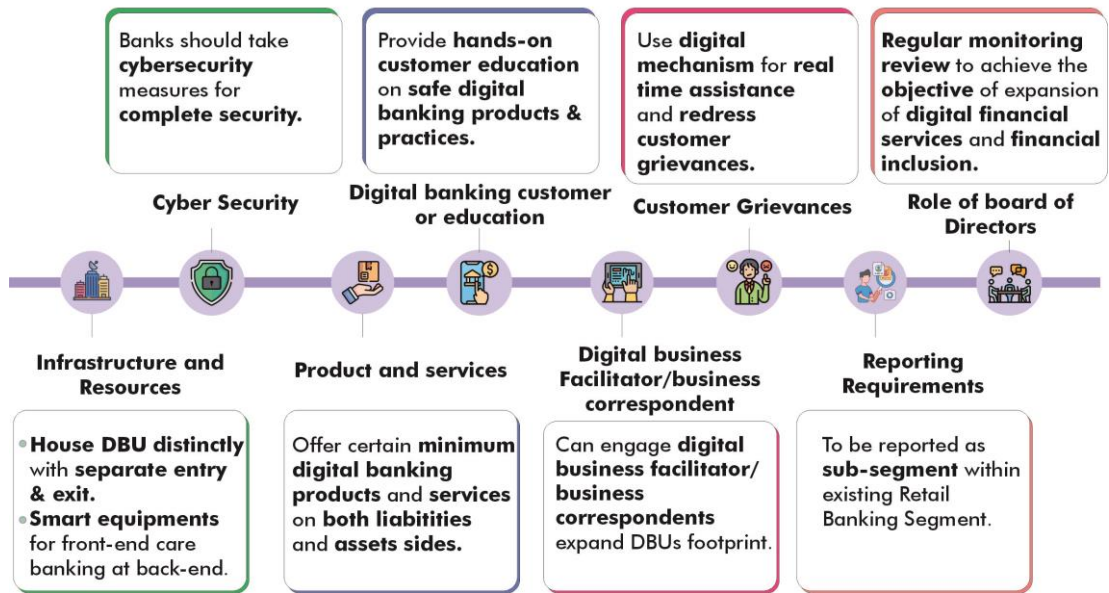
Recently, the Reserve Bank of India (RBI) also issued guidelines on 'Establishment of DBUs'.

- A DBU refers to 'a specialized fixed-point business unit/hub housing certain minimum infrastructure for delivering digital banking products & services as well as servicing existing financial products & services digitally'.
- These are brick-and-mortar banking outlets with digital infrastructure to deliver a variety of banking products and services to people via:
  - **Self-service Zone** where customers can access an ATM, a Cash Deposit Machine, print pass book, access internet banking, pay bills and taxes etc.
  - **Digital Assistance Zone** to assist customers to undertake the services including opening of savings account, current account, etc.



#### Guidelines for DBUs Establishment

- Based on the RBI Guidelines, the 75 DBUs are set as a joint initiative of the Government, the RBI, the Indian Banks Association and the participating banks.
  - DBUs can be set up by all Scheduled Commercial banks (SCBs) (excluding Regional Rural Banks, Payments Banks and Local Area Banks) with past digital banking experience.
    - ✓ E.g. the banks setting the 75 DBUs include 11 public sector banks, 12 private sector banks and one small finance bank.
  - SCBs are permitted to open DBUs in Tier 1 to Tier 6 centers, without the need to seek permission from RBI, unless otherwise specifically restricted.



#### Significance of DBUs

- **Promote Digital financial literacy** by acting as digital financial literacy centers and simplification of banking procedures for increased digital banking adoption.

- It is estimated that **540 million** people in India have never made a digital payment.
- **Improve Financial Inclusion** by taking digital banking to areas which lack connectivity or digital accessibility. For instance, hassle free account opening, easy access to government schemes etc.
  - According to **Global Findex Database 2021**, India is among seven countries which is home to half the world's 1.4 billion adults without access to formal banking.
- **Build a robust and secure banking system** through its special emphasis on cyber security awareness for customers.
  - As per National Crime Records Bureau (NCRB) data, 3,432 cases of credit and debit card frauds were filed across India in **2021**.
- **Strengthening Digital Economy** by pushing banks to **adopt digital strategy**, launch of **new products and services** and foster innovation by collaborating with fintech companies.
  - It can facilitate end-to-end digital processing of **MSME/retail loans** for increased **credit penetration** in the country.
- **Other Benefits of DBUs:**
  - **Reduced operating costs** for banks in the long-run by reducing physical footprint (**Light Banking Approach**);
  - **Improved usability** through 24X7 banking services (e.g. cash deposit & withdrawal).
  - **Greater Personalization** of products and services by using Artificial Intelligence (AI) and Machine Learning (ML) in processing real-time data.
  - **Support Transparency** by reducing circulation of cash in the economy, helping in greater formalization of the economy

#### Limitations of DBUs

- **Low public awareness:** People in semi-urban and rural areas lack financial literacy and internet use due to lower smartphone penetration.
- **Digital Connectivity:** DBUs need stable internet connectivity and power supply to carry out transactions and offer enriched customer experience, a challenge in major part of the country.
- **Higher Cyber Frauds Risk** or threat to privacy because of increased phishing attempts, malware attacks, identity thefts etc.
- **High Initial Cost** for banks in infrastructure set up of DBUs and in development, maintenance and security of hardware and software needed to keep them **simple, efficient and safe**.

#### Way Forward

Digital Banking Units can drastically change the way banks and customers interact with one another. But DBUs cannot operate in isolation. They will have to be accompanied with efforts in the direction of **increasing financial education, improving digital infrastructure** and most importantly, **ensuring that there is trust in the digital banking ecosystem**.

## 3.7. POVERTY AND SHARED PROSPERITY 2022

### Why in news?

The **World Bank (WB)** recently released the 'Poverty and Shared Prosperity 2022' report.

### Key Findings of the report

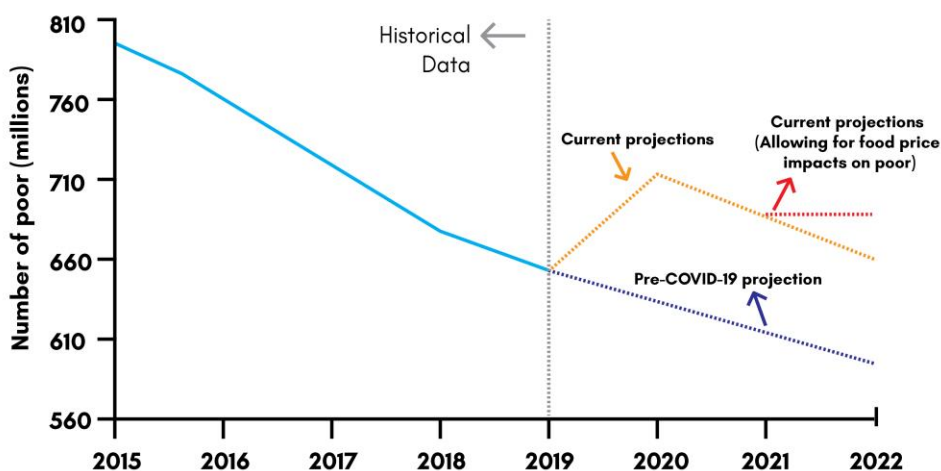
- **Setback to global poverty due to COVID-19 pandemic:** The pandemic increased the global extreme poverty rate to an estimated 9.3% in 2020 (up from 8.4% in 2019).
- **Extent of Poverty:** In 2019 nearly half of the world's population (47%) lived in poverty.
- **2020 marked a historic turning point:**
  - **Global Inequality rose for the first time in decades:** Income losses of the poorest 40% of world's population were twice as high as those of the richest 20%.
  - **Global median income declined** (by 4% percent) **for the first time** since WB's measurements began in 1990.
- **Uneven economic recovery from the COVID-19 pandemic:** The richest economies have recovered from the pandemic at a much faster pace than low- and middle-income economies.

Definitions of Poverty by the World bank (based on consumption level)	
Extreme poverty	Living on less than US\$2.15 a day
Poverty	Living on less than US\$6.85 a day






## India related Findings

- Increase in poverty:** As per the data from the Centre for Monitoring Indian Economy (CMIE), the number of people living in poverty increased by 56 million in 2020.
  - Almost 80% of the total 70 million people globally pushed into poverty during Covid were in India.
- Rate of Poverty decline was less than suggested by earlier estimates:** At the US\$1.90 poverty line, latest estimate shows that poverty was 13.6% in 2017 as against 10.4% predicted earlier.
- Absence of recent data for India** severely limited the measurement of poverty in South Asia.
  - There have been no official estimates of poverty available since 2011 which based on the data of National Sample Survey Organisation (NSSO).
- Notable successes during COVID-19:**
  - India managed to provide food or cash support to 85% of rural households and 69% of urban households, helped by digital cash transfers.
  - Use of Mahatma Gandhi National Rural Employment Guarantee Act to mitigate income losses during COVID-19 reduced job losses by 7% in rural areas over the baseline employment rate.

## Poverty reduction resumed slowly in 2021, but may stall in 2022



## POVERTY ALLEVIATION SCHEMES IN INDIA

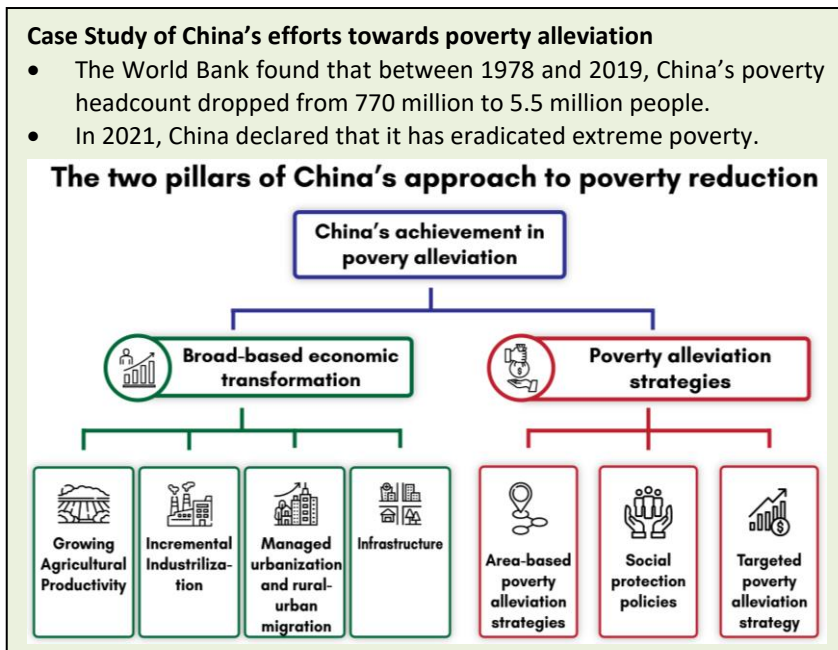
<b>Health and nutrition</b> 	<ul style="list-style-type: none"> <li>Ayushman Bharat (Universal Health Coverage.)</li> <li>Pradhan Mantri Matru Vandana Yojana for Pregnant and Lactating Mothers</li> <li>POSHAN Abhiyaan</li> <li>National Food Security Act, 2013 and Public Distribution System (PDS)</li> </ul>
<b>Employment and livelihood</b> 	<ul style="list-style-type: none"> <li>Deen Dayal Antyodaya Yojana - National Livelihoods Mission (NRLM)</li> <li>Mahatma Gandhi National Rural Employment Guarantee Act (Assured employment for rural households.)</li> <li>Pradhan Mantri Kaushal Vikas Yojana (Skill Certification)</li> </ul>
<b>Social security</b> 	<ul style="list-style-type: none"> <li>Pradhan Mantri Jeevan Jyoti Bima Yojana (lifecover of Rs. 2 lakhs)</li> <li>Pradhan Mantri Suraksha Bima Yojana (risk coverage upto Rs.2 lakhs)</li> <li>Pradhan Mantri Shram Yogi Maandhan Yojana (Social security of Unorganized workers)</li> </ul>
<b>Schemes to overcome impact of COVID-19</b> 	<ul style="list-style-type: none"> <li>Pradhan Mantri Garib Kalyan Yojana Package for food, insurance of health workers, etc.</li> <li>PM CARES for Children Scheme (care of children of orphaned children)</li> <li>PM Street Vendor's Atma Nirbhar Nidhi (SVANidhi) (Micro-Credit facility for street vendors)</li> </ul>
<b>Others:</b> 	<ul style="list-style-type: none"> <li><b>Affordable housing:</b> Pradhan Mantri Awas Yojana (PMAY) (housing for all by 2022)</li> <li><b>Affordable cooking fuel:</b> Pradhan Mantri Ujjwala Yojana (PMUY) (subsidized clean cooking fuel to deprived households)</li> </ul>

## Way forward: Recommendations of the report

- Reorient spending away from subsidies toward support targeted to poor and vulnerable groups:** For example, programs like targeted cash transfers are far more likely to reach poor and vulnerable groups.
- Increase public investment that supports long-run development** such as investments in the human capital of young people or investments in infrastructure and research and development.



- **Reforming fiscal policy:** Successful fiscal reform to restore pandemic related losses will require the support of sufficiently powerful domestic coalitions as well as stepped-up global cooperation.
- **Mobilizing revenue without hurting the poor:** This can be accomplished through property and carbon taxes and by making personal and corporate income taxes more progressive.



Poverty Estimation studies in India	
<b>Tendulkar Committee, 2009</b>	<ul style="list-style-type: none"> <li>• <b>Methodology:</b> Based on <b>Monthly Per Capita Consumption Expenditure (MPCE)</b> computed on the basis of data from the National Sample Survey Organisation (NSSO). <ul style="list-style-type: none"> <li>○ For 2011-12, poverty line was estimated at Rs. 816 per capita per month for rural areas and Rs. 1,000 per capita per month in urban areas.</li> </ul> </li> <li>• <b>Findings: 21.9% of total population</b> were below poverty line in 2011-12.</li> </ul>
<b>Rangarajan Committee, 2014</b>	<ul style="list-style-type: none"> <li>• <b>Methodology:</b> Based on an independent large survey of households by Center for Monitoring Indian Economy (CMIE). <ul style="list-style-type: none"> <li>○ Poverty line was estimated as Monthly Per Capita Expenditure of Rs. 1407 in urban areas and Rs. 972 in rural areas.</li> </ul> </li> <li>• <b>Findings: 29.5% of total population</b> were below poverty line in 2011-12.</li> </ul>
<b>NITI Aayog's National Multidimensional Poverty Index: Baseline Report</b>	<ul style="list-style-type: none"> <li>• <b>Methodology:</b> Based on National Family Health Survey (NFHS-4) of 2015-16, which captures multiple deprivations faced by households across the three macro dimensions of health including nutrition, education and living standards.</li> <li>• <b>Findings: 25.01% of India's population</b> as multidimensionally poor.</li> </ul>
<b>Other committees for poverty estimation</b>	Alagh Committee (1979), Lakdawala Committee (1993)

### 3.8. PRADHAN MANTRI KAUSHAL VIKAS YOJANA

#### Why in news?

The Standing Committee on Labour, Textiles and Skill Development recently submitted its report on 'Implementation of Pradhan Mantri Kaushal Vikas Yojana (PMKVY)'.

#### About Pradhan Mantri Kaushal Vikas Yojana (PMKVY)

- It is the **flagship scheme of the Ministry of Skill Development & Entrepreneurship (MSDE)** implemented by National Skill Development Corporation.
- It has **two major components-**

- **Centrally Sponsored Centrally Managed (CSCM)** (Central Component), implemented centrally through National Skill Development Corporation (NSDC), and
- **Centrally Sponsored State Managed (CSSM)** (State Component), implemented by State Skill Development Missions / State Governments.
- **Objective of PMKVY:** To enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood.
  - Individuals with prior learning experience or skills are also assessed and certified under Recognition of Prior Learning (RPL).
- The scheme is presently in its **third phase**, which was launched in January 2021.
  - Several new initiatives like **Customized Crash Course Programme for COVID Warriors, Upskilling for Weavers and Artisans in Traditional Crafts in Nagaland and Kashmir** etc. were launched under PMKVY 3.0.

#### Implementation challenges identified in the report

- **Non-utilization of funds:** Under PMKVY 3.0, in 2021-22, out of the total fund allocation, only 72% was utilised.
- **Low placements:** Under PMKVY 3.0, out of about four lakh candidates, only 8% have been placed.
- **Poor functioning of Aatmanirbhar Skilled Employee Employer Mapping (ASEEM) Portal** due to the large gap in the number of candidates registered and those who actually secured employment.
- **Issues under the CSSM component:** Several State Skill Development Missions face issues such as-
  - **Delay in release of funds** from the State Treasury.
  - **Non-Availability of Trainers** with right Eligibility Criteria.
  - **Limited or non-availability of Placement Partner's** due to less Industrialization in the State.
  - **High pendency of assessments** with Sector Skills Councils.
  - **Delay in payments** to Sector Skills Councils etc.
  - **Lack of functional online management system:** Out of 36 States and UTs, the online management system for CSSM component is functional only in 15 States & UTs.

## Prime Objectives of PMKVY 3.0

Create an ecosystem for the youth to make informed choices on the available skilling avenues.



Provide support to youth for skill training and certification.



Promote sustainable Skill Centres for greater participation of private sector.



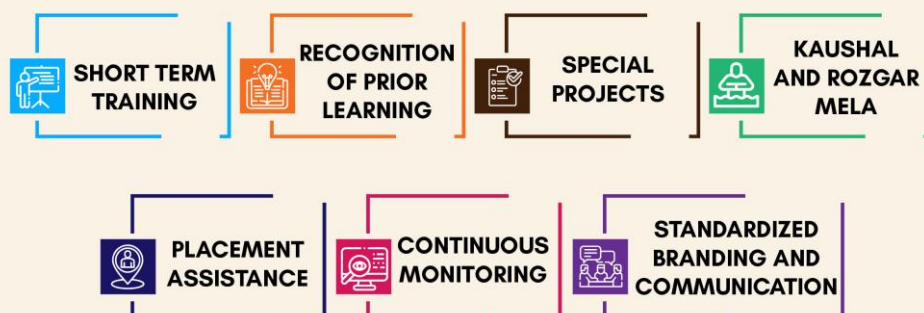
Benefit 8 lakh youth across the country.



## POSITIVE IMPACT OF THE SCHEME

Salary		▶ <b>15% increase</b> in mean monthly income of trainees.
Change in employment		▶ <b>76% candidates</b> acknowledged chances of getting another employment to be good.
Improved efficiency in current job		▶ <b>88% candidates</b> acknowledged rising efficiency in current job.
Recognition of Prior Learning		▶ <b>19% increase</b> in mean monthly income. ▶ <b>79%</b> acknowledged rise in <b>self-confidence</b> ▶ <b>51%</b> acknowledged rise in <b>tech knowledge</b> . ▶ <b>75%</b> acknowledged <b>better efficiency</b> in current job. ★

## KEY COMPONENTS OF THE SCHEME



- **Outdated skills:** Training course and curriculum under PMKVY have not been aligned with the actual industry requirements.
  - Also the practical skills imparted under PMKVY training are not as per the industry needs.
- **Complex procedures:** The process for reporting the placement details of the candidates is cumbersome.
- **High dropout rates:** During the implementation of PMKVY 1.0, 2.0 & 3.0, approx. 20% of the total enrolled candidates dropped out of the training programme.
  - Reasons include medical grounds, distance from residence to training centres, accessibility to a job, and issues specific to females such as pregnancy and marriage.
- **Non establishment of Pradhan Mantri Kaushal Kendras (PMKKs):** Out of the 818 PMKKs allocated, only 722 PMKKs had been established.
  - Reasons for non-establishment are non-availability of suitable infrastructure, COVID led operational and financial challenges, etc.
- **Rural-urban disparity:** Centres of PMKVY are concentrated more in urban areas.

#### Way Forward: Recommendations of the report

- **Regular monitoring and strict follow up action** to ensure optimal utilisation of the earmarked funds.
- **Making the certification process more transparent and effective** so that it facilitates more self-employment besides ensuring fair wages to the skilled candidates.
- **Boost the number of employers registered on the ASEEM portal** and encourage them to make use of the portal for the purpose of hiring/employing more skilled candidates.
- **Closely monitor the performance of the States** through timely and regular interventions to help the States improve their performance.
- **Work in tandem with the defaulting State Governments/UT Administrations** so that the online Management System is put in place there for prudent implementation of the Scheme.
- **Identify the areas where the Ministry could effectively intervene** and lend support to prevent dropouts.
- **Encourage Industry buy-in and contribution for skilling** including sharing of training infrastructure, demand aggregation, introduction of On-Job-Training (OJT), etc.
- **Enhance flexibility in course curriculums** by introducing courses in partnership with industry, Government Ministries/Departments and promote apprenticeship opportunities for candidates.
- **Encourage the industries/establishments and other employers** to participate in such Melas and offer employment opportunities.
- **Ensure establishment of the targeted PMKKs.**

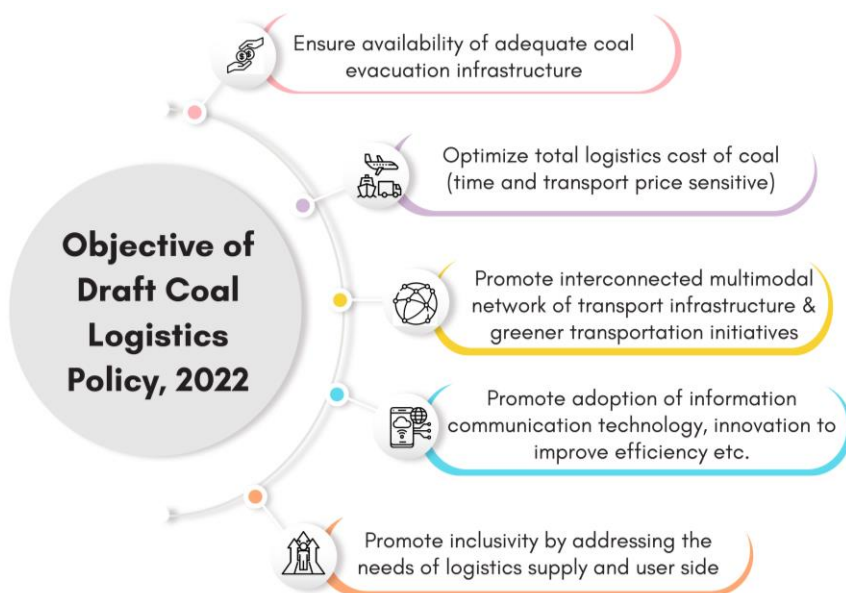
## 3.9. DRAFT COAL LOGISTIC POLICY 2022

### Why in news?

Recently, the **Ministry of Coal** has sought feedback on Draft Coal Logistic Policy, 2022.

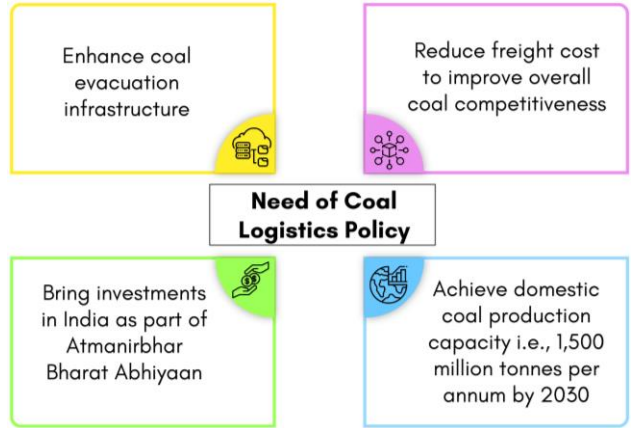
### About Draft Coal Logistic Policy, 2022

- Policy aims to **identify, evaluate & eliminate gaps in existing coal evacuation infrastructure & environment-friendly transportation of coal** from mine to the end-use plant.
  - Coal Logistics means **transport of Coal from origin to destination** through **single/multimodal mode of transportation** and includes storage, loading, for purpose of delivery to power plants, steel manufacturing, etc.





- Vision of Draft policy envisages is to develop a **technologically enabled, integrated, cost-efficient, resilient, sustainable, and trusted logistics ecosystem** for accelerated and inclusive growth.
  - As per '**Coal Vision 2030**' commissioned by Coal India in 2017, domestic coal demand was estimated to be **1,300-1,900 MT per annum by 2030**.

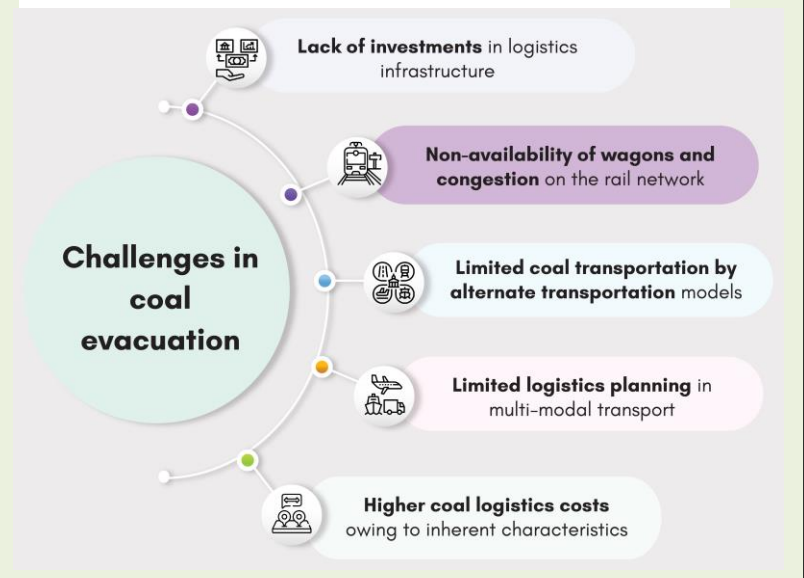
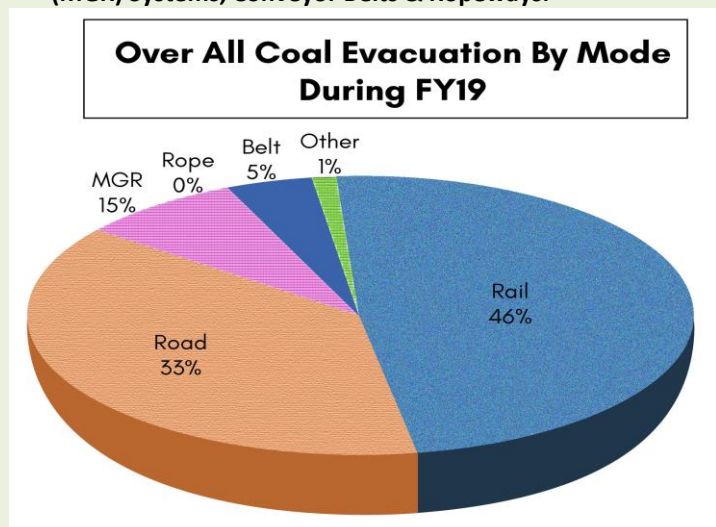


### Policy Strategies to be taken to improve coal logistics sector

- **Smart Coal Logistics Corridors:** It needs to be established for ensuring complete oversight on every tonne of coal from the mine to the consumption point.
  - 'Smart Coal Logistics Corridors' can be defined as **technology-enabled coal logistics chains that provide real-time information regarding logistics processes** from the mine to the destination.
- **Multimodal network of transport:** The Policy proposes to formulate a Multi-modal Integrated National Coal Evacuation Plan.
  - A Technical Support Unit and an Inter-Ministerial Committee (IMC) will be set up for formulating the Plan.
- **Rights of Way (RoW):** RoW of rail and roads and **first-mile evacuation are planned as part of the mine allocation process.**
- **Green transportation initiatives:** There is need to focus on modal shift to conveyors, railways and waterways from road transportation of coal.
- **Data-driven systems:** Development of data-driven systems for monitoring the logistics ecosystem to **enable higher logistics efficiency.**
- **Rationalise railway tariff:** Railway tariff rationalization for first- and last-mile connectivity to and from ports can enhance the viability of RSR (Rail - Sea - Rail route) for coal.
- **Other Initiatives**
  - **Common user facilities** like Railway Siding where there are 2-3 mines close to each other.
  - **Use of conveyor needs** to be promoted wherever it is economical to use.

### Coal transportation in India

- Coal evacuation infrastructure typically comprises of the following logistics segments:
  - **First mile logistics**
  - **Trunk mile logistics**
  - **Last mile logistics**
- Important modes of transport of coal are Rail, Road and the **Rail-cum-Sea route and captive modes such as, Merry-Go-Round (MGR) Systems, Conveyor Belts & Ropeways.**



### Way Forward

- **Focus on coal gasification:** This shall significantly reduce logistics cost and improve the overall profitability and viability of the project.

- **Improve transport and infrastructure:** Infrastructure developments driven by PPP, **restructuring of railway networks** to connect with coal bearing areas, **enhancing port capacities and evacuation efficiency**, augmenting existing capacities from existing ports etc.
- **Research and exploration:** Promote research and exploration activities and **modern underground mass production technologies** to deal with land acquisition related issues.
- **Engaging stakeholders:** Indian Railways, port authority and industry need to **work in close collaboration to plan development of infrastructural facilities** as per requirements.
- **Dedicated private lines:** Logistics availability and co-ordination in offtake arrangements for coal through railways needs dedicated private lines to be built in areas where future mining capacity will come up.

#### Initiatives taken to improve coal logistics

- **Freight Operations Information System (FOIS):** It helps to monitor movement of freight trains which also calculates freight and other charges.
  - The Centre for Railway Information Systems (CRIS) also offers Freight Business Data Integration (FBDI) for FOIS that can be used by the customers for integration with their internal MIS networks.
- **PM Gati Shakti:** The Plan will holistically look at the interventions required to be taken for reduction of logistics cost for coal evacuation and thus lead to efficiency gains in coal sector.

### 3.10. ONE NATION ONE FERTILISER (ONOF)

#### Why in News?

Ministry of Chemicals and Fertilizers launched **Pradhan Mantri Bhartiya Jan Urvarak Pariyojana - One Nation One Fertiliser scheme**.

#### About the scheme

- This scheme aims at **marketing fertilisers in the country under 'Bharat' brand name**.
- Under the scheme, **all subsidised soil nutrients** - urea, di-ammonium phosphate (DAP), Muriate of Potash (MOP), and NPK - **will be marketed under the single brand Bharat**.
  - The **uniform design of bags across the country** will now mention them as 'Bharat urea', 'Bharat DAP', 'Bharat MOP', 'Bharat NPK' and so on.
  - This is applicable to all **fertiliser companies, State Trading Entities (STEs) and Fertiliser Marketing Entities (FMEs)**.
- Scheme outlines the specifications of the new packaging for companies-
  - The new **"Bharat" brand name and PMBJP logo will cover two-thirds** of the front of the fertiliser packet.
  - The manufacturing brands can only display their name, logo, and other information on the **remaining one-third space**.

#### Related News

##### Pradhan Mantri Kisan Samruddhi Kendras (PM-KSK)

- Government also plans to develop more than **3.25 lakh fertiliser shops across the country as PM-KSK under Ministry of Chemicals & Fertilizers**.
- PMKSK will help in:
  - **catering to a wide variety of needs of the farmers** and provide agri-inputs (fertilisers, seeds, implements),
  - **testing facilities** for soil, seeds, and fertilisers;
  - **generate awareness** among farmers;
  - provide information regarding various government schemes.

Cabinet has **approved Nutrient Based Subsidy (NBS) rates for various Nutrients that is Nitrogen (N), Phosphorus (P), Potash (K) and Sulphur (S)** for Phosphatic and Potassic (P&K) fertilizers for 2022-23 Rabi Season.

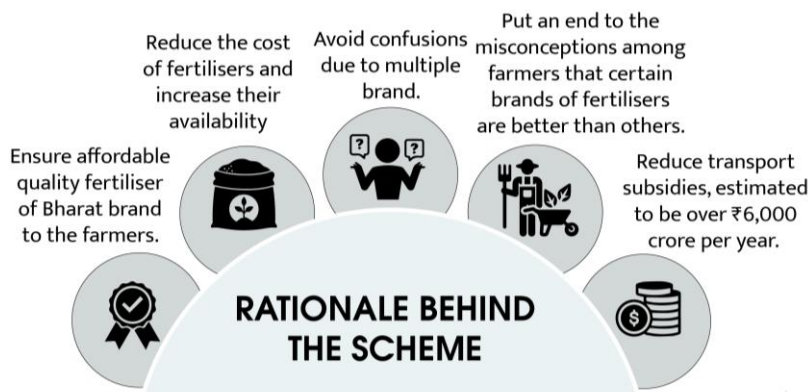
- This will help in:
  - **absorbing volatility in international prices of fertilizers and raw materials**
  - **provide smooth availability of fertilizers to farmers at subsidised / affordable prices**.
- **Commercial prices of fertilisers had almost doubled** due to Ukraine-Russia conflict and logistics issues due to pandemic.



## About Fertilisers in India

- Fertilizers have played an **essential role in agricultural production, providing vital nutrients for crops** and registering increasing demands over the years.
- There are 3 basic types of fertiliser used—**urea, Diammonium Phosphate (DAP), and Muriate of Potash (MOP)**.

Amongst them, **Urea is the most produced (86%), the most consumed (74% share), and the most imported (52%)**.



- Fertiliser industry **forms a part of the eight core industries**.
  - The Indian fertilizer market is projected to register a **CAGR of 11.9% during the forecast period 2022-2027**.
  - Government decides where manufacturers can sell their products under the **Fertiliser (Movement) Control Order, 1973 issued under the Essential Commodities Act, 1955**.
- Government provides subsidy to various fertilisers under different schemes.

## Fertilizer subsidy in India

- Government is making available fertilizers, **namely Urea and 25 grades for P&K fertilizers to farmers at subsidized prices** through fertilizer manufacturers/importers.
- Subsidy on P&K fertilizers is **being governed by Nutrient Based Subsidy (NBS) Scheme**.
  - NBS was **introduced in 2010, in continuation of erstwhile Concession Scheme (1992)**.
  - It covers **fertilizers with primary nutrients (N, P, K and S) as well as any variant of fertilizers with secondary and micronutrients (except S)**.
  - Subsidy is **released directly to fertilizer companies at approved rates** (based on Inter-Ministerial Committee) recommendation.
- Subsidy for urea is provided under **Urea subsidy Scheme**.
  - It is a **Central Sector Scheme** under which Urea is provided to the farmers at a statutorily notified Maximum Retail Price (MRP) below their normal supply-and-demand-based market rates or what it costs to produce/import them.
  - The difference between **the delivered cost of Fertilizers at farm gate and net market realization by the urea units** is given as subsidy to the Urea manufacturer/Importer by the Govt. of India.
    - ✓ So, it also includes freight subsidy for movement of urea across the country.
    - ✓ The subsidy is given to the fertilizer manufacturing companies and the rate of subsidy is decided on annual basis.
  - From March 2018, a new **direct benefit transfer (DBT) system was introduced**, wherein only upon the sale getting registered on the e-Urvarak platform can a company claim subsidy.



## Issues in Fertiliser sector in India

- High Fiscal Burden:** Fertiliser accounts for **large fiscal subsidies (about 0.73 lakh crore or 0.5 percent of GDP)**, the second-highest after food subsidy.
  - Large unpaid subsidy backlogs** create question on the sustainability of current subsidy regime.
- Import Dependency of Fertiliser sector:** India consumes 55 million metric ton (mmt) of fertilizers annually, of which nearly 30% is imported.



- **Ecological impact of excessive fertiliser usage:** Excessive use of fertilizers emits significant quantities of greenhouse gas into the atmosphere.
  - In many industrialized countries, overuse of fertilizers has resulted in contamination of surface water and groundwater.
- **Over regulations:** Economic Survey of 2016 highlighted that fertiliser sector is highly regulated and only a small proportion of the small and marginal farmers are benefited.
  - **24% of the subsidy is spent on inefficient urea producers**, of the remaining, 41% is diverted to non-agricultural uses and abroad; of the remaining, **24% is consumed by larger presumably richer farmers.**
- **Limitation for private sectors:** With the ONOF scheme, bar on branding will effectively deprive fertiliser makers of the ability to differentiate their products and retain market shares, serving as a deterrent to private presence in the sector.
  - Private players would also **have little incentive to experiment** with customised products or new nutrient combinations.

### Way Forward

- **Adjust inflation:** The main reason for the hefty cost of the fertiliser subsidy bill is that the Centre has not hiked selling prices even marginally to keep up with inflation.
- **Integrated Plant Nutrition Management Bill, 2022:** This bill has been put up for public consultation which **seeks to regulate the pricing, movement, distribution, import, and storage of fertilisers in the country** to ensure their balanced use in the country.
- **Awareness among farmers:** Farmers should be made aware regarding the benefits of balanced usage of fertilizers.
  - Also, modelling the fertilizer proportion according to different agro-climatic regions, is needed for the better growth and health of crops and soil.
- **Direct Benefit Transfer (DBT):** Centre can explore the more intuitive solution of decontrolling prices of fertilisers, while subsidising farmers directly through Direct Benefit Transfer (DBT).
  - Making subsidy payments directly into farmers' accounts instead of routing it through manufacturers **will help in targeting of small farmers and reduce leakages.**
  - It will also promote the Centre's **objective of making farmers aware of the subsidy element in fertilisers in a more direct manner.**

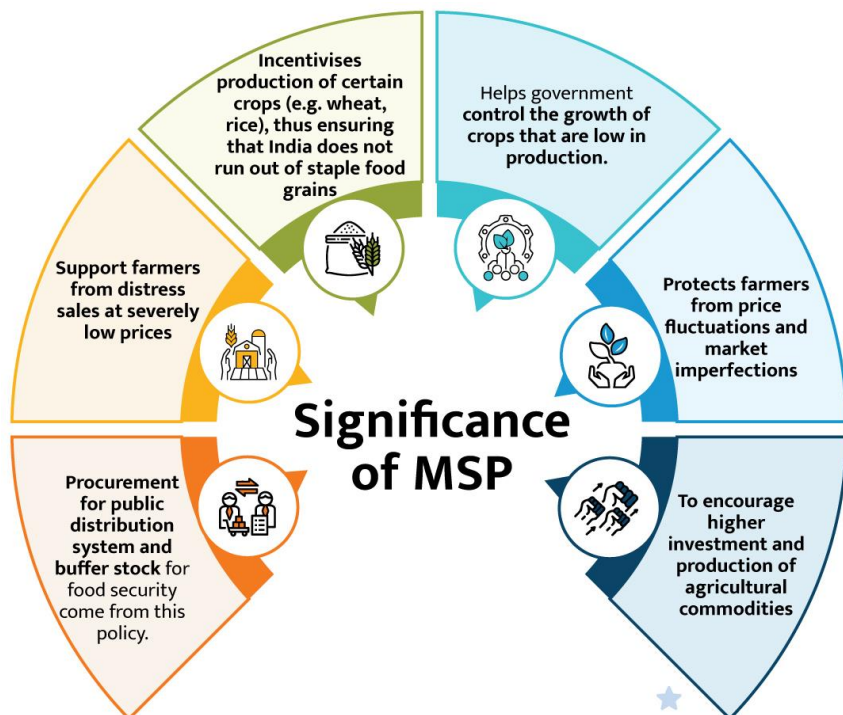
## 3.11. MINIMUM SUPPORT PRICE (MSP)

### Why in news?

Recently, **Cabinet Committee on Economic Affairs (CCEA)** approved an increase in Minimum Support Price (MSP) for six rabi crops for 2023-24.

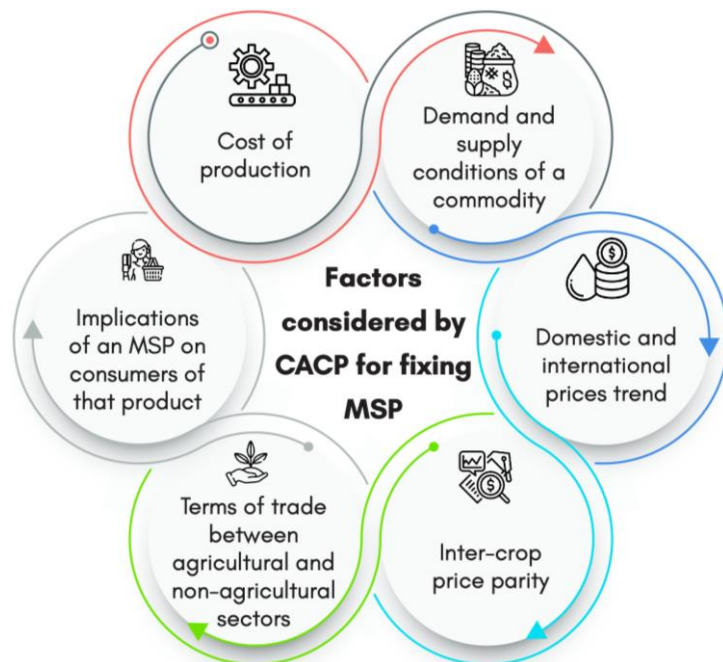
### More on news

- Increase in MSP is in line with **Union Budget 2018-19 announcement of fixing MSP** at a level of at least 1.5 times of All-India weighted average cost of production.
- **Maximum rate of return at current MSP is 104% for rapeseed and mustard**, followed by 100% for wheat and 85% for lentils.
  - The **larger increase in the MSP of mustard and rapeseed could also help in the diversion** of some area under wheat to these oilseeds.



## About Minimum Support Price (MSP)

- It is a **price support mechanism** that **acts as a safety net given to farmers** to ensure guaranteed prices and assured markets for their products.
  - The MSP-based procurement system is **aimed to save the crops from price fluctuations due to various unwarranted factors** such as the monsoon, information asymmetry etc.
  - MSP system was **started in 1966-67 for wheat and was expanded further to include other essential food crops**, which was then sold to the poor under subsidised rates under public distribution system (PDS).
- It is **fixed twice a year on recommendations of the Commission for Agricultural Costs and Prices (CACP-statutory body)** and then approved by CCEA.
- The CACP determines the **MSP based on the expenses incurred by the farmer (See infographics)**.
  - The final **MSP is determined as a function of expenses incurred (A2) and the imputed value of family labour (FL)**.
  - There have been **demands for considering a different costing method (C2)**.
  - National Commission on Farmers (Swaminathan Committee) had also recommended **MSP should be at least 50% more than the weighted average cost of production**.



## How are MSPs determined?

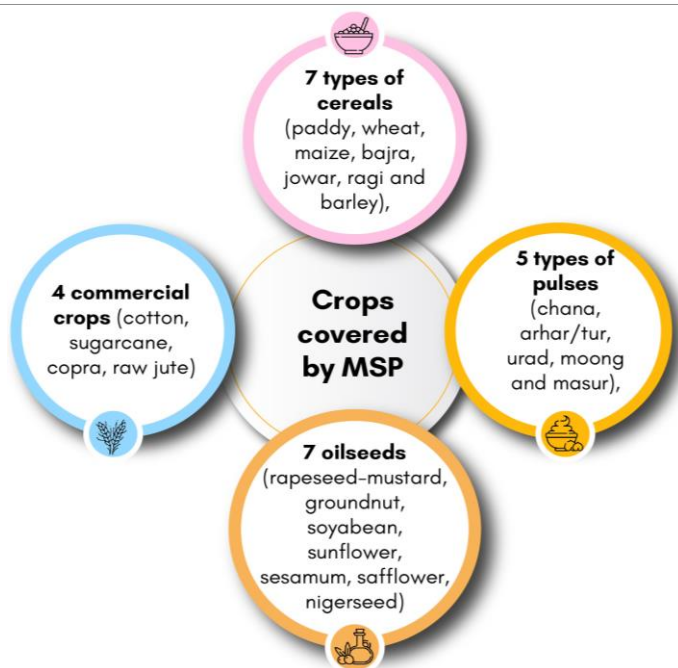
When a farmer grows a crop, he incurs costs, some of it explicit and some implicit or unpaid. The CACP considers the following costs:



Government consider A2+FL as production costs

## Issues associated with MSPs

- Procurement:** Delay in setting up procurement centres and **lack of government machinery for procurement** of other crops except wheat and rice (procured by Food Corporation of India).
- Disparity among states:** Farmers of states where the grain is procured completely by the government benefit more while those in states that procure less are often affected.
  - In 2021, more than 95% of paddy growers benefit from MSP in Punjab while in Uttar Pradesh, only 3.6% of farmer's benefit.
- Ecological:** MSP regime has led to **increased production of wheat and paddy** due to higher MSP offered on these crops. This has led to **ecological issues such as decreased ground water table, salinity** as seen in Punjab.
- Fiscal burden:** In 2020-21, food subsidy bill was nearly 30% of net tax revenue of the central government, reflecting huge financial burden on the government.



- **Middlemen:** MSP-based procurement system is **dependent on middlemen, commission agents and APMC officials, who rope in the maximum benefit** leaving farmer with low remuneration for the production.
- **Inflation targeting:** Higher MSPs could upend the Reserve Bank of India's inflation targets, hurting economic growth.
  - Every one percentage point increase in MSPs leads to a 15-basis point increase in inflation.
- **Make India's agri- exports non-competitive:** Mandatory MSPs will render India's agri- exports non-competitive because the government's assured prices are way higher than both domestic and international market prices.
- **Farmer Income:** Skewed MSP system of rice and wheat discourages farmers to grow other crops and horticulture products, which has higher demand and could lead to increase in farmers' income.

### Way forward

- **Improve procurement:** Government can bring a law on right to sell at MSP by marginal and small farmers with a carefully designed methodology.
  - Also procurement of crops should be linked with their production of each State.
- **Increase diversification in procurement interventions:** There is need to revisit the strategy on demand and supply, including PDS system, for balancing the nutritional security of the population.
- **Deficiency price payments (DPP) system:** In this scheme, the government, rather than procuring from farmers, compensates farmers with cash transfers when the market price falls below MSP.
  - Example, Bhavantar Bhugtan Yojana in Madhya Pradesh.
- **Area planning:** The cropping system should be tailored to local consumption patterns rather than for only getting the maximum price, irrespective of whether the produce has a demand or not.
- **Income support:** For many of non-staple commodities, MSPs are announced with little or no procurement. Thus, a gradual movement to an income-based support system is needed.
  - This also obviate the need for physical procurement and storage by the government.
  - PM-KISAN is currently attempting this, but the support under the programme is grossly inadequate.
- **Center-State Contributory Price Stabilization Fund:** It should be established to insulate farmers from a significant fall in prices, either due to domestic factors or global trade factors.

#### Demand for Legalizing MSP

- Recently, several farmers bodies **demand to legalize MSP**.
  - Legalising MSP would **put the government under a legal obligation to buy every grain of the crops** for which MSPs are announced.
  - MSP system was not backed by a parliamentary act and therefore, could never be legally enforced across India.

#### Issues with legalizing MSP

- **Fiscal burden:** Some estimates suggest that legalising MSP will cost annually about ₹17-lakh crore for purchasing the 23 mandated crops.
- **Demand for other crops:** If the MSP is legalised, **there will be a demand to include other crops**, particularly fruits and vegetables.
- **Storage:** Inadequate storage for grains procured by the government at MSP leads to post harvest losses.
- **Selling:** With stocks piling up, FCI will be forced to dump even more, and the price will get further depressed.
  - Such sale of agri-produce, combined with the ban on purchase below the MSP directly from the farmers, will then close all avenues for sale by the farmers.

## 3.12. DEVELOPMENT OF NORTH-EAST REGION

### Why in News?

Cabinet approved new Scheme “**Prime Minister's Development Initiative for North East Region (PM-DevINE)**”.

### About Prime Minister's Development Initiative for North East Region (PM-DevINE)

- PM-DevINE was **announced in the Union Budget 2022-23 to address development gaps** in the North Eastern Region (NER).
- It is a **Central Sector Scheme**.
- It will be **implemented by Ministry of Development of North Eastern Region (MDoNER)** through North Eastern Council or Central Ministries/ agencies.
- **Scheme will** have an outlay of Rs.6,600 crore for the **four-year period from 2022-23 to 2025-26** (remaining years of 15th Finance Commission period).



- PM-DevINE will provide support to infrastructure and social development projects which may be larger in size and will also provide an end-to-end development solution instead of isolated projects.
  - The average size of projects under other MDoNER Schemes is about Rs 12 crore only.
- **NER District SDG (Sustainable Development Goal) Index** (Baseline Report 2021-22) report (and its updates) would increasingly be used for project identification and formulation under PM-DevINE.
  - NITI Aayog and MDoNER, in collaboration with UNDP, have prepared the NER District SDG Index.

### Importance of development of North-East Region (NER)

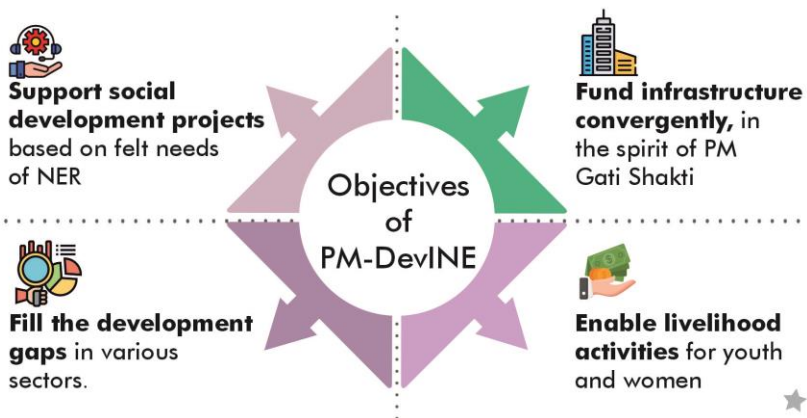
- **Geo-strategic location:** NER shares borders with countries such as Bangladesh, Bhutan, China, Myanmar and Nepal— and also connects India to the robust Southeast Asian markets making it conducive to international trade.
- **Huge potential in agriculture trade:** This is because of its suitable soil and other agro-climatic conditions.
  - For example, the marketable surplus for pineapple (95%), jackfruit (83%), cabbage (74%), orange (85%) etc. is high enough for exports.
- **For success of Act East Policy:** Without addressing the development related challenges of NER, no trade deals involving value chains in the NER and the neighbouring countries will yield desirable results.
- **Unharnessed resource endowments:** Important natural resources like land, forest vegetation etc., which are essential for creating employment and generation of GDP in NER are either underutilized, unutilized, and mismanaged.
- **Presence of potent input market catalysts** such as social capital (diversity, cultural richness), physical (potential energy supply hubs), human (inexpensive, skilled labour) and natural (minerals, forests) resources.

### Challenges faced in development

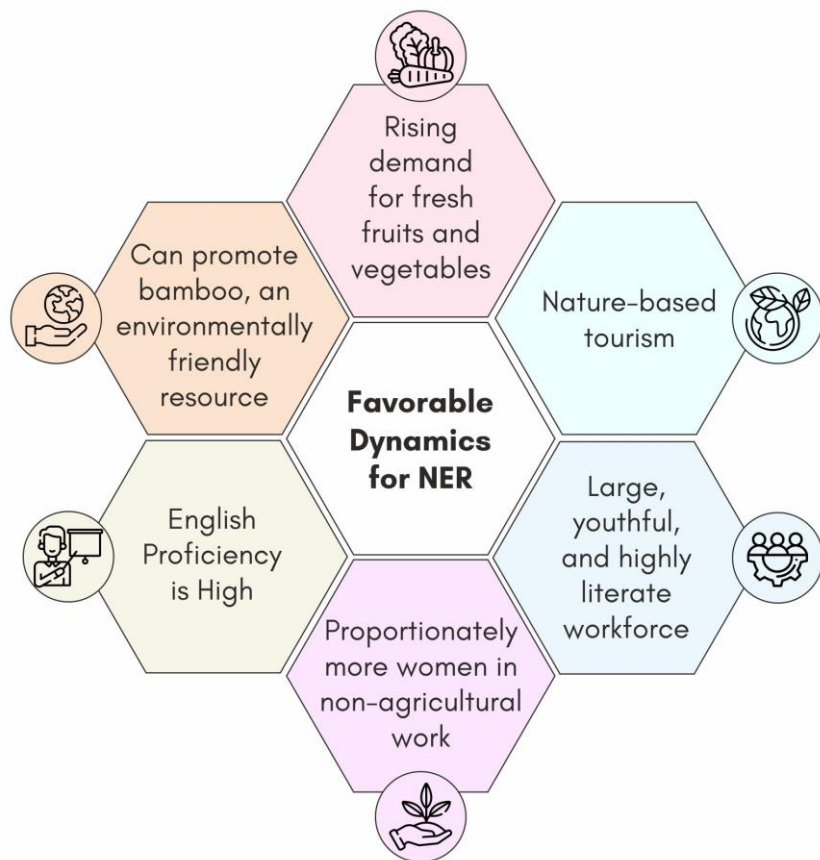
- **Geopolitical factors:** NER continues to suffer security concerns from the cross-border conflicts and other illegal activities.
  - Military takeover in Myanmar and rising anti-India sentiments in Bangladesh further complicate the situation.
- **Difficult terrain:** Almost 70% of the NER is hilly, with forests covering between 42 and 76% of the area of each of the States.
  - This poses one of the greatest constraints to rapid economic development.
- **Predominance of the Informal Economy:** There is rampant narcotics trading, as well as other illegal activities like weaponry trading and trafficking of rare animals and poaching leading to limited official border trade.
- **Infrastructure Bottlenecks:** It is key to the disconnect between NER and the rest of the country.
  - Poor infrastructure and lack of investment are mutually reinforcing, and hamper economic development in the region.

### About North East Region (NER)

- **NER comprises eight states:** Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.
- **Population of this region is over 45 million, which accounts for about 3.76% of India's total population.**
- The region covers around **8% of India's total land area.**
- It accounts for over a third of India's water resources and nearly 40% of the hydropower potential.



- **Challenges with trade facilitation with neighboring countries:** Goods must be transloaded between vehicles of different countries, and the clearance processes are lengthy, which adds to the time and cost of transportation.
- **Social unrest:** Because of armed insurgency, cross-border migration, movements that demand for separate federal states and autonomous units, and ethnic conflicts impede NER development.
- **Socio-environmental dynamics:** NER is also an ecologically sensitive zone, inhabited by several ethnic communities. Land is intrinsically linked to culture, and thus makes it imperative to ensure that any development activity takes this into account.



### Way Forward



Framework for development of the NER can be broadly based upon following vital components:

- **Social empowerment:** To empower rural communities, create sustainable institutions so that they manage common activities around microfinance, livelihoods and natural resource management.
- **Economic empowerment:** Develop the capacity of rural communities to plan and manage funds for various economic initiatives and common activities for the public.
- **Partnership development:** Partner with foreign investors, resource institutions and public and private sector organisations to bring resources such as finance, technology, and marketing into the projects so that the community groups are able to improve their livelihoods.
- **Subregional forums:** More focused approach in subregional forums, such as the Association of Southeast Asian Nations (ASEAN) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), can play an important role in enhancing trade and connectivity between the NER and India's neighbouring countries.
- **Ascertain consent of people to implement policies:** To ensure that economic development does not come at the expense of the environment or the social and cultural fabric of the region.
- **Others:** Development of logistics hubs and corridors, Ensuring interoperability of transport systems, improving trade facilitation, Tapping the potential of low-cost inland waterways, expanding air connectivity etc.

#### Initiatives taken for development of NER

- **North East Special Infrastructure Development Scheme**, to improve NER's infrastructure cover projects relating to **connectivity enhancing tourism** and supply of water and power etc.
- **Non Lapsable Central Pool of Resources (NLCP) Scheme** to fill up the gap in infrastructure sector of NER through sanctioning the projects prioritized by the State Governments.
- **North East Venture Fund**, first and only dedicated venture fund for NER, aims to promote business growth and skill development.
- **NITI Forum for North East** has been constituted for inclusive but sustainable economic growth in NER.
- **Special Accelerated Road Development Programme for North East.**
- **Infrastructure development:** Bogibeel Rail cum Road Bridge (on Brahmaputra river), New Greenfield Airport at Pakyong (Gangtok), Ro-Ro service between Neamati-Kamlabari( Majuli Island ), in Assam etc.
- **Science and Technology Interventions in North East (STINER)** to bring relevant technologies from S&T institutions to the farmers/artisans of NER.
- **Three newly emerging corridors with neighboring countries:**
  - Trilateral Highway linking India with Myanmar and Thailand.
  - Kaladan multimodal corridor linking Port of Sittwe in Myanmar to NER states.
  - Bangladesh-China-India-Myanmar economic corridor.

To know more about **Infrastructure Development in the North Eastern Region**, please refer to our following Weekly Focus Document.





 <p><b>Infrastructure Development in the North Eastern Region</b></p>	<p>Despite its enormous potential, the North Eastern Region of India is categorised as one of the backward regions. One of the major reasons behind this dichotomy is the poor development of infrastructure in the region. This document gives an insight into the underlying reasons for the same, the steps that are being taken by the government to improve the situation and the way forward to harness region's true potential.</p>	
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### 3.13. NEWS IN SHORTS

#### 3.13.1. LOGISTICS EASE ACROSS DIFFERENT STATES (LEADS) 2022 SURVEY REPORT

- Ministry of Commerce & Industry recently released Logistics Ease Across Different States (LEADS) 2022 survey report.
- LEADS is an **indigenous data-driven index** to assess logistics **infrastructure, services, and human resources** across all 36 States and UTs.
  - It's a key tool to **drive logistics sector efficiency that helps achieve target of bringing down logistics costs** compared to global benchmark.
  - It was **first launched in 2018**.
- Key highlights**
  - LEADS 2022 adopted classification-based grading system** while previous versions were based on ranking systems for all states. (refer infographic)
  - Three performance categories include**
    - ✓ **Achievers** (States/UTs achieving **90% or more percentage**)
    - ✓ **Fast Movers** (achieving scores **between 80% to 90%**)
    - ✓ **Aspirers** (achieving scores **below 80%**)
- Significance of LEADS**
  - Indicator of **efficiency of services** that are necessary to boost **trade competitiveness and economic growth**.
  - Brings to light **key logistics-related challenges**.
  - Offers recommendations** to remove various bottlenecks.
  - Guiding & bridging mechanism for **identification of interventions** enhancing logistics efficiency.

#### Logistics Ease Across Different States (LEADS) 2022

 Categories	 Achievers	 Fast movers	 Aspirers
<b>Landlocked states</b>	Haryana, Himachal Pradesh, Punjab, Telangana, Uttar Pradesh, Uttarakhand,	Madhya Pradesh, Rajasthan	Bihar, Chhattisgarh, Jharkhand
<b>Coastal states</b>	Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu	Kerala	Goa, West Bengal
<b>North-Eastern Region</b>	Assam	Sikkim, Tripura	Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland
<b>UTs</b>	Chandigarh, Delhi	Puducherry	Andaman & Nicobar, Daman Diu & Dadara and Nagar Haveli, Jammu & Kashmir, Ladakh, Lakshadweep

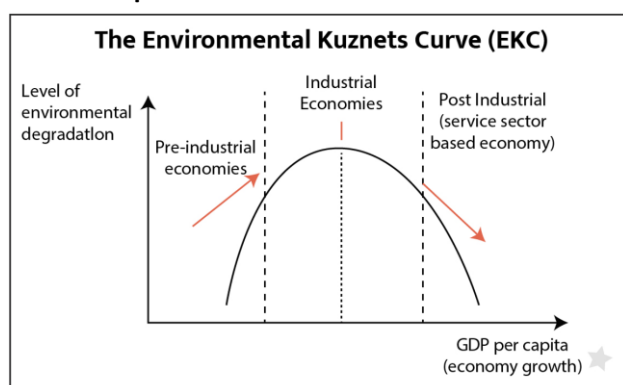
- Recommendations**
  - States should draft their respective logistics policy** in line with National Logistics Policy 2022.
  - Develop grievance redressal system** in line with Ease of Logistics (E-LogS) portal.
  - Identify and improve condition** of intersection roads points.
  - Establish dedicated land bank** for logistics infrastructure.

#### 3.13.2. INDIA'S GREEN GDP

- As per a recent RBI paper, **Green GDP is growing faster** (6.27% and 6.61% in the 2000s and 2010s) **than traditional GDP** (6.34% and 6.71%, respectively), as India took **measures to cut carbon emissions, improve resource use efficiency and boost clean energy capacity**.
  - Trend had been opposite in past three decades** of 20th century, implying **growth in that period was more damaging to environment**.



- Green GDP considers estimates for environmental degradation, depletion of natural resources, and savings of resources and environment into the national income accounts.
  - It involves subtraction of carbon emission cost, opportunity cost of waste generated, and adjusted savings of natural resource depletion from GDP.
  - United Nations first proposed idea of green GDP in 1993.
- Advantages of measuring Green GDP
  - Put emphasis on maintaining a balance between country's growth aspirations and environmental protection.
  - Helps to take holistic view, as traditional GDP calculation ignores cost of degradation of environment.
  - Helps in policy engineering to ensure sustainable development.



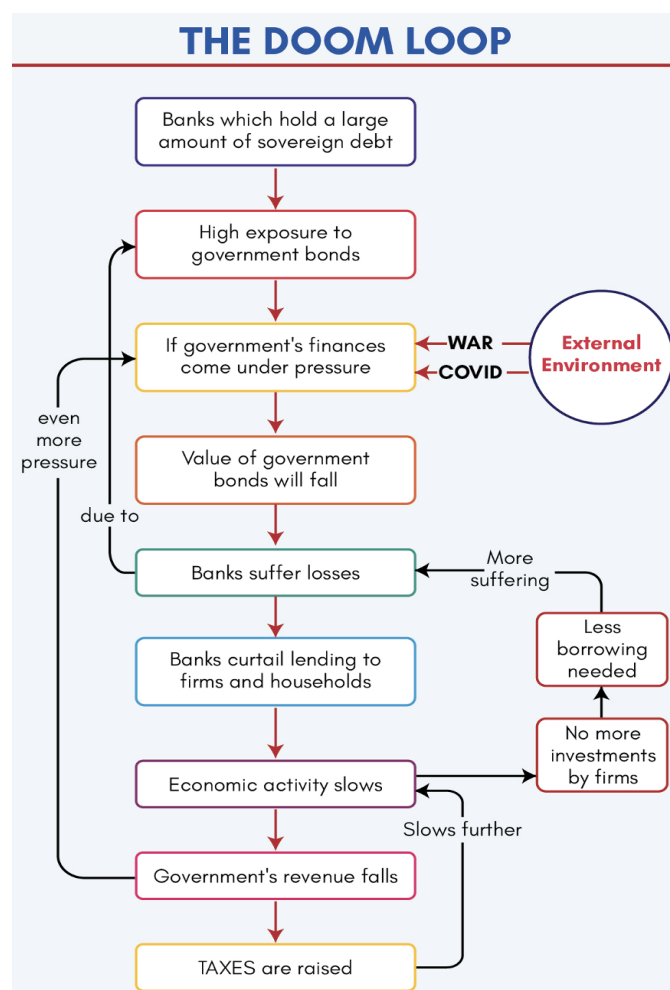
- Related information: Environmental Kuznets Curve (EKC)
  - EKC argues that in initial phases of economic development, there seems to be a positive relationship between pollution level and per capita income.

#### India's attempts to measure Green GDP

- Ministry of Statistics and Programme Implementation initiated compilation of environmental accounting under Natural Capital Accounting and Valuation of Ecosystem Services (NCAVES).
  - NCAVES project was launched in 2017 by UN and European Union to enhance knowledge and accounting process for ecosystem accounting.
- Green Accounting for Indian States & Union Territories Project (GAISP) to build a framework for environmentally adjusted national income accounts.
- Uttarakhand became 1<sup>st</sup> state in India to measure Gross Environment Product for quantifying ecological growth measurement.

### 3.13.3. DOOM LOOP

- According to economists, Europe is headed for doom loop.
- About Doom Loop
  - Doom loop is the circle of vulnerability where a country's banking system can be severely hurt by volatility in the price of the sovereign bonds, they hold for reserves resulting in a contraction in lending provided by the banks. (see image below)
  - It is a phenomenon whereby a shock to one part of its economic system is amplified by its effect on another.



### 3.13.4. STANDARD OPERATING PROCEDURE (SOP) FOR INTER-OPERABLE REGULATORY SANDBOX (IORS)

- The SOP is prepared by the inter-regulatory technical group (IRTG) on fintech, chaired by RBI's fintech department and representatives of Sebi, Irdai, IFSCA, PFRDA and the central government.

- It provides a framework to regulate newer fintech products and services falling in the ambit of more than one financial regulator (see image).
- IoRS is 'a mechanism to facilitate testing of innovative hybrid financial products / services falling within the regulatory ambit of more than one financial sector regulator'.
- **Key highlights of the framework**
  - **The dominant feature** of the product will determine influence of the regulator and regulator under whose jurisdiction such feature will come. This regulator will be the **principal regulator (PR) and others will be associate regulators (AR)**.
  - The dominant position will be decided in two ways:
    - ✓ type of **enhancement to the existing products** like loans, deposits, etc.,
    - ✓ number of **relaxations sought by the entity for undertaking** the test under IoRS.
  - **International Financial Services Centres Authority** will be PR for Indian FinTechs having global ambition and foreign FinTechs seeking entry to India.
  - **IRTG on FinTech** will resolve any coordination issue between PR and AR etc.

### FINANCIAL REGULATORS



#### RBI (Reserve Bank of India)

It is India's central bank and regulatory body responsible for regulation of the Indian banking system, payment and settlement systems etc.



#### SEBI (Securities and Exchange Board of India)

It acts as a market regulator to promote and regulate the securities market and protect the interests of investors in securities.



#### IRDAI (Insurance Regulatory and Development Authority of India)

It manages and regulates the insurance and reinsurance industry in India along with registering and/or licensing insurance, reinsurance companies and the intermediaries.



#### IFSCA (International Financial Services Centres Authority)

It is a unified authority for the development and regulation of financial products, financial services and financial institutions in the International Financial Services Centre (IFSC) in India.



#### PFRDA (Pension Fund Regulatory and Development Authority)

It regulates NPS and any other pension scheme not regulated by any other enactment.

### 3.13.5. ASSET RECONSTRUCTION COMPANIES (ARCS)

- RBI has amended regulatory framework for Asset Reconstruction Companies (ARCs).
- It was based on recommendations of the **committee headed by Sudarshan Sen to undertake comprehensive review of the working of ARCs**.
- **Key guidelines are:**
  - Allowed ARCS with **minimum net owned fund** of ₹1000 crore to act as **resolution applicants** under the **Insolvency and Bankruptcy Code (IBC) 2016**.
    - ✓ Earlier, Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act (**SARFAESI Act**) **prohibited ARCs from doing other activities than that of securitisation or asset reconstruction, without RBI's permission**.
    - ✓ IBC provides for a **time-bound process for resolving insolvency** in companies and among individuals.
  - **Raised minimum capital requirement** for setting up an ARC to Rs 300 crore from the existing Rs 100 crore in a phased manner.
  - **Changes in corporate governance norms**, like to **constitute an Audit Committee**, which shall comprise of non-executive directors only.
- **About ARC**
  - ARC has been set up to provide a **focused approach to Non-Performing Assets resolution** on recommendations of **Narasimham Committee- II**.
  - It is a company **registered under Section 3 of SARFAESI Act, 2002**.
  - It is **regulated by RBI** as a Non-Banking Financial Company.

### 3.13.6. DEBTS RECOVERY TRIBUNALS (DRTS)

- Govt recently formed exclusive benches at 3 debts recovery tribunals (DRTs) to resolve cases above Rs 100 crore.
- Government has created these exclusive benches at **DRTs in Chennai, Mumbai and Delhi**.
  - This has been done in view of a **long-standing demand by banks to get more focus on high-value cases**.
- **Significance of this move**
  - High-value cases are estimated to be numbering only 1%, but the amount wise **constitutes 80% of claims**
  - Presently, **lot of privately held companies in India are registered as partnerships or family concern**.

- ✓ These **cannot be tried under the insolvency and bankruptcy code (IBC)** in the National Company Law Tribunal which deals with companies only.
- Also, data from RBI show that **DRTs had ₹2.25 lakh crore of debt pending under litigation as of March 2021**
- **About DRTs**
  - **The Recovery of Debts and Bankruptcy Act (RDB Act), 1993** provides for establishment of DRTs with original jurisdiction and Debts Recovery Appellate Tribunals (DRATs) with appellate jurisdiction.
  - **Objective of these tribunals** is to provide expeditious adjudication and recovery of debts due to Banks and Financial Institutions.
  - It also hears cases filed under **The Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002**.
  - At present, **39 DRTs and 5 DRATs are functioning across the country.**

- In respect of **transaction-based guarantee** cover, the guarantee cover is obtained by the lending institutions on **single eligible borrower** basis.
- Umbrella-based guarantee cover will provide guarantee to **Venture Debt Funds registered under AIF regulations of SEBI.**
- Scheme will be operated by **National Credit Guarantee Trustee Company Limited.**
- This scheme will **complement the existing Schemes under Startup India initiative viz. Fund of Funds for Startups and Startup India Seed Fund Scheme.**
  - **Other programmes under Startup India:** Support for Intellectual Property Protection, Self-Certification under Labour and Environmental laws, Income Tax Exemption for 3 years, Startup India Hub etc.

## Start-up ecosystem in India

More than

**75000** startups recognised

**3<sup>rd</sup>** largest ecosystem for startups in the world.

**7.46** lakh jobs have been created.



### Related terms

- Venture debt is a **type of loan offered by banks and nonbank lenders that is designed specifically for early-stage, high-growth companies with venture capital backing.**
- AIFs are **privately-pooled investment vehicles for investing in non-traditional asset classes** such as infrastructure funds, private equity funds, venture capital funds, among others. They allow investors to diversify from conventional asset classes.

## 3.13.9. NORTHWARD SHIFT IN SUGARCANE PRODUCTION

- According to the latest NSSO report, northern sugarcane-producing states saw a 42 per cent increase in their output value between 2011 and 2020 while that of southern states declined 32.4 per cent during the same period.

### 3.13.7. DAKSH

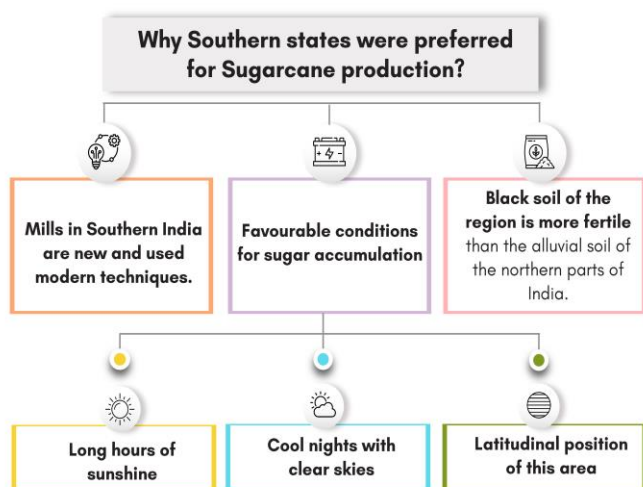
- RBI launched advanced supervisory monitoring system DAKSH.
- DAKSH is a **web-based end-to-end workflow application** that **monitors compliance requirements** in a more focused manner with the objective of **further improving the compliance culture** in Supervised Entities (SEs) like Banks, NBFCs, etc.
- The **application will also enable seamless communication, inspection planning, execution, cyber incident reporting, and analysis, which enables anytime-anywhere secure access.**
- DAKSH means '**efficient**' and '**competent**', reflecting the **underlying capabilities** of the application.

### 3.13.8. CREDIT GUARANTEE SCHEME FOR STARTUPS (CGSS)

- Department for Promotion of Industry and Internal Trade (DPIIT) recently notified establishment of Credit Guarantee Scheme for Startups (CGSS).
- It aims to **provide credit guarantees to loans** extended by Scheduled Commercial Banks, Non-Banking Financial Companies and Securities and Exchange Board of India (SEBI) registered Alternative Investment Funds (AIFs) to **finance eligible Startups.**
  - It was envisaged under **Startup India Action Plan** launched in **2016.**
- Credit guarantee cover would be **transaction based and umbrella based.**



- The NSSO report shows the cumulative production value of sugarcane in **Bihar, Haryana, Punjab, Madhya Pradesh, Uttar Pradesh, and Uttarakhand** which increased from Rs 30,216 crore to Rs 42,920 crore.
  - Meanwhile, the sugarcane output in the five southern states of **Andhra Pradesh, Karnataka, Telangana, Tamil Nadu, and Maharashtra** declined from Rs 26,823 crore to Rs 18,119 crore in the corresponding period.
- **Reasons for northward shift in sugarcane production**
  - **State Advisory Price (SAP):** Higher SAP over and above the Fair and Remunerative Price (FRP) being offered in the north, especially by Uttar Pradesh.
    - ✓ For example, the UP government pegged sugarcane SAP at Rs 340 per quintal last year whereas sugarcane farmers in **Tamil Nadu, Karnataka, and Maharashtra** were only able to realise prices in the range of **Rs 280-310**.
  - **Water management:** The northward shift in sugarcane production is on account of larger irrigated area in the region.
    - ✓ Sugarcane requires large amounts of water to cultivate and frequent droughts in Maharashtra and Karnataka in recent years has led to widespread farm distress.
  - **Climate change:** Prolonged summer, erratic rainfall and shortening of winter season in southern states have drastically reduced sugar production from cane.
    - Also, Incidence of diseases like rust, leaf spots, pokka boeng (leaf malformation), smut (presence of black or grey growth on the cane) etc. has also increased.
  - **Focus on other valuable crops:** Southern states are diverting their water to higher value crops.
  - **Other factors:** This includes heat-tolerant sugarcane variety and improved farm management strategies.



### 3.13.10. QUALITY COUNCIL OF INDIA (QCI)

- Recently, Quality Council of India (QCI) celebrated its Silver Jubilee.
  - It is a non-profit organization **registered under the Societies Registration Act XXI of 1860**.
  - It is an autonomous body.
  - It was set up through a **PPP model in 1997** by the **Ministry of Commerce and Industry jointly with the Indian Industry**.
    - ✓ It is under the administrative control of Department for Promotion of Industries and Internal Trade (DPIIT).
  - Indian industry is represented by the three premier industry associations i.e. **ASSOCHAM, Confederation of Indian Industry (CII) and FICCI**.
- It aims to establish and operate national accreditation structure and promote quality through National Quality Campaign.
- It is governed by a Council with equal representations of government, industry and consumers.
  - Chairman of Council is **appointed by the Prime Minister on recommendation of the industry to the government**.
- QCI has also launched a campaign—**Gunvatta Se Atmanirbharta: India's quality movement** to celebrate India's quality hubs.

#### Major Achievements of QCI in various sectors

- **Healthcare and laboratories**
  - Launched **PM Jan Arogya Yojana quality certification programme** with National Health Authority for its empanelled hospitals across India.
  - **Accredited 87 food testing labs** under integrated assessment with Export Inspection Council, APEDA and FSSAI.
- **Education**
  - **Collaborations** with Ministry of Education (MOE) for **Quality Intervention in the field of school education**
  - Launched **QCI's eLearning platform [eQuest: E-Quality Platform for Employability through Skill and Training]**
- **Environment and cleanliness**
  - QCI **certifies ULBs as ODF (Open Defecation Free) ODF+ and ODF++** to ensure the accessibility of clean and functional toilets to all its citizens.
  - These categories are under Swachh Bharat Mission.
  - **Ranks railway stations across India** to monitor cleanliness and sanitation initiatives to fulfil the Ministry of Railways mission of Swachh Rail, Swachh Bharat.
- **Economy**
  - Third party **sampling and testing of 20% of Coal produced in India by Coal India Limited**. This has **helped in standardizing the cost of coal mined in India** based on its calorific value to non-power customers.

- Conducted a three-layer **evaluation of the Start-Up Village Entrepreneurship Programme** in partnership with Ministry of Rural Development.
- **Financial support provided to 332 MSMEs**, including 43 MSMEs owned by Women entrepreneurs under Zero Defect Zero Effect (ZED) Certification Scheme.

### 3.13.11. BUSINESS 20 (B20)

- Department for Promotion of Industry and Internal Trade (DPIIT) hosted Conference on **B20 Indonesia Global Dialogue** in partnership with Confederation of Indian Industry.
- **About B20**
  - **Formed in 2010**, it is the **official G20 dialogue forum** with global business community.
  - Aims to deliver **concrete actionable policy recommendations on the priorities** by each rotating presidency to spur economic growth and development.

### 3.13.12. INFRASTRUCTURE STATUS TO DATA CENTRES

- The government has accorded **infrastructure status to data centres with more than 5MW capacity of IT load.**
  - Data centre is **included in Harmonized Master List of Infrastructure sub-sectors.**
  - Data centres capacity is measured in terms of **power they consume which reflects on scale of server** they are hosting in their facilities.
  - Earlier, it was announced in **budget speech 2022-23.**
- **Significance of move:** Helps data centre companies to **get easier access to institutional credit at lower rates, attract foreign investments etc.**
- Also, in 2020, **Ministry of Electronics and Information Technology** has released **Draft Data Centre Policy.**
  - It aims to make **India a Global Data Centre hub**, promote investment in sector and facilitate state of art service delivery to citizens.
- **Why focus on data centres?**
  - Presently, India has **around 499 MW installed power capacity** for Data Centres and is projected to grow to **1007 MW by 2023.**
  - **Data localisation norms** make it **crucial to set up a robust data centre infrastructure** India.
  - This is **necessary to protect India's digital sovereignty** in connected world.

#### About Data Centre

- It is a **dedicated secure space within a centralized location** where computing and networking equipment is concentrated for purpose of **collecting, storing, processing, distributing or allowing access to large amounts of data.**
- It provides **Network infrastructure** (connects servers etc. to end-user locations); **Storage infrastructure** (to store data); and **Computing resources** (provide processing, memory, etc. that drive applications).

### 3.13.13. CODEX ALIMENTARIUS COMMISSION (CAC)

- Recently, the **Codex Committee on Spices and Culinary Herbs (CCSCH)** has finalized and recommended **quality standards for nutmeg, saffron, chilli-peppers, and paprika** and forwarded these proposed standards to the Codex Alimentarius Commission.
  - The Codex **Alimentarius is international food standards, guidelines and codes** of practice contribute to the safety, quality and fairness of this international food trade.
  - These food standards, guidelines and codes helps on **Protecting Consumer Health and Removing Barriers to Trade**
- **Codex Alimentarius Commission (CAC)** is the body responsible for all matters regarding the implementation of the Joint Food and Agriculture Organization (FAO) and WHO Food Standards Programme.
  - Membership of the Commission is open to all Member Nations and Associate Members of FAO and WHO which are interested in international food standards.
  - The Commission meets in regular session once a year alternating **between Geneva and Rome** and **works in the six UN official languages.**
- **About CCSCH**
  - It is a committee under CAC to elaborate worldwide standards for spices and culinary herbs.
  - **India is the host country** for Codex Committee on Spices and Culinary Herbs (CCSCH).

### 3.13.14. PUBLIC-PRIVATE PARTNERSHIP (PPP) ROUTE

- Railway Ministry Plans to bid out 16 Stations under Public-Private Partnership (PPP) Route.
- This is in **addition to the 1253 railway stations that have been identified for development under the Adarsh Station Scheme.**

- These railway stations will be **upgraded to ensure improved basic facilities and accessibility for passengers.**
- PPP refers to a **cooperative agreement between the government organization and a private firm to execute a project** or provide services to the **local population for the long term.**
  - It encompasses several delivery models such as **Operation & Maintenance (O&M), Built-Operate Transfer (BOT), Builds–Own–Operate–Transfer (BOOT), Design-Finance-Build-Operate-Transfer,** etc.
- **Benefits**
  - Help in recovering the project cost, as the present railway fair is highly Cross-subsidization.
  - **Increase the competition and efficiency in the modernization of railway projects.**
  - Tackle the **underperformance of the railway** due to a lack of skilled workforce and other construction equipment.
- **Challenges for PPP in Railways**
  - Delay in **land acquisition and multiple clearances** and approvals from various regulatory bodies.
  - **Unviable tendering of PPP projects owing to lack of proper planning and unrealistic cost estimates.**
  - Ineffective dispute resolution
  - Lack of standard PPP practices in line with global standards.

### 3.13.15. COMMITMENT TO REDUCING INEQUALITY (CRI) INDEX

- **India Ranked 123** (161) for reducing inequality, improving by 6 places from previous ranking.
- The **2022 CRI Index** looks at government policies and actions in 161 countries to fight inequality during the first two years of the COVID-19 pandemic.
- Index is prepared by **Oxfam International and Development Finance.**

### 3.13.16. BHARAT SERIES (BH)

- Recently, the Ministry of Road Transport and Highways (MoRTH) has proposed to **allow conversion of regular vehicle registrations into Bharat Series (BH) numbers.**
  - **At present, only new vehicles can opt for BH series mark.**
  - But with proposed amendment regular registration mark can also be converted to BH series subject to payment of requisite tax.
  - Also, the **transfer of vehicles with BH series registration mark to other persons,** who are eligible or ineligible for BH series, has been facilitated.

- Ministry of Road Transport came with BH series to **ensure seamless transfer of vehicles across states and free vehicle owners from re-registration process** when they shift from one state/UT to another.
  - Vehicle registration **facility under ‘Bharat series (BH series)’ is voluntary** to defense personnel, employees of central and state government, PSUs, private sector companies having their offices in four or more states/UTs.
  - **Working Certificate is needed to be submitted** by private sector employees to prevent misuse.

### 3.13.17. ALUMINIUM WAGONS

- Recently, Union railway minister flagged off the **country’s first freight train with an all-aluminium wagon rake.**
  - It is manufactured in collaboration with Besco Limited Wagon Division and aluminium major Hindalco.
  - As reported, Indian railway is planning to deploy more than one lakh wagons in the coming years.
- At present, India’s high-speed trains, including the Rajdhani and the Shatabdis, **use Linke Hofmann Busch (LHB) coaches that are made of stainless steel.**
- **Significance:**
  - **Lower carbon footprint:** due to its lower weight. It is estimated that **for every 100 kg weight reduction of the wagon, the CO<sub>2</sub> saving is 8-10 tonnes.**
  - **Recyclable:** Aluminium trains are 100 per cent recyclable.
    - ✓ The recyclability will also help in times of global volatility in metal prices.
  - **Make Indian Railways’ logistics more efficient**
    - ✓ **Carry extra load:** It can carry 180 tonnes extra payload per trip over conventional rakes
    - ✓ **Reduce maintenance cost:** Being corrosion resistant, will reduce maintenance costs.
    - ✓ **Speed up production:** Aluminium trains take less time to manufacture and thus can help speed up capacity for production.
  - **Reduce import:** The iron and steel industry consume a lot of nickel and cadmium which are imported. So, proliferation of aluminum wagons will result in less import.
  - **Boost domestic industry:** This is good for the domestic aluminum industry.
- Though an all-aluminium passenger coach and wagon system would **raise the cost of manufacturing rolling stocks by about 35%** since the price of aluminium, globally, is far higher than that of steel. However, the **advantages of the metal outscore its high price.**

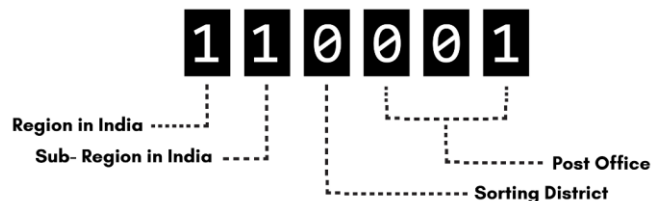


### 3.13.18. POSTAL INDEX NUMBER OR PIN CODE

- Golden Jubilee of PIN Code was commemorated.
- PIN (Postal Index Number) Code, also known as **Zip Code** or **Area Code**, is the post office numbering code system used by India Post.
- It was **first introduced** on **August 15, 1972**.
- It is a **6 digits long code** with **each digit denoting a particular meaning** (see image).

- Overall, India is divided into 9 postal regions (zones) with the **first eight as geographical regions and ninth being Indian Army**.

#### PIN (Postal Index Number) Code



**SMART QUIZ**

You can scan this QR code to practice the Smart Quiz of Economics at our open test online platform for testing your understanding and recalling of the concepts.



# 4. SECURITY

## 4.1. USE OF SPACE FOR DEFENCE

### Why in news?

Prime Minister launched **Mission DefSpace** at the annual **Defense Expo** held in Gandhinagar, Gujarat.

### More about news

- It seeks to develop **innovative solutions for the Armed Forces in the space domain** through industry and start-ups.
- Under the mission, 75 challenges are being opened to get **innovative solutions**, based on the **defence requirements in the space domain**.

### Use of space for defence

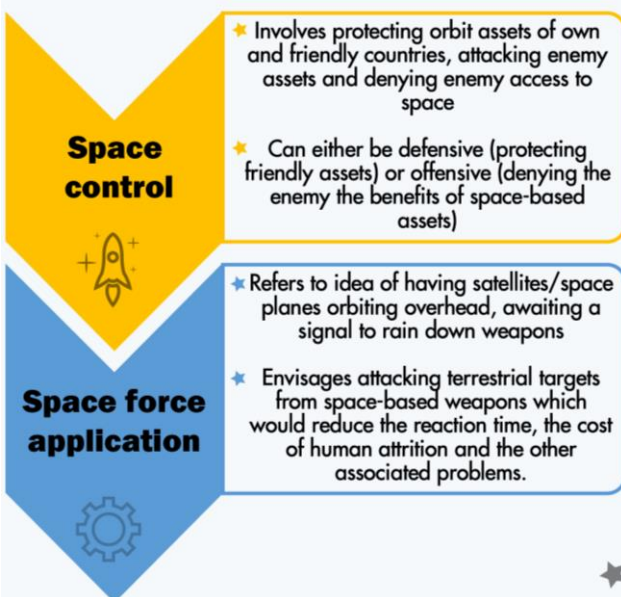
Use of space for defence can be explained through militarisation of space and weaponisation of the space.

- **Militarisation of the space:** It refers to the use of the space to support the **ground, sea and air based military operations**.
  - Herein, the assets such as **early warning communication system, navigation, command and control**, etc are being placed in space in order to assist the ground infrastructure of military.
- **Weaponisation of the space:** Placing of **space based devices** in the orbit that have **destructive capabilities**. **Hypersonic technology vehicles** that travel in the space to reach the intended target also **weaponise the space**.
  - At its most extreme, space weaponisation would include the **deployment of a full range of space weapons**, including satellite-based systems for Ballistic Missile Defence (BMD), space-based Anti-Satellite (ASAT) weapons and a variety of Space to Earth Weapons (STEWs).
  - **Two subsets of weaponisation of space** are space control and Space force application.

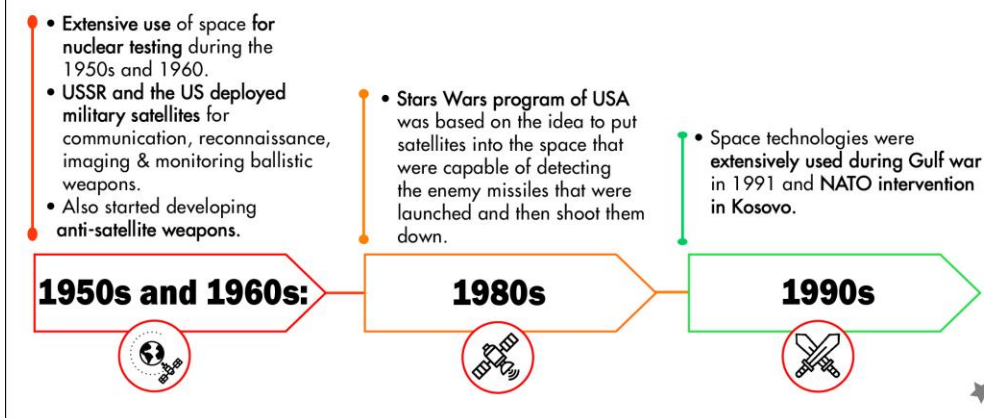
### Factors driving growing use of space for defence

- **Geopolitical churning aggravating threat scenario:** Technological advancement by the developed states such as the USA and then USSR **created geopolitical chain reaction**.

### SUBSETS OF WEAPONISATION OF SPACE



### Tracing the use of space for defence








### Other Global framework for regulation of Space

- **Partial Test Ban Treaty (PTBT)** prohibits nuclear weapons tests "or any other nuclear explosion" in the **atmosphere, in outer space, and under water**.
- **U.N. Office for Outer Space Affairs (UNOOSA)** supports governments in building **legal, technical, and political infrastructure** to support global space activities.
  - It maintains a **registry of objects** launched into Outer Space.
- **Inter-Agency Space Debris Coordination Committee's (IADC) Space Debris Mitigation Guidelines** which cover the **overall environmental impact** of the missions with a focus on Limitation of debris and Post-mission disposal.

- Rivalry between USA and China to be superpower led China to successfully conduct an **ASAT Test in 2007** which raised security concerns in India.
- In 2016, China also launched **QUESS, world's first quantum communication satellite**.
- In 2019, India had become the **fourth country** after United States, Russia and China to conduct **Anti Satellite missile test** (dubbed as **Mission Shakti**).

## UN COPUOS

* U.N. Committee on the Peaceful Uses of Outer Space (COPUOS) to govern the exploration and use of space for the benefit of all humanity. * It oversees five international treaties underpinning space law:				
 <b>Outer Space Treaty:</b>	 <b>Rescue agreement:</b>	 <b>Liability Convention:</b>	 <b>Registration Convention:</b>	 <b>Moon Agreement:</b>
It provides the <b>basic framework</b> on international space law, covering legal foundations such as the <b>peaceful use of space, and liability of state</b> for launching space objects.	It provides that states shall take <b>all possible steps to rescue and assist astronauts in distress</b> .	It provides for <b>absolute liability on the part of a launching state</b> to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft.	It lays down the <b>rules applicable for the registration</b> of space objects, and the <b>open and free access</b> of these registers.	It provides that the Moon and its natural resources are the common heritage of mankind.

- **Lack of an effective regulatory mechanism:** Currently, there is **no organisation that is empowered to regulate space**. The OST (outer Space Treaty) **lacks the legal and structural capacity** to effectively regulate space.
  - Also, with growing space mission and launches, the **Kessler Syndrome becomes a real threat**.
  - **Kessler Syndrome** is a scenario in which Earth's orbit is overpopulated with objects and debris, causing catastrophic collision amidst them.

- **Weak and ambiguous laws:** The OST makes it clear that **weapons of mass destruction cannot be deployed** in space, but does nothing to **constrain the development, testing, and deployment of non-nuclear space weapons**. Also, defining **what constitutes a 'space weapon'** is becoming increasingly difficult.
  - Further, countries are **divided on the phrase "peaceful purposes"**.

- **Space is becoming the next frontier of war:** Space is fast emerging as an area of **geo-political conflict**. As reliance on Space grows, **Space-based assets** will become centers of gravity that are likely to be **targeted in war and 'less than war' situations**.




- Countries like America and China have already established **space dedicated military commands**.
- Space **especially the Low Earth Orbits** is becoming **more accessible**, even to countries with **no previous aspirations in space and relatively small budgets**.
- **This has the potential to trigger a space arms race**.

- **Military-civil fusion:** Security concerns are compounded by the fact that **many key space capabilities are dual-use**, making any space technology development a **potential weapons programme**.
  - **Thus**, Boundaries that separate civil and military Space assets are getting blurred.
  - The **evolution of Space capabilities** has resulted in it becoming possible that even civilian assets **may be actually used to apply military force**.

### How can we prevent space from becoming a warfighting domain?

- **Bringing new law/treaty:** There is an immediate need to **revise the Outer Space Treaty** to lay down specific **provisions for arms control and demilitarisation**.


 "Space technology is an example of what security will mean for any strong nation in the future."



- Norms or treaties should take into account **evolving technologies and the ever increasing number of participatory nations** and, thus, be amenable to ongoing dialogue and **future negotiations**.
- **Global cooperation and coordination:** Global cooperative efforts in **SSA (space situational awareness), disaster mitigation, debris removal, scientific exploration and other space related fields** are needed.
  - It will contribute to transforming outlook towards space and ensure a **responsible and safe ecosystem** for space exploration.
- **Effective governance of space:** For effective governance of space and restoring its position as a global common, an effective **global governance system is needed**.
  - This would help not just in demilitarising space, but also help the issues like growing **space debris, decommissioning satellites, and even boost space exploration**.

WAY FORWARD FOR INDIA	
	<b>STRATEGIC ACTIONS</b> A well-defined <b>national space and defence space strategy</b> . Declaring a <b>space security doctrine</b> to spell out the conditions under which India will consider the <b>offensive and defensive use of space</b> .
	<b>OPERATIONAL ACTIONS</b> Re-organised <b>operating models</b> with industry bodies to allow free <b>flow of space technologies</b> across the military and civilian domains. Establish a <b>futuristic space station</b> for military and civilian research and application purposes.
	<b>ENABLERS</b> Pass the resolution on the draft Space Activities Bill and <b>draft new Remote Sensing Policy</b> . A <b>military-civil fusion mindset</b> across the <b>Armed Forces</b> to ensure collaboration and <b>increase technology integration</b> in space for defence services

### Conclusion

Need of the hour is a meaningful and enforceable **space law** that delivers immediate and significant **diplomatic, political and even economic consequences** for a state which **violates norms of responsible behaviour**.

## 4.2. ROLE OF COMMUNITY IN BORDER MANAGEMENT

### Why in news?

Prime Minister recently called **every village at the border as the first village** of the country and the people residing near the border as **country's strong guard**, thus highlighting role of **local population in border management**.

### Importance of Community engagement in border management

- **To ensure a secure and safe border:** It would help enhancing security and development of **orders** besides providing a **sense of belonging** to these people.
  - They are **the first in line** when **irregular events** take place at the border.
  - In addition, local communities can **identify the most vulnerable persons** as well as the **risk factors** in terms of safety and health.
- **Improved situational awareness:** Border communities hold **vast amounts of intimate knowledge** on the area, characteristics of the terrain etc.



- **Enhanced surveillance:** In the difficult areas like coasts, fishermen watch groups can be formed to **fill in large gaps existing in the surveillance cover** on a regular basis. They can **act as guides** to the Armed Forces.
  - **Indian Navy and Indian Coast Guard (ICG)** regularly conduct Community Interaction Programmes (CIPs) for fishermen in coastal villages wherein they are sensitised about safety and security issues.
- **To uphold human rights:** Community involvement in border management also helps in ensuring that **security responses do not compromise human rights or inhibit unduly the free movement** of goods and people.
- **Utilisation of community mechanisms:** Improved interaction with local populations would allow gradual development of a new **community-based policing approach** to border management.
  - Also, it will enhance the **utilisation of community mechanisms** for managing challenges and conflicts.
- **Others:**
  - Can help in building **mutual trust and confidence**.
  - Engaging communities is a **form of citizen engagement** that leads communities to contribute to their own protection while ensuring **respect towards the sovereignty** of the State.

### Challenges in engaging local communities in border management

- **Inadequate state capacity:** While ethnic homogeneity allows communities to engage across borders, State capacities to manage the process are notably weak as can be seen in
  - Poor or non-existent **border infrastructure**;
  - **Basic equipment** for transport, communications, and security control is **missing, or cannot be maintained**;
  - Law enforcement personnel are **badly paid and inadequately trained etc.**
- **Alienation of border communities:** India's border population in general quite often feel **dissatisfied, alienated and show hostile attitude** towards border security forces.
  - Such attitude is owing to the **restrictive nature of tasks** performed by forces, which is generally **against the interest of local population**.
  - For instance, prevention of smuggling activities lead to a perceived feeling that **authorities unnecessarily interfere in the means of livelihood** of local populace.
- **Communication gap:** In many areas, border personnel have **little communication with the local people** to prevent connivance with smugglers and other criminals.
  - Field leadership **keeps minimum contact** with the local villagers due to **lack of knowledge of local language** causing **conflict/distrust**.
  - Hence, a **communication gap exists** which is detrimental to a congenial working environment.
- **Border Fencing and Connected Problems:** The construction of the fencing has also **generated many differences** between the local villagers and border authorities. Access to the farmland across the fencing is **regulated**. Frequent frisking and **timely gate opening** are irritants to farmers.
- **Agitation approach:** Often, the **criminals with vested interests** work against border personnel and exploit the situation to their advantage. Local population, because of various reasons including hidden economic benefits and social pressure **comes in support of such vested interests**.
  - Criminals often ensure that such incidents result in a **confrontation between the border authorities and the public**.

#### Initiatives taken for border area development

- **Vibrant Villages Programme (VVP):** The programme envisages **coverage of border villages** on Northern border having **sparse population, limited connectivity and infrastructure**, which often get left out from the development gains.
  - **Convergence of existing schemes** is proposed under VVP.
- **Border Area Development Programme (BADP):** Implemented through the State Governments/UT Administrations in habitations **located within 0-10 kms** from the first habitation at international border in 16 States and 2 UTs.
  - Under BADP, the **annual action plans** of the States/UTs consisting of works related to village infrastructure like roads and bridges, health, education etc. are considered and approved.
- **Border Infrastructure and Management (BIM) Scheme:** BIM aims to strengthen the border infrastructure for improving **border management, policing and guarding the borders**.
- **Enhanced budgetary allocation for BRO:** Government of India in its Union Budget for FY 2022-23 has increased the **capital outlay for the Border Roads Organisation (BRO)**, by a record 40 percent, as compared to FY 2021-22.
  - BRO is not just contributing to **enhanced operational preparedness** but making a very significant contribution towards **socio-economic integration and development** of the regions.

- **Lacunae in mechanisms:** In many cases, cooperation between border communities and authorities already exists, but often in an **ad hoc and informal way**. This makes them **unreliable and slow**.

### Measures to integrate local communities in border management

- **Taking into account local characteristics: Frameworks based on the local characteristics** can be established to create a **climate of trust** between the authorities and the communities.
- **Improving understanding of border community:** The relationship between border authorities and border population should be viewed as a **management function**.
  - This can be achieved by providing adequate security, improving **basic amenities and living conditions** and assisting in **generating employment opportunities**.
  - Border authorities should also ensure a **strict adherence to code of conduct**, ethical standards of **discipline and integrity and attempts** on attitudinal changes.
- **Political will:** The relationship between border forces and local community can essentially **survive on Government support**.
  - To **replace the concept of 'border guarding' by 'border management'** at ground level, the responsibility has to be shared by the **Central as well as State Governments**.
  - Report of task force on border management (2001) recommended accelerated development of infrastructure along border, especially to wean the border population from illegal activities.
- **Improving the Community Relations ability of border personnel:** Some steps in this regard are:
  - Systematic reappraisal of the **grievance redressal mechanism** against the force personnel.
  - Learn **local language**, respect women folk, elderly persons and respect **local customs**.
  - Carrying out civic action programmes, sports activities, **judicious utilisation** of border population grant, etc.

## 4.3. NEWS IN SHORTS

### 4.3.1. DELHI DECLARATION

- UN Security Council (UNSC) Counter Terrorism Committee's (CTC) **special meeting held in India** ended with the adoption of **Delhi declaration**, which called for:
  - Issuing new set of **non-binding guiding principles in countering digital terrorism threat**.
  - **Counter terrorist exploitation of Information and Communications Technology** (like payment technologies and misuse of drones etc).
  - **Countering use of technologies for terrorist purposes**, while **respecting human rights** and fundamental freedoms.
  - **Deepen engagement with civil society**, including women's organizations, private-sector entities etc.
- **About CTC**
  - It was **established by UNSC resolution 1373** (2001) in the wake of the 11 September terrorist attacks in the United States.
  - It comprises **all 15 UNSC members**.
  - **Mandate:** Tasked with monitoring the implementation of **steps to enhance countries' legal and institutional counter-terrorism abilities**, at every level, locally and internationally.
    - These steps include, Criminalize the financing of terrorism, Suppress the provision of safe haven, Deny all forms of financial support for terrorist groups etc.




- **Under resolution 1535 (2004), Counter-Terrorism Committee Executive Directorate (CTED)** to assist the work of the CTC was established.

### 4.3.2. LIGHT COMBAT HELICOPTER (LCH)

- The Indian Air Force inducted the **indigenously developed** (by Hindustan Aeronautics Ltd.) **multi-role LCH-Prachand**. India has become the **seventh country to make attack helicopters**.
- **Only combat helicopter in the world** which can land and takeoff at an **altitude of 5,000 met**
- Equipped with a **countermeasure dispensing system** that protects it from enemy radars or infrared seekers of the enemy missiles.

#### Light Combat Helicopter (LCH)



<b>Range</b>		<b>550 km</b>
<b>Endurance</b>		<b>Over 3 hrs</b>
<b>Service ceiling (the maximum density altitude to which it can fly)</b>		<b>6.5 kilometres</b>



#### 4.3.3. C-295 TRANSPORT AIRCRAFT

- C295 aircraft is being built by the **Tata-Airbus consortium for Indian Air Force**.
  - It is the first project of its kind in which a **military aircraft will be manufactured in India by a private company**.
  - It is also **first time that C295 aircraft will be manufactured outside of Europe**.
- **About C-295 aircraft**
  - It is a **transport aircraft with 5 to 10-tonne capacity**.
  - It can be used for **quick reaction and paratropping of troops and cargo**.
  - It will **replace the IAF's ageing Avro-748 planes** (inducted in early 1960s.)

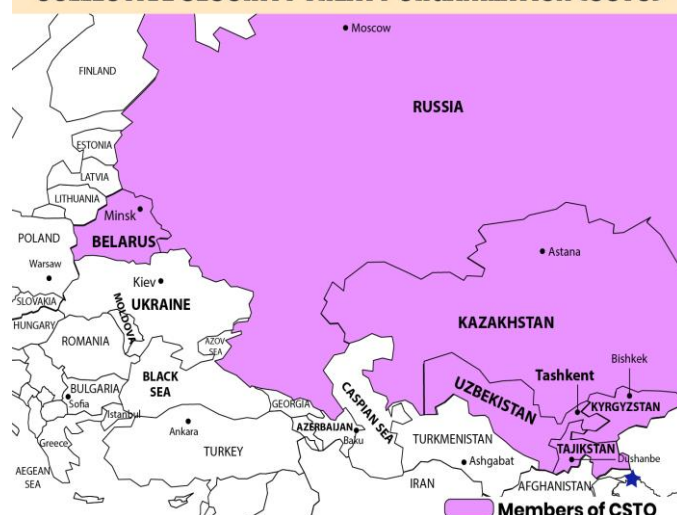
#### 4.3.4. DIRTY BOMB

- Russia has claimed that **Ukraine is planning to use a dirty bomb**.
- **Dirty Bomb is a bomb that contains radioactive material**, such as uranium, which is scattered through the air when its conventional explosive detonates.
- It **doesn't need to contain highly refined radioactive material**, as is used in a nuclear bomb.
- Instead, it uses radioactive materials from **hospitals, nuclear power stations or research laboratories**.
- This makes them **much cheaper and quicker to make** than nuclear weapons.

#### 4.3.5. COLLECTIVE SECURITY TREATY ORGANIZATION (CSTO)

- Kyrgyzstan has cancelled **Indestructible Brotherhood-2022 military exercises for Moscow-led CSTO** which was to be held in October in Kyrgyzstan.
- CSTO alliance is **loosely similar to NATO with its principle that an attack on one is an attack on all**.

#### COLLECTIVE SECURITY TREATY ORGANIZATION (CSTO)



#### 4.3.6. EXERCISE IN NEWS

- **Exercise Garuda-VII:** It is a bilateral exercise between **Indian Air Force (IAF) and French Air and Space Force (FASF)** at Air Force Station Jodhpur.
- **Simbex:** The Indian Navy is hosting the **Singapore-India Maritime Bilateral Exercise (SIMBEX)** at Visakhapatnam.
- **IMT TRILAT:** It is Indian Navy's maiden **Trilateral Exercise with Mozambique and Tanzania**.
- **Prasthan exercise:** An offshore security exercise conducted under aegis of Headquarters, Eastern Naval Command.
  - Conducted **every six months to integrate efforts of all maritime stakeholders** involved in offshore defence.
- **PowerEX:** Designed and conducted by CERT-In in collaboration with **Power-CSIRTs** (Computer Security Incident Response Teams in Power sector) for Power Sector Utilities.
- **IBSAMAR:** It is a joint multinational maritime exercise, among the **Indian, Brazilian and South Africa** navies.

# 5. ENVIRONMENT

## 5.1. MISSION LIFE (LIFESTYLE FOR ENVIRONMENT)

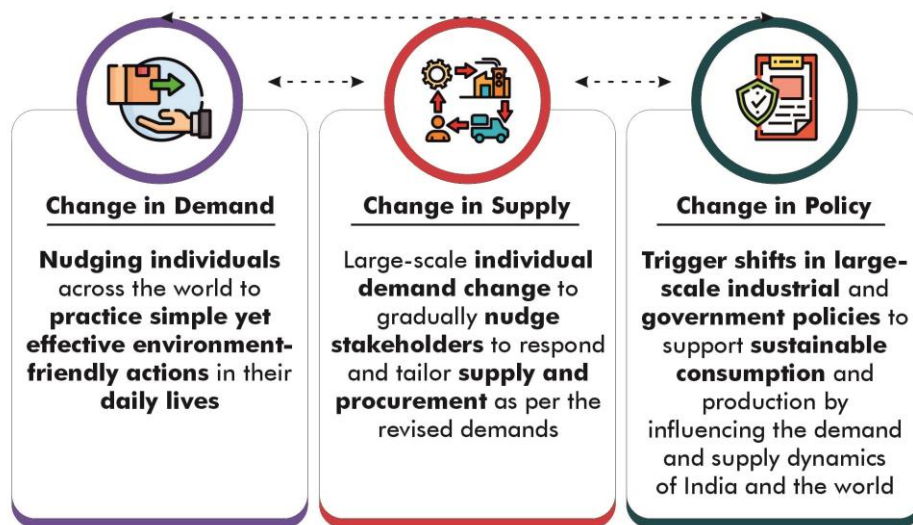
### Why in News?

Recently, the Prime Minister (PM) launched **Mission LIFE (Lifestyle for Environment)** at the **Statue of Unity** at Kevadia, Gujarat to protect the environment.

### About Mission LIFE: Objectives and Implementation

- **Mission LIFE** is an **India-led global mass movement** which aims to **nudge individual and collective action** to protect and preserve the environment.
  - Its concept was introduced by the PM at the **United Nations Framework Convention on Climate Change (UNFCCC) COP-26 (Conference of the Parties)** in **Glasgow**.
- **Objective:** Mobilise at least **1 billion Indians and other global citizens** to take individual and collective action for protecting and preserving the environment in the period **2022 to 2027**.
  - Within India, at least **80% of all villages** and **urban local bodies** are aimed to become **environment-friendly by 2028**.
- **Mission Duration:** It will run as a **5-year programme**, visualizing **three core shifts** in our collective approach towards sustainability (see **image**).
  - In 2022-23, the mission will focus on Phase I
- **Implementation:** **NITI Aayog** will curate and incubate **Mission LIFE** in the **first year**.
  - Subsequently, it will be implemented by the **Ministry of Environment, Forest and Climate Change (MoEFCC)** in a non-linear and non-sequential manner.

### Three phases of Mission LIFE Approach\*



\*\*\*-Each preceding phase will **organically feed into the next phase**. At the same time, **all phases are equally simultaneous** in nature. ★

### Need for Mission LIFE

- **Environmental degradation** and **climate change** is increasingly impacting ecosystems and people globally.
- According to the **IPCC (Intergovernmental Panel on Climate Change) Sixth Assessment Report**- human-caused global warming of **1.1°C** is increasingly impacting nature and people's lives everywhere despite adaptation efforts to it.
  - Without timely action, **800 million to 3 billion people** are projected to **experience chronic water scarcity** due to **droughts at 2°C warming**.
- Climate change is also the **biggest long-term risk** to the **global economy** and it could **lose up to 18% of GDP by 2050** if no mitigating actions are taken (as per Swiss Re Institute's Climate Economics Index stress-tests).
  - India's economy is **highly vulnerable** as it can cause significant damage to the **agriculture** and **tourism sector** which account around **18%** and **9%** of **total GDP**.

### Prospective actions for and Potential Benefits of Mission LIFE

- Launched in the **75<sup>th</sup> year of India's independence**, the Mission unveiled a list of 75 lifestyle practices that can promote climate-friendly behavior. Listed under **7 categories** (refer **image**), these actions are:
  - **Specific and measurable**,

- **Easy to practice** by individuals, communities, and institutions, with minimal supply-side dependencies, and
- **Non-disruptive to ongoing economic activity**, and, in fact, promoting economic activity in the foreseeable future.
- Helping to change individual and community behavior, it will have a significant impact on the **environmental and climate crises**. E.g.

- **Circular economy** can generate around **₹14 lakh crore** of additional cost savings by 2030;
- **Installing water-efficient fixtures** (taps and showers) can reduce water consumption by **30-40%**; and other benefits as highlighted in image.

  
**01**  
 ENERGY SAVED  
**19 Actions such as:**  
 Use of LED bulbs, Use of Public Transport etc.

  
**02**  
 WATER SAVED  
**15 Actions such as:**  
 Using drip irrigation systems, Creating Rainwater Harvesting Infrastructure etc.

- As per **United Nations Environment Programme (UNEP)**, if **1 out of 8 billion people** worldwide adopt **environment-friendly behaviours** in their daily lives, global carbon emissions could drop up to **20%**.

  
**03**  
 SINGLE USE OF PLASTIC REDUCED  
**11 Actions such as:**  
 Using cloth bag for shopping, Opt for bamboo toothbrushes etc.

LIST OF ACTIONS

  
**04**  
 SUSTAINABLE FOOD SYSTEM ADOPTED  
**6 Actions such as:**  
 Compost food waste at home, Prefer locally available and seasonal foods etc.

**Steps taken by India in line with the objectives of LiFE**

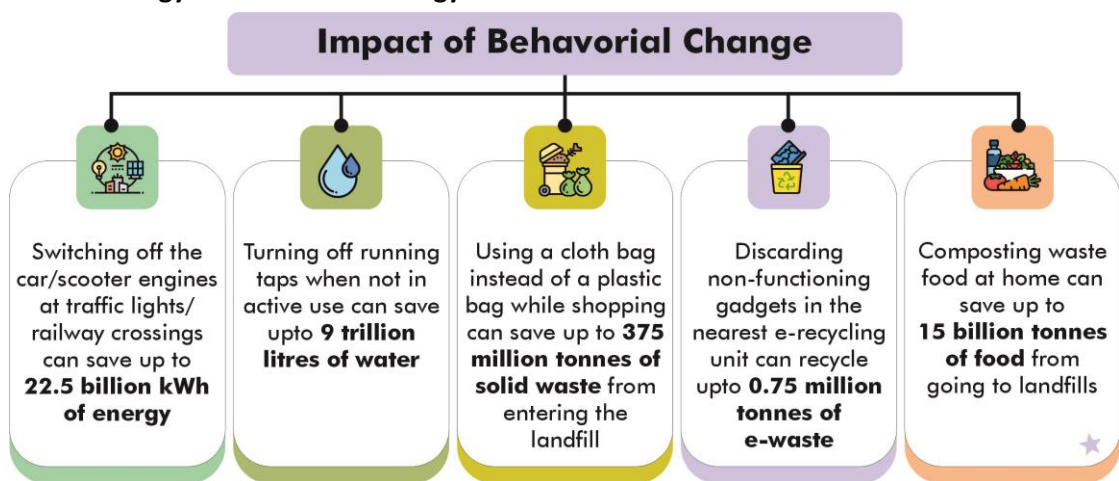
- **Individual-led programs** are started to address climate change, such as **Swachh Bharat Mission, GOBARdhan Scheme** and 'Give It Up' Campaign.
- India's **Renewable Energy (RE)** capacity is **4<sup>th</sup> largest** in the world, helping it to achieve the **Intended Nationally Determined Contribution (INDC)** of 40% electric capacity from non-fossil-fuel sources 9 years ahead of the **2030 deadline**.
  - India is ranked **4<sup>th</sup>** in **wind energy** and **5<sup>th</sup>** in **solar energy**.

  
**05**  
 WASTE REDUCED (SWACHHATA ACTIONS)  
**11 Actions such as:**  
 Donate old clothes and books, Repair, reuse and recycle old furniture etc.

  
**06**  
 HEALTHY LIFESTYLE ADOPTED  
**9 Actions such as:**  
 Plant trees to reduce pollution impact, Practice natural or organic farming etc.

  
**07**  
 E-WASTE REDUCED  
**4 Actions such as:**  
 Using rechargeable lithium cells, Repair and use electronic devices etc.

- Taking it forward, India has revised its INDCs and **Mission LiFE** is made part of it to combat climate change.



- It will also help India in its long-term goal of reaching **net-zero by 2070**.
- It will help the world in its fight against climate change and lead to a sustainable way of life to achieve the **sustainable development goals** as well.

Quantitatively, the eco-friendly lifestyle is visible through **lower average carbon footprint per person of India (1.8 tonnes per year)**, in comparison to the global average of **4.5 tonnes**).

Also, living in **harmony with nature** is part of **natural lifestyle in India**. For instance, **Day-to-day activities** such as – Use of clayware in cooking or tea in clay pots, Sun-drying of clothes; Plant based foods; plant-based biodegradable utensils etc.



## Way Forward: Sustainability through Mission LiFE

**Mission LiFE** encompasses every lifestyle related to the conservation of nature adopted by our ancestors and makes it part of today's lifestyle. It will help in connecting people power with global efforts to fight against the climate change **democratically**; inspiring people to **sync their lifestyle** with the resources available on earth and contribute to its protection by:

- Emboldening the spirit of the **P3 model**, i.e. **Pro Planet People**, as it is premised on the basic principles of 'Lifestyle of the planet, for the planet and by the planet'.
- Replacing the prevalent 'use-and-dispose' economy (mindless and destructive consumption) with 'circular economy' (mindful and deliberate utilization).
- **Leverage the strength of social networks** to influence social norms; contributing directly and indirectly to almost all the SDGs, especially **Sustainable Cities and Communities (SDG 11)**, **Responsible Consumption and Production (SDG 12)**, **Climate Action (SDG 13)**, **Life Below Water (SDG 14)** and **Life on Land (SDG 15)**.

## 5.2. MAINSTREAMING BIODIVERSITY IN FORESTRY

### Why in News?

The **Food and Agriculture Organization (FAO)** published a paper on forestry titled 'Mainstreaming Biodiversity in Forestry' in partnership with the **Center for International Forestry Research (CIFOR)**.

### Connection between Forests and Biodiversity

- Covering **31%** of the world's land surface, forests are the source of **fibre, fuel, food, and fodder** to over **1/3<sup>rd</sup>** of world population.
- They are home to almost **80% of terrestrial biodiversity** with over **50%** being accounted for by **tropical rainforests alone**.
- They serve as a **safety net for global beings**, helping **mitigate and adapt to climate change**, help in atmospheric carbon sequestration, natural disasters mitigation etc.
  - E.g. they store an estimated **296 gigatonnes of carbon**.

### About Mainstreaming Biodiversity in Forestry and its Approaches

**Mainstreaming biodiversity** refers to 'the process of embedding biodiversity considerations into policies, strategies and practices of key public and private actors to promote conservation and sustainable use of natural resources'.

- **Integrating biodiversity** concerns into everyday forest management practice and finding optimal outcomes **across multiple objectives**, including:
  - Productive economic benefits, maintaining or enhancing ecosystem services and biodiversity conservation.
- **Prioritizing forest policies, plans, programmes, projects and investments** with positive impact on biodiversity at the ecosystem, species and genetic levels.
  - **National Biodiversity Strategies and Action Plans (NBSAPs)** by countries are an important starting point for mainstreaming sector specific policies.
  - They can use various **approaches and instruments** for mainstreaming biodiversity in forestry for **Sustainable Forest Management** (see image).

### **Food and Agriculture Organization of the United Nations**

#### **GENESIS**

It is a **specialized agency** of the UN founded in **1945** (at **Quebec, Canada**) to **lead international efforts to defeat hunger**.

#### **GOAL**

To **achieve food security for all** and make sure that people have **regular access to enough high-quality food to lead active, healthy lives**

#### **HQ**

Rome, Italy

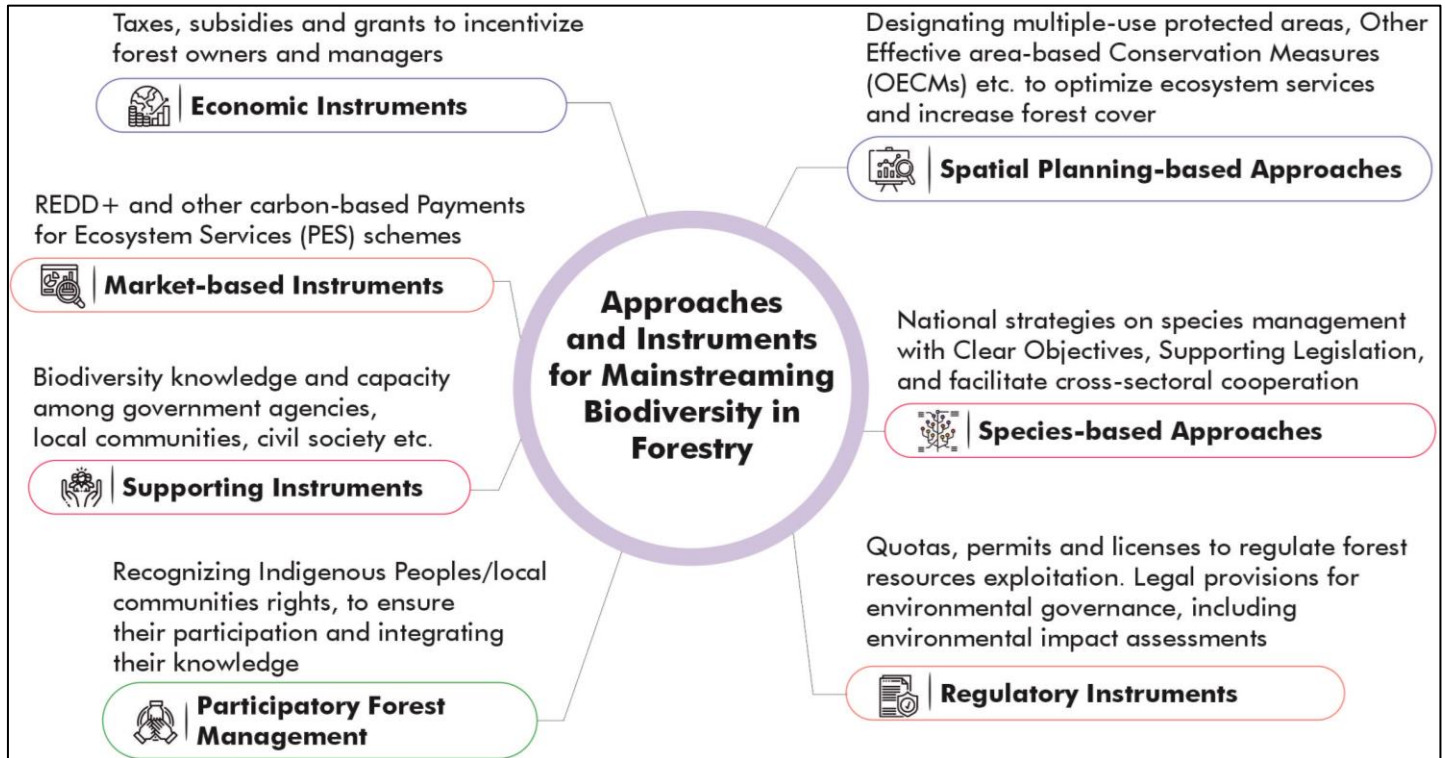
#### **MEMBERS**

- **195 members**
- **India is a founding member of FAO.**

#### **Center for International Forestry Research (CIFOR)**

- CIFOR is a **non-profit, scientific institution that conducts research** on the most pressing challenges of forest and landscape management around the world.
- It aims to **improve human well-being, protect the environment, and increase equity**.
- It conducts **innovative research, develop partners' capacity, and actively engage in dialogue** with all stakeholders to inform policies and practices that affect forests and people.

- Earlier, the **United Nations Strategic Plan for Forests 2017– 2030** recognized the role of forests in maintaining biodiversity.



### Barriers and Threats to Biodiversity Mainstreaming

- **Deforestation**: It is the **single most important driver of terrestrial biodiversity loss at an alarming rate**.
  - Approximately **10 million ha** of forest is converted to other land uses every year with agriculture expansion as the biggest reason.
    - ✓ Around **90% of deforestation** between **2000 and 2018** is attributable to **agriculture**.
  - Up to **30% of tree species** are now threatened with extinction. Depletion of vast forests threatens the **survival of wildlife species** as well.
- **Illegal Forest Activities and Corruption**: Illegal timber harvesting accounts for 15-30% global timber production and 50-90% of forest harvesting in tropical countries.
- **Low Profile of Conservation outside Protected Areas**: Biodiversity conservation outside protected areas often receives little attention despite being critical to stem biodiversity losses.
- **Insufficient Capacity, Financing and Regulatory Oversight**: Many developing countries struggle to enforce forest and biodiversity regulations because of insufficient capacity and resources, especially at sub-national levels.
- **Lack of Indigenous Peoples and Local Community Participation**: Insufficient consideration of Indigenous Peoples and Local Communities interests in national forest policy and in the development of forest management plan.
  - **Local communities and indigenous Peoples** own or manage nearly **1 billion hectares** of the world's forest and farm land.

### Way Forward for integrating Biodiversity in Forest Management

The quality of forest management has a critical role in determining the value of production forests for a range of values, including biodiversity. Biodiversity conservation in production forest can be enhanced through the following measures:

- **Assessing and Managing Risks of Forest Operations to Biodiversity** during planning and before initiating any major operations to mitigate identified risks.
- **Establishing and Managing Set-aside Areas** to protect old-growth forest and vulnerable habitats, as well as maintain habitat connectivity.
  - E.g. setting of 15% area as set-aside area within a managed forest.

- **Protecting Critical Biodiversity Resources** by retaining and protecting key biodiversity resources such as **rare plants, nest sites, large trees, hollow trees, dead wood** etc.
- **Sustainable Management of Timber Resources** as timber harvesting is a major threat affecting a huge number of tree species. Also, lowering the harvesting volume of timber with a longer rotation period could be a potential method.
- **Regulating Non-wood Forest Product (NWFP) Harvest**, including plant resources and animals, to ensure sustainability.
- **Sustainable Management of Forest Genetic Resources** to maintain and enhance genetic diversity of tree resources.
- **Managing and Controlling Invasive Species** through invasive species management plan, including the monitoring and eradication of invasive species.
- **Protecting Forests from Illegal and Unauthorized Activities** which is a major cause of biodiversity loss.

## Conclusion

**Mainstreaming biodiversity** in forest policy and management supports Sustainable Forest Management by **balancing conservation and sustainable use** of forest biodiversity. But its successful integration in forest management requires synergy of actions from **International, National and Local Stakeholders** to ensure necessary funding and knowledge support for everybody.

## 5.3. URBAN FLOODING

### Why in News?

Amid flooding in major metropolitans of India, the Centre highlighted the success of two cities- **Davanagere** (Karnataka) and **Agartala** (Tripura) - as cities which have **curbed urban flooding**.

### About Urban Flooding

- Urban Flooding is defined as **an excessive runoff in developed urban areas, where the stormwater doesn't have anywhere to go due to poor capacity of the drainage system, causing inundations**.
- It is a combination of **three aspects- Heavy Rain, developed surfaces and insufficient capacity of drains**.
- It is **significantly different from rural flooding** as the developed catchments of urban areas increase the **flood peaks from 1.8 to 8 times** and **flood volumes by up to 6 times**.

### Urban Flooding in India and its Causes

Urban flooding is a world-wide phenomenon but developing countries like India are more vulnerable to them. This is because of the greater presence of various **causes of urban floods** which can be divided into 3 parts-

- **Meteorological Factors:**
  - **Unprecedented Rainfall:** Indian cities witness heavy rainfall during south-west monsoons. E.g., the **average monthly rainfall of July in Mumbai is 868 mm** which is larger than average annual rainfall of many cities.
  - **Cyclone and Hurricanes:** Due to its large coastline, India is **exposed to 10% of the world's tropical cyclones**.
    - ✓ The development of coastal cities/towns exposes them to inland flooding and cyclonic storms storm surges caused by cyclones.
    - ✓ **Coastal Erosion**, i.e. wearing away the coastal land by sea, due to **natural and anthropogenic reasons**, adds to the flood risk.

### Impact of Urban Flooding

#### HUMAN SUFFERING IN TERMS OF



- Loss of life and livelihood, especially for lower income groups.
- Psychological impact due to loss of relatives, property etc.

#### HIGH ECONOMIC COSTS DUE TO



- Damage to properties, civic amenities, vital infrastructure.
- Disruption in transport and power.
- Loss of economic activities (e.g. tourism) and high recovery costs.

#### INCREASED EPIDEMICS RISK DUE TO



- Deterioration of water quality.
- Release of untreated sewage waste, hazardous chemicals and fuels from damaged treatment plants, production facilities or storage areas.

#### OTHER IMPACTS SUCH AS



- Damage to flora and fauna.
- Food shortages and Price rise.



- **Global Warming:** The climate change has led to changed weather patterns and increased episodes of high intensity rainfall events occurring in shorter periods of time which increases urban flooding risks.
- **Hydrological Factors:**
  - **Change in the Course of Rivers** due to restrictions in its flow.
  - **Reduced Water Retention Capacity** due to deforestation and Soil Erosion.
  - **Increased Extent of Impervious Surface** due to urbanization (rise in built up area).
  - **Decreasing Infiltration Rate** due to deforestation - increasing the flood risks as surface runoff becomes more than the infiltration rate during precipitation.
    - ✓ **Infiltration Rate** is the velocity or speed at which water enters into the soil. It depends on **soil texture** (size of soil particles) and **soil structure** (arrangement of soil particles).
- **Human (Anthropogenic) Factors:**
  - **Poor Urban Planning and Implementation** leading to inadequate stormwater drainage systems or settlements into areas without drainage infrastructure.
  - **Encroachments over natural drains and river floodplains**- decreasing the capacity of the natural drains while the flow of water has increased due to urbanization. E.g. in the **2020 Hyderabad flood** most people who died lived in lake beds.
    - ✓ This includes **disposal of solid waste** (domestic, commercial and industrial waste) and **dumping of construction debris** into the natural drains.
  - **Administrative issues** such as sudden release or failure to release water from dams. E.g. the **2015 Chennai flood** was caused by indiscriminate discharge of water from **Chembarambakkam Lake** (CAG report).
  - **Urban Heat Island effect** leading to an increase in rainfall over urban areas. E.g. **Bengaluru** is expected to receive **1,000 mm per annum rainfall** from current 650 mm per annum while its lakes and catchment areas have decreased.
    - ✓ **Urban Heat Island effect** is a phenomenon whereby cities experience higher air temperatures than the surrounding countryside.
    - ✓ When rain bearing clouds pass over such areas, the hot air pushes them up, resulting in highly localized rainfall which may sometimes be of high intensity.
  - **Illegal Mining of River Sand and Quartzite** for construction activities causing irreversible damage through reduced water retention capacity of water bodies.

### Measures taken to address Urban Flooding

- **Standard Operating Procedures (SOP)** for mitigating Urban Flooding by the Central Government under the **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**. It lays down **predefined set of directives or responsibilities** for **public agencies** in a city/town to in **3 phases**:
  - **Pre-Monsoon Phase:** Preparedness and Planning for Disaster Reduction.
  - **During Monsoon Phase:** Early Warning, Effective Response and Management, and Relief planning and execution.
  - **Post-Monsoon Phase:** Restoration and Rehabilitation.
- **National Guidelines on Management on Urban Flooding** by the **National Disaster Management Authority (NDMA)** with Ministry of Housing and Urban Affairs as Nodal Ministry for Urban Flooding.
  - It includes establishment of **Urban Flooding Cells** in the Ministry of Housing and Urban Affairs, State Nodal Departments and Urban Local Bodies (ULBs) along with other measures such as:
    - ✓ **GIS Platform Mapping** of all **Class I, II and III cities and towns**,
    - ✓ **Establishing Urban Flood Early Warning System**,
    - ✓ **Rainwater Harvesting as an integral component of the Building Utility**,
    - ✓ **Removal of Encroachments on Drains and in Floodplains etc.**
- **Uniform System of Alerts and Warnings** by the **Ministry of Home Affairs**- categorizing alerts in stages – **Yellow, Orange and Red**.
- **Sponge Cities Plan** by **ULBs and State Governments** to make cities more permeable so as to hold and use the water which falls upon it etc.

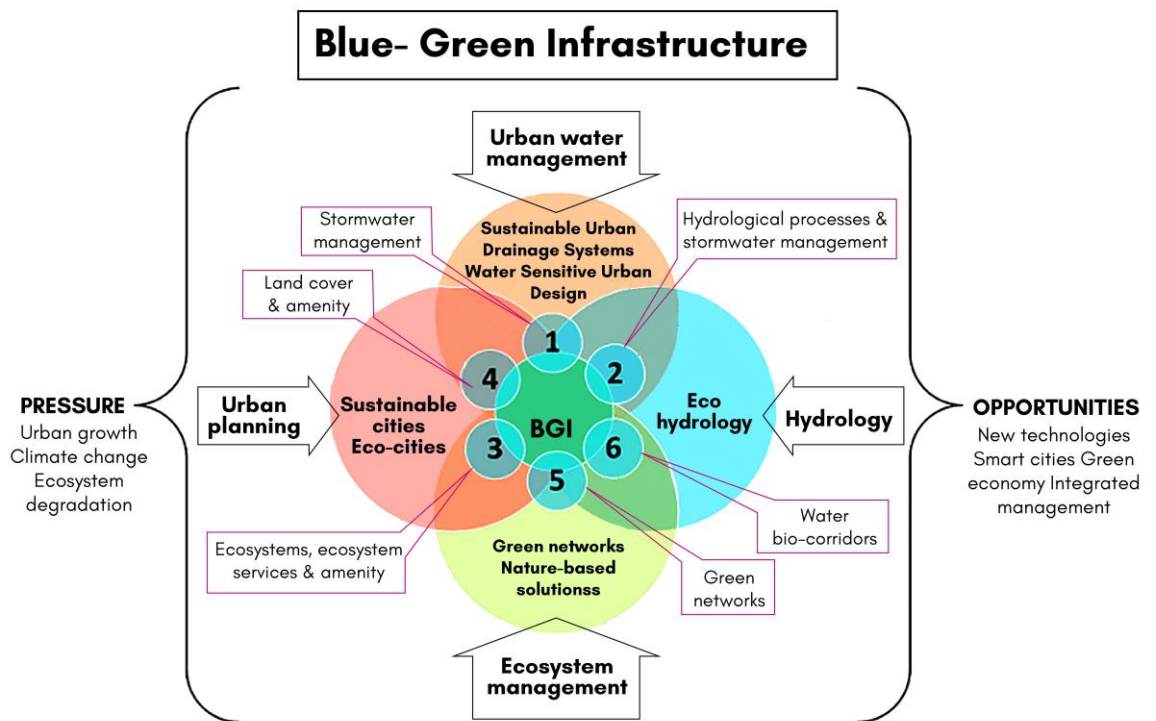
**Success of Davangere and Agartala: Steps Taken by Local Administration**

- **Mapping** of Existent Drainage Systems.
- **Removal of Illegal Encroachments** over drainage networks.
- **Construction of storm water drains** to curb water logging and ensure drainage of water after heavy rainfall within few hours.

## Further steps required to address it

- **Legal Support for Planned Development of Urban Areas**, i.e., regulating the built environment through Central, State and Local Building Bye Laws. This includes interventions:
  - **To stop terrain alteration** (flattening or altering drainage routes) from **builders, property owners, and public agencies** to avoid irreversible damage to city drains.
  - Bringing catchment areas of Rivers, lakes and other water channels under protected areas and include them in city development plans as part of **Blue-Green Infrastructure (BGI)** initiative.
    - ✓ BGI is an eco-friendly route to combat climate change and environmental degradation by **harnessing blue** (seas, rivers, lakes etc.) and **green** (trees, parks, forests, etc.) **elements** for flood resilient cities. **BGI** is part of Delhi's 2041 Master plan.
- **Efficient management of flood plains** by removing encroachments and building **Sponge Cities** as part of initiatives such as **AMRUT, National Heritage City Development and Augmentation Yojana (HRIDAY)** and **Smart Cities Mission**.
  - Sponge cities involve use of porous materials and technologies to improve the city's capacity to absorb rain water. E.g. Use of permeable material for roads and pavement, contiguous open green spaces, green roofs, etc.

- **Proper Design and Management of City's drainage systems** by replacing the antiquated stormwater drainage system with urban drainage systems



based on principle of hydraulics and needs of future. E.g. use of **bioswales to remove debris**, widening of drainage to accommodate higher flows of stormwater.

- **Proper operations and maintenance** of the system also requires **timely pre-monsoon desilting and removal of sediments**.
- **Early Flood Forecasting and Warning System** for reliable and accurate temporal and spatial data at the local level on real-time basis to avoid **sudden release of water** from upstream dams.
- **Involving Local Communities** in protection and management of wetlands to prevent and mitigate the flood risk.
  - It can help in upholding people with traditional rights for fishing and farming and ensure community support in rainwater harvesting.
- **Proper Disaster Preparedness and Response Planning** in terms of disaster resilient critical emergency and livelihood services, having an emergency drainage plan etc.

## 5.4. MAWMLUH CAVE

### Why in news?








Mawmluh Cave, in Meghalaya has been listed as one of the **'First 100 IUGS (International Union of Geological Sciences) Geological Sites'** in the world.

## About IUGS Geological Heritage Site

- According to IUGS, a Geological Heritage Site is a **key place with geological elements and/or processes of scientific international relevance**, used as a reference with a substantial contribution to the development of geological sciences through history.
- The designation of First 100 geological sites is done under **the project International Geoscience Programme (IGCP-731)**.
  - IGCP serves as a knowledge hub of UNESCO to **facilitate international scientific cooperation in the geosciences**.
- Under the list of first 100 sites, all kinds of geological sites like **tectonic, stratigraphical, sedimentological, petrological, mineralogical, hydrogeological paleontological, geomorphological** and those related to the history of geological sciences, are considered.



# International Union of Geological Sciences

 <b>What is it?</b> <p>One of the world's largest scientific organisations representing over a million geoscientists.</p>	 <b>Formation</b> <p>1961 with 121 members</p>	 <b>Headquarters</b> <p>Beijing</p>
 <b>Organisation Type</b> <p>International non-governmental organization</p>	 <b>Parent Organization</b> <p>International Science Council (ISC) that unites scientific bodies at various levels across the social and natural sciences.</p>	
 <b>Purpose</b> <ul style="list-style-type: none"><li>• Promotes and encourages the study of geological problems, especially those of world-wide significance.</li><li>• Supports and facilitates international and interdisciplinary cooperation in the Earth sciences.</li></ul>	 <b>Current Involvement</b> <p>IUGS is involved in a wide range of activities like identifying the problems of terrestrial and planetary geological processes, encouraging innovations to test new geological concepts, models and methodologies, among other things.</p>	

## About Mawmluh Cave

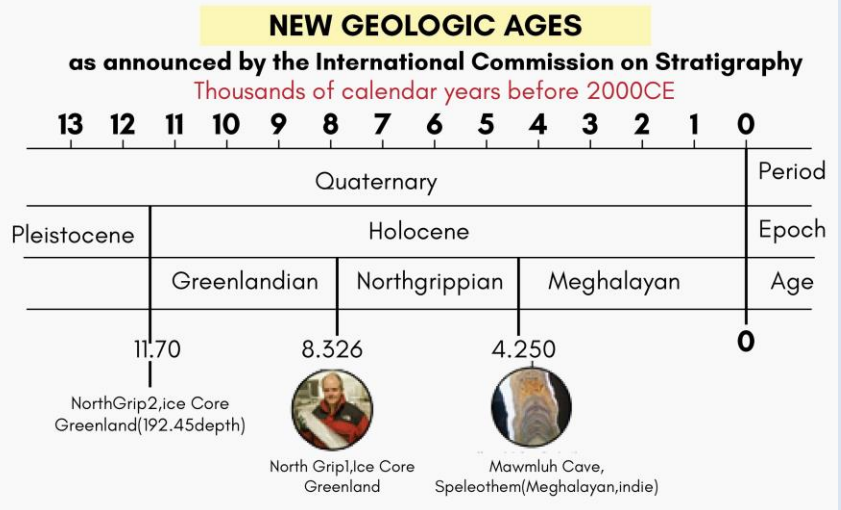
- Mawmluh Cave also known as **Krem Mawmluh**, is the **fourth longest cave** in the Indian subcontinent with a total length of seven kilometre of cave passages.
- Mawmluh Cave is located in **Sohra (well-known as Cherrapunji) of the East Khasi Hills District (Meghalaya)** and was first explored by a British official named **Lieutenant Yule in 1844**.
- Set at an altitude of 4503 m, the cave **belongs to the Meghalayan Age** and is famous **for its stalagmite** and other rock formations.
  - **Stalagmites are upward-growing mounds of mineral deposits** and are crucial for understanding the global climate system.
- There's a **deep pool inside the cave** which is formed by five different rivers that pass through the cave.

### Meghalayan Age

- It is the **most recent subdivision of the Holocene Epoch**, and began about 4,200 years ago, at a time when agricultural societies around the world experienced a very abrupt, critical and significant drought and cooling.
- It is unique among the many intervals of the Geologic Time Scale in that **its beginning coincides with a cultural event produced by a global climatic event**.
- It **resulted in the collapse of civilisations** in Egypt, Greece, Syria, Palestine, Mesopotamia, the Indus Valley, and the Yangtze River Valley.
- The **Holocene epoch (which started 11,700 years ago) falls under Cenozoic Era** and is the time after Ice Age.
  - Holocene itself can be subdivided, according to the International Commission on Stratigraphy (ICS) into **upper, middle and lower phases** (see infographic).



- Each subdivision of the Holocene Epoch is **marked out by sediments accumulated on sea floors**, lake bottoms, glacial ice and in stalactites and stalagmites across the world.



## 5.5. NEWS IN SHORTS

### 5.5.1. NATIONALLY DETERMINED CONTRIBUTIONS (NDC) SYNTHESIS REPORT, 2022 RELEASED BY UNFCCC

- It is second such report which is **an annual summary of climate commitments made by countries** and their impact on global greenhouse gas (GHG) emissions.
- These commitments, known as **NDCs**, were made by countries who signed on to the **Paris Agreement** to address climate change.
  - They **contain information on targets, and policies and measures** for reducing national emissions and on adapting to climate change impacts.
- The report analysed NDCs of **193 Parties** to the Paris Agreement, including **24 updated or new NDCs** submitted **after COP 26 (Glasgow)**.
  - Updated NDCs are manifestations of the Paris Agreement's '**ratcheting mechanism**'— wherein countries must **revise their pledges to be more ambitious** every five years.
- **Key Highlights of the report**
  - Countries are **bending the curve of global greenhouse gas emissions** downward but these efforts remain **insufficient to limit global temperature rise to 1.5 degrees Celsius** by the end of the century.
  - Cumulative CO<sub>2</sub> emissions in 2020-2030 would **likely use up 86% of the remaining carbon budget**.
  - Combined climate pledges could put the world on track for about **2.5°C of temperature rise by 2100, from a possible range of 2.1°C to 2.9°C**.

#### Related News

- **Another report was also released by the UNFCCC** which summarises 53 long-term emission reduction plans submitted by countries.

- These plans are known as **long-term low-emission development strategies (LT-LEDS)**.
- These plans **typically follow the announcement of a long-term target**, such as net zero emissions by 2050 or 2070.
- LT-LEDS are typically **broader in scope than NDCs and incorporate developmental goals** as well as required levels of investment and government expenditure.

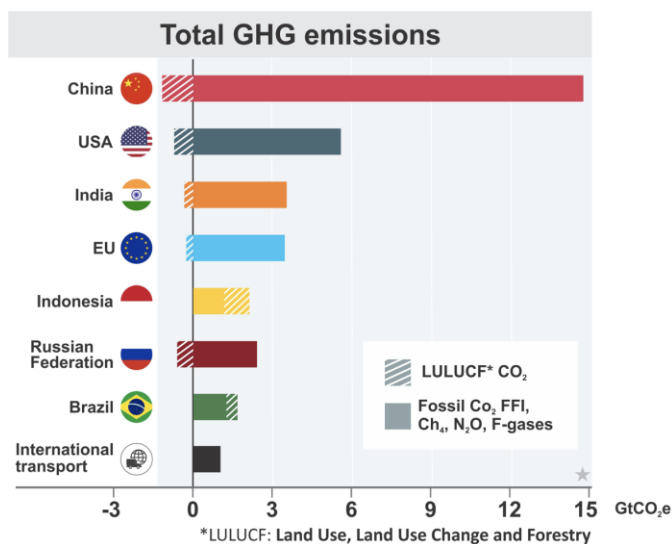
### 5.5.2. EMISSIONS GAP REPORT 2022

- The recently released 'Emissions Gap Report 2022: The Closing Window – Climate crisis calls for rapid transformation of societies' with a need to realign financial system to enable the achievement of the Paris Agreement.
  - Emissions Gap report is an annual report released by the **United Nations Environment Programme (UNEP)**.
  - It assesses the emission gap i.e., **the gap between the pledges taken by different countries to reduce greenhouse gas emissions and the estimated reduction required** to maintain the average global temperature rise to below 2°C, preferably 1.5°C, by the end of this century.

#### Key Findings of the report

- **High emission gap:** To get on track for limiting global warming to **below 2.0°C and 1.5°C, global greenhouse gas (GHG) emissions must be reduced by 30% and 45% respectively**, compared with current policy projections.
- **Nationally determined contribution (NDCs) are highly insufficient:** Policies currently in place with no additional action are projected to result in global warming of 2.8°C over the twenty-first century.
- **World average per capita GHG emissions** were 6.3 tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) in 2020.

- **India is the third largest GHG emitter, but its per capita emissions remains far below** the world average at 2.4 tCO<sub>2</sub>e.
- **Implementation gap:** Countries are off track to achieve even the globally highly insufficient NDCs.
- **Inequality:** The bottom 50% of households contribute 12% of the global total GHG emissions, whereas the top 1% emit contribute 17% of the total.



### 5.5.3. THE COLDEST YEAR OF THE REST OF THEIR LIVES REPORT

- **Released by:** United Nations Children’s Fund (UNICEF).
- **Key findings**
  - Around 624 million **children are exposed to one of three other high heat measures-** high heatwave duration, high heatwave severity or extreme high temperatures.
  - One in four children lives in areas where the average heatwave event **lasts 4.7 days or longer as of 2020.**
  - **Virtually every child on earth will face severe heatwaves** even with an estimated 1.7 degrees Celsius of warming in 2050.

### 5.5.4. STATE OF CLIMATE ACTION REPORT 2022

- **Released by:** Climate Action Tracker (an independent analytic group comprising Climate Analytics and New Climate Institute), the **United Nations High-Level Climate Change Champions, World Resources Institute** and others.
- It provides a **comprehensive assessment of the global gap** in climate action across the world’s highest-emitting systems.
- **Highlights:**

- Total global greenhouse gas emission in 2019 was **58.5 gigatonnes of CO<sub>2</sub> equivalent.**
- Getting on track to achieve 2030 targets will **require an enormous acceleration** in effort like Phasing out coal power generation 6 times faster.

### 5.5.5. CLIMATE TRANSPARENCY REPORT (CTR)

- The CTR provides a concise overview on the **state of climate performance of the G20.**
- **Key highlights**
  - G20 members are responsible for around three-quarters of global emissions. However, they are **still not taking the necessary level of accountability of action.**
    - ✓ **Six G20 members including India did not sign the global methane pledge.**
  - At 1.5°C, most **G20 members can expect water scarcity and prolonged periods of drought,** and less favorable agricultural conditions.
  - **India**
    - ✓ India lost **5.4% of its gross domestic product,** in the service, manufacturing, agriculture, and construction sectors **due to extreme heat in 2021.**
    - ✓ Several areas of **Hindukush Karakoram Himalaya, experienced reduced snowfall and glacial retreat.**
    - ✓ **Local precipitation is projected to increase 5.8% and labour productivity is projected to decline by 5%** from the reference period of 1986-2006 at 1.5°C of warming.
- **Key Recommendations:**
  - Increase the deployment of **renewable energy and create sustainable jobs**
  - Use **targeted support for poorer households** instead of expanding subsidies for all.
  - Expand **climate finance for zero-carbon investments** both domestically and through international cooperation.

### 5.5.6. WORLD ENERGY OUTLOOK

- Released annually by **International Energy Agency (IEA).**
- **Key findings:**
  - World is in the **midst of the first global energy crisis,** triggered by Russia's invasion of Ukraine.
  - India is likely to see **world's biggest rise in energy demand this decade,** with demand climbing **3 per cent annually.**
- Outlook projects **continued expansion in coal generation** (in absolute terms) in India, peaking around 2030.

### 5.5.7. GREENHOUSE GAS BULLETIN

- It is an annual report of the UN's **World Meteorological Organization (WMO)**.
  - WMO is the **specialised agency of the UN for meteorology** (weather and climate), **operational hydrology and related geophysical sciences**.
- **Key findings of 2022 report**
  - Atmospheric levels of the **3 main greenhouse gases warming our planet** - carbon dioxide, methane and nitrous oxide- all reached new record highs in 2021.
  - This is the result of both **biological and human-induced processes**.
  - Emissions will also increase by 10.6% by 2030 from 2010 levels.

### 5.5.8. STATE OF MANGROVES 2022

#### Why in News?

The **Global Mangrove Alliance** has released its **annual report, 'The State of the World's Mangroves 2022'**.

#### Status of Mangroves in India

- As per '**The State Forest Report 2021**' the **total mangrove cover in India was 4,992 sq km**, an increase of 17 sq Km as compared to 2019.
- **Top 5 State/UT with mangrove Cover: West Bengal, Gujarat, Andaman and Nicobar Islands, Andhra Pradesh and Maharashtra.**
  - Overall, 12 states/UTs have Mangrove Cover.
  - **Sunderbans**, spread across India and Bangladesh, is the **largest Mangrove Forest of the world**.

#### Global status of Mangrove Ecosystem

- Global Mangrove Extent is of **147,359 km<sup>2</sup>** (2020). It is higher than previous estimates of **136,000 km<sup>2</sup>** (for 2016) largely due to improved maps rather than real gains.
- The **rates of loss** have greatly diminished, with averaged losses over the last decade of just **66 km<sup>2</sup>** of all **mangroves per year** (**327 km<sup>2</sup>** between 1996 and 2010).

#### About Global Mangrove Alliance (GMA)

- The **GMA was launched in 2018** at the **World Ocean Summit** by **Conservation International (CI)**, the **International Union for Conservation of Nature (IUCN)**, **The Nature Conservancy (TNC)**, **Wetlands International**, and **World Wildlife Fund (WWF)**.
  - Today, the alliance includes **more than 30 organizations**.
  - Last year, it published the inaugural '**The State of the World's Mangroves 2021**'.

- **GMA Goal:** To increase the global area of mangrove habitat through conservation, restoration and equitable management.
  - This includes **supporting research, advocacy, education and practical projects** on the ground with **local and community partners** with focus on **3 key areas**:
    - ✓ **Halting Mangrove Loss;**
    - ✓ **Implementing science-based restoration;** and
    - ✓ **Building Awareness.**
- It runs a number of initiatives for Mangroves such as '**Mangroves for the Future**' (**MFF**) - a **unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development**.
  - MFF covers **Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam.**

### 5.5.9. LEAD POISONING

- According to a recent report, India bears world's highest health, economic burden due to lead poisoning.
- The report about lead poisoning was prepared **jointly by government think tank Niti Aayog and Council of Scientific & Industrial Research**.
  - Bihar, Uttar Pradesh, Madhya Pradesh, Jharkhand, Chhattisgarh and Andhra Pradesh had the **highest average blood lead levels**.
- **Sources of lead**
  - Lead (Pb) is a **naturally occurring toxic metal** found in the Earth's crust. Other sources include:
    - **Mining, smelting and refining industries** as primary contributors while unorganized sectors (e.g. scrap dealers) as **secondary contributors**.
    - **Household Products** such as **Cosmetic Products, Ayurveda medicines** etc.
    - Lead present in **printed circuit boards and batteries** due to unscientific recycling
    - **Potteries** (e.g. utensils and glazed ceramic wares), **water bodies** etc.
- **Health Impacts of Lead**
  - Small exposure leads to causes symptoms like **headaches, nausea, irritability, tiredness and stomach ache**.
  - Large exposure **affects brain development**, especially in children and lowers IQ.
  - Lead exposure makes the **body susceptible to anaemia** as it prevents formation of haemoglobin.
  - **Premature Birth;** Reduced birth Weight and Slow growth in **newly-borns**.





### 5.5.12. EFFECTS OF LIGHT POLLUTION ON MIGRATORY BIRDS

- On World Migratory Bird Day (08 October), Light pollution and its impact on migratory birds has been highlighted.
- Light pollution refers to 'excessive, misdirected, or obtrusive artificial (usually outdoor) light'.
- Components of light pollution include:
  - Glare – excessive brightness that causes visual discomfort.
  - Skyglow – brightening of the night sky over inhabited areas.
  - Light trespass – light falling where it is not intended or needed.
  - Clutter – bright, confusing and excessive groupings of light sources
- Impact of Light Pollution: It washes out starlight in the night sky, interferes with astronomical research, disrupts ecosystems, has adverse health effects and wastes energy.
  - It is a serious threat to nocturnal wildlife, especially birds with impacts as given in image).
  - Also, it leads to disorientation among terrestrial animals such as Olive Ridley Sea turtles.
- Solutions to Light Pollution: Use of Light Shields or cut-off lights, Use of Warm lighting in place of cold lights, Use of Motion Sensors to turn on only lights only when motion etc.

**HOW DOES LIGHT POLLUTION IMPACT BIRDS AND PEOPLE?**

Light Pollution impacts an enormous diversity of birds that are active both nocturnally and diurnally.

<p><b>LIGHT-INDUCED COLLISION</b> Light Pollution contributes to the Death of millions of birds from collisions with buildings and other built infrastructure.</p>	<p><b>DISORIENTATION DURING FLIGHT</b> Light Pollution attracts and disorients birds flying at night, causing them to circle illuminated areas, depleting their energy reserves and putting them at risk of exhaustion, predation and lethal collision</p>
<p><b>DISRUPTION OF BIOLOGICAL RHYTHMS</b> Alter birds behaviors, including migration, foraging, and vocal communication, disrupting daily and annual biological cycles of birds.</p>	<p><b>DISRUPTION OF ECOSYSTEMS</b> Impacts not only birds, but also other animals and plants.</p>
<p><b>HARMS HUMAN HEALTH</b> More than 80% of the world's population lives under a "lit sky," Light Pollution harms human health and can contribute to sleep disorders, diabetes, and other problems.</p>	

### 5.5.13. ASSISTED NATURAL REGENERATION (ANR)

- A recent Conservation International report highlighted need for Assisted Natural Regeneration (ANR).
- ANR is a blend of active planting and passive restoration, where local people intervene to help trees and native vegetation naturally recover by eliminating barriers and threats to their growth,

### 5.5.10. GREEN CRACKERS

- Green crackers cause 30 per cent less air pollution as compared to traditional ones.
  - They reduce emissions substantially and absorb dust and don't contain hazardous elements like barium nitrate.
- There are three categories of green crackers:
  - SWAS - Safe Water Releaser.
  - STAR – Safe Thermite Cracker.
  - SAFAL – Safe Minimal Aluminium
- These can be produced by licensed manufacturers, approved by CSIR.
  - Additionally, Petroleum and Explosives Safety Organisation is tasked with certifying that crackers are made without arsenic, mercury, and barium, and are not loud beyond a certain threshold.

### 5.5.11. COMPRESSED BIO-GAS (CBG)

- Union Minister of Petroleum and Natural Gas inaugurated Asia's largest CBG plant in Sangrur, Punjab.
- CBG is the compressed and purified bio-gas produced from waste/bio-mass sources like agricultural residue, cattle dung etc.
  - In 2018, the government launched the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme to establish the CBG production ecosystem.
- Benefits:
  - Reduce the problem of Stubble Burning and related carbon dioxide emissions.
  - Produce fermented organic manure for organic farming.
  - Generate employment and additional income for farmers.

leaning on their knowledge of the land and on ancestral traditions.

- **For instance**, to prevent the spread of wildfires, people can build firebreaks and clear the forest floor of dry debris; to give native trees enough room to grow, invasive grasses and shrubs can be removed.
- **Advantages of ANR**
  - Trees and forests can be restored using ANR at **less than a third of the cost of tree planting, based on WRI estimates.**
  - Can restore much more land, much **more quickly**, as it requires very **little human intervention.**
  - ANR can **ensure that restored land effectively mimics native habitat** of local plants and wildlife.
  - Can **create jobs and bring income to landholders**, as they play role in protecting the new recovery by building fences, patrolling for fires, monitoring progress etc.
  - Plays a **critical role in achieving global goals**, including Paris Climate Agreement, Bonn Challenge (restore 350 million hectares of degraded and deforested lands by 2030).

#### 5.5.14. IUCN GLOBAL ECOSYSTEM TYPOLOGY

- It is **hierarchical classification framework** for classifying and mapping all Earth's ecosystems, integrating their **functional and compositional features.**
- This allows for **help identify ecosystems that are most critical for biodiversity conservation**, research, management and human wellbeing into future.
- It **comprises six hierarchical levels.**
  - **Three upper levels** classify ecosystems based on their **functional characteristics.**
  - Three lower levels of classification **distinguish functionally similar ecosystems from one another based on compositional resemblance.**

#### 5.5.15. TIGER RELOCATION

- A Tiger was recently shifted from Ranthambore Tiger Reserve (RTR) to Sariska Tiger Reserve (STR).
- The **relocation of Tiger (T-113)** aims to **increase the tiger population** in STR as the majority of the male and female tigers in STR have aged.
  - It was done after **seeking permission from the National Conservation Tiger Authority (NTCA).**
  - NTCA is a **statutory body** under **Wildlife (Protection) Act, 1972.**
- **Relocation** is the relocation of tiger/s from one reserve to another to either reduce tiger population in a

reserve or boost population at another where it has reduced considerably.

- **Reintroduction** means establishing a tiger population in an area which was part of its historical range but from where it has gone locally extinct.
  - India's **first tiger reintroduction programme** happened at **STR** in **2008**- after tigers disappeared from it in **2005.**
- **Benefits**
  - To establish a viable, **free-ranging population** in the wild, where tigers have become locally extinct.
  - Enhance the **long-term survival of wild tigers** in a manner that they could potentially perform their ecological and evolutionary role.
  - **Boosts conservation efforts** and often, leads to local employment.
- **About Tigers**
  - **IUCN status:** Endangered.
  - Tigers are mostly **solitary, apart from associations between mother and offspring.**

#### About Two tiger reserves

Ranthambore Tiger Reserve	Sariska Tiger Reserve
<ul style="list-style-type: none"> <li>● Situated near <b>Aravali hills and Vindhya plateau.</b></li> <li>● Famous for <b>diurnal tigers.</b></li> <li>● Enclosed by <b>Chambal River and Banas River</b> from the two sides.</li> <li>● Includes the mighty <b>Ranthambore Fort, Jogi Mahal, Rajbagh ruins</b> along with many lakes like <b>Padam Talao, Malik Talao, Raj Bagh Talao.</b></li> <li>● <b>Species:</b> Tigers, Leopards, Striped Hyenas, Sambar deer, Chital, Nilgai, etc.</li> </ul>	<ul style="list-style-type: none"> <li>● The park is located in the <b>Alwar district of Rajasthan.</b></li> <li>● It is a <b>part of the Aravalli Range.</b></li> <li>● It also harbours <b>Neelkanth temple, built in the 6th century; Pandupol Hanuman Temple; Kankwadi fort.</b></li> <li>● <b>Species:</b> Indian leopard, jungle cat, caracal, striped hyena, golden jackal, etc.</li> </ul>

#### 5.5.16. KADAVUR SLENDER LORIS SANCTUARY

- India's first sanctuary for slender lorises was notified recently.
- Named **Kadavur Slender Loris Sanctuary**, it is in Tamil Nadu.
  - It is declared under **Wild Life (Protection) Act, 1972.**
- **Slender Lorises** are arboreal in nature i.e., spend most of their life on trees.
- They are the **primates that cannot jump.**
- **Diet: Insectivorous** and feeds on toxic insects' time on plants and benefits farmers.
- **Habitat:** tropical scrub and deciduous forests native.

- **There are two types:**
  - Grey Slender Loris: **found only in South India and small parts of Sri Lanka.** (IUCN- Near Threatened)
  - **Red Slender Loris:** found only in Sri Lanka. (IUCN- Endangered)
  - Protected under **Schedule 1** of Wildlife Protection act 1972.

### 5.5.17. SLOTH BEAR

- First World Sloth Bear Day on October 12, was observed **Ministry of Environment, Forests and Climate Change** and the **Central Zoo Authority.**
- Features of sloth bear
  - Identified by their very distinct **long, shaggy dark brown or black fur**, and distinct white V or Y shaped chest patch.
  - **Solitary creatures** and generally **nocturnal** in nature.
  - **Diet:** Omnivore
  - **Life span:** Up to 40 years.
  - **Habitat Range:** endemic to the Indian sub-continent with small populations in Nepal and Sri Lanka.
- **Conservation status**
  - Listed under **Schedule I** of (Wildlife Protection) Act, 1972.
- **Vulnerable on IUCN Red List.**

### 5.5.18. DURGAVATI TIGER RESERVE

- **Madhya Pradesh (MP)** Wildlife Board approved a **new reserve for tigers of Panna Tiger Reserve (PTR).**
  - **One-fourth of PTR will get submerged** due to **linking of Ken-Betwa rivers.**
  - In wake of river linking project, **NTCA had asked UP and MP governments to notify new tiger reserves.**
- **Durgavati Tiger Reserve** will spread across **Narisinghpur, Damoh and Sagar districts.**
- A **green corridor linking PTR with Durgavati will be developed** for the natural movement of the tiger to the new reserve.
- **Other tiger reserves in MP:** Kanha, Bandhavgarh, Panna, Pench, Satpura, Sanjay-Dubri.

### 5.5.19. MINING IN ARAVALLIS

- Report of a joint committee, formed by NGT to ascertain the extent of illegal mining in Aravalli has reported **mining activity at several locations in the region despite prohibitory orders.**
  - Mining of major and minor minerals in Aravalli hills in Faridabad, Gurugram and Mewat was **banned by the SC, first in 2002 and then in 2009.**

- This was banned to **restore the traditional ecological value of the hills.**
- Earlier, **CAG had also highlighted alarming level of Ecological degradation** in Aravallis.
- **Significance of Aravallis**
  - **Aquifer recharge:** Several water streams originate from Aravalli.
    - ✓ Also, with their natural cracks and fissures, they **function as NCR's most critical water recharge zone.**
  - **Climate:**
    - ✓ **During monsoons,** the mountain range guides the attenuated monsoon clouds eastwards, thus helping **nurture the sub-Himalayan rivers** and feeding the north Indian plains.
    - ✓ **In the winter months,** it protects the fertile alluvial river valleys (the para-Indus and Gangetic) **from the cold westerly winds from Central Asia.**
  - **Wildlife:** Aravalli are home to large number of wild species and with destruction, chances of man - animal conflict are rising.

#### About the Aravalli

- It is an almost 700km-long **mountain range that starts from Gujarat, travels through Rajasthan and Haryana** before finishing at Raisina hill, Delhi.
- They have been denuded over the past four decades **owing to mining, deforestation and over-exploitation of its fragile and ancient water channels.**

### 5.5.20. KOLAR FIELDS

- **Centre has decided to revive** gold mining at the **Kolar fields in Karnataka.**
  - Mining was shelved earlier because the extraction had become unviable.
- According to an official estimate, the **extracts from Kolar gold fields (KGF) mining** (gold and minerals like palladium and rhodium) **are likely to fetch a value worth ₹30,000 crore.**
- **Operated by the Bharat Gold Mines Limited (BGML),** a public sector undertaking, KGF was **one of the world's deepest gold mines** at a depth of 3,000 metres.

### 5.5.21. BLUE FLAG BEACHES

- The globally recognized **International eco-label "Blue Flag"**, has been accorded to two new beaches – **Minicoy Thundi Beach and Kadmat Beach-** both in **Lakshadweep.**
  - This takes the number of beaches certified under the **Blue Flag certification to 12.**



- **About Blue Flag tag or Blue Flag certification:**
  - Certification is awarded by the **Denmark-based non-profit Foundation for Environmental Education or FEE**.
  - The mission of Blue Flag is to **promote sustainability in the tourism sector**, through environmental education, environmental protection and **other sustainable development practices**.
  - It is awarded to **beaches, marinas and sustainable boating tourism operators**.
  - In order to qualify for the Blue Flag, a series of **stringent environmental, educational, safety, and accessibility criteria** must be met and maintained.
  - Award is based on compliance to **four main categories**:
    - ✓ Environmental Education and Information;
    - ✓ Water Quality;
    - ✓ Environmental Management;
    - ✓ Safety and Services.



### 5.5.22. WORLD GREEN CITY AWARD 2022



- Hyderabad city won the **overall 'World Green City Award 2022' and 'Living Green for Economic Recovery and Inclusive Growth' award**.
- The results are announced by **The International Association of Horticulture Producers**.

### 5.5.23. GLYPHOSATE

- Government has restricted use of **glyphosate except for Pest Control Operators**.
- **About Glyphosate**
  - It is a **non-selective herbicide** (it will kill most plants), used to clear all kind of weeds from agricultural fields.
  - It **prevents the plants from making certain proteins** that are needed for plant growth.
  - The major consumption is **done in orchards and plantation crops**.

### 5.5.24. NEW ISLAND IN PACIFIC OCEAN

- According to NASA's Earth Observatory, new island has formed in **South Pacific after an underwater volcano near Tonga (Home Reef) erupted**, oozing lava and expelling steam and water above surface.
  - Home Reef is **part of Tonga-Kermadec subduction zone**, where three tectonic plates smash into each other and create an active area for undersea volcanoes.
  - New land mass has **quickly grown from one to more than eight acres in size**.
  - Earlier, submarine volcanoes flared up in 1852, 1857, 1984 and 2006, producing new islands each time.
- **About Islands created by underwater volcanic activity**
  - **Process of formation-** Volcanic islands originate from **passive lava flows on seafloor**.
    - ✓ These **passive flows harden into rock** and build up the height of the underwater mountain over millions of years.
    - ✓ Eventually, some **volcanoes reach heights above seafloor** where lower pressure allows for explosive eruptions.
    - ✓ Submarine volcanoes that **do not reach sea level are called seamounts**.
    - ✓ According to NASA, Islands created by underwater volcanic activity **can exist for years, though they typically don't last long**.
  - **Volcanic island ecosystem-** Because they evolve in an isolated environment, many organisms are considered **endemic species**

 <p><b>SMART QUIZ</b></p>	<p>You can scan this QR code to practice the Smart Quiz of Environment at our open test online platform for testing your understanding and recalling of the concepts.</p>	
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# 6. SOCIAL ISSUES

## 6.1. NATIONAL CURRICULUM FRAMEWORK FOR FOUNDATIONAL STAGE

### Why in News?

Union Minister for Education and Skill Development launched the National Curriculum Framework for Foundational Stage.

### About National Curriculum Framework (NCF) for Foundational Stage

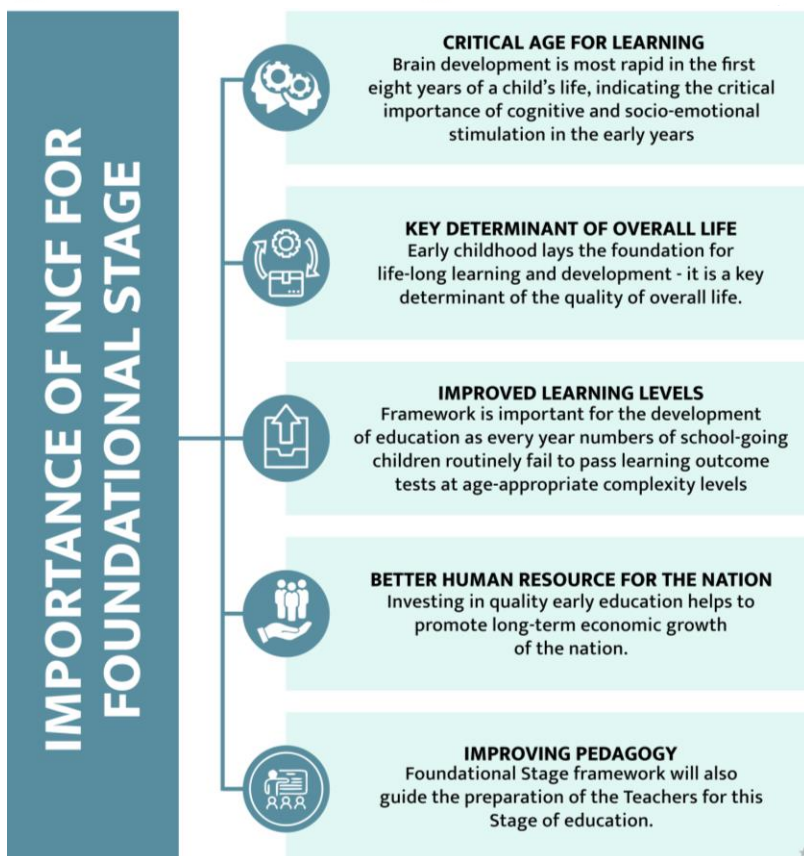
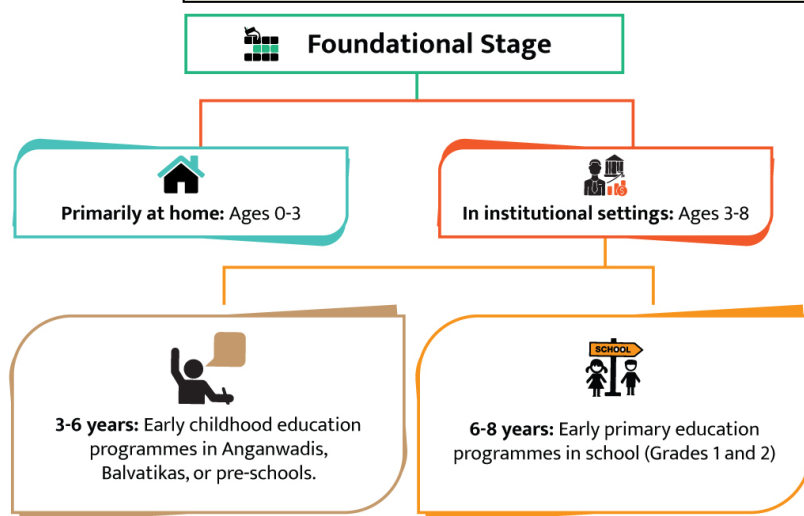
- As per the National Education Policy (NEP), 2020, following four NCFs will be developed
  - National Curriculum Framework for Early Childhood Care and Education (NCFECE)
  - National Curriculum Framework for School Education (NCFSE)
  - National Curriculum Framework for Teacher Education (NCFTE)
  - National Curriculum Framework for Adult Education (NCFAE)
- NCF, under NCFECE, for foundational stage is the first ever integrated Curriculum Framework for children between ages 3-8 in India.
  - This is the first Stage in the 5+3+3+4 Curricular and Pedagogical restructuring of School Education and will be an integral part of the overall NCFECE, covering education for children up to the age of 18.
- Objective is to help in positively transforming the school education system as envisioned in NEP 2020, through corresponding positive changes in the curriculum including pedagogy.
- It will be the basis for all pedagogy adopted by schools, pre-schools and anganwadis for children studying between nursery and Class 2.
- It covers a raft of topics, ranging from curriculum goals, approach to language education and literacy, home-based learning, teaching styles, and methods of assessment.

### Key highlights of National Curriculum Framework for Foundational Stage

- Importance to mother tongue:** Students should be taught exclusively in their mother tongue until the age of eight because introducing a new language at an early age reverses the entire learning process.

### About Curriculum

- Curriculum refers to the entirety of the organised experience of students in any institutional setting towards educational aims and objectives.
- It includes goals and objectives, syllabi, content to be taught and learnt, pedagogical practices and assessment, teaching-learning materials, school and classroom practices, learning environment and culture of the institution, and more.



- **Less burden on children:** For ages three to six, there should not be any prescribed textbooks for the children, and instead NCF recommended simple worksheets for curricular goals and pedagogical needs.

- **Ethics component:** Introducing an ethics component into the curriculum early on to build character, lead productive and happy lives, and contribute positively to society.

- **Learning through play:** It includes all activities that are fun and engaging to the child and can take the form of physical play, interaction, conversation, storytelling, riddles, rhymes, toys, visual art, music etc.

- **Gender balance:** Balanced gender and community representation through use of stories, characters, and pictures, must be ensured, books need to be attractive and should grab the attention of young children.

- **Avoid stereotypes:** Avoid promotion of stereotypes in textbooks such as owls and snakes as evil, or dark-skinned people as scary, or the mother always handling the kitchen.

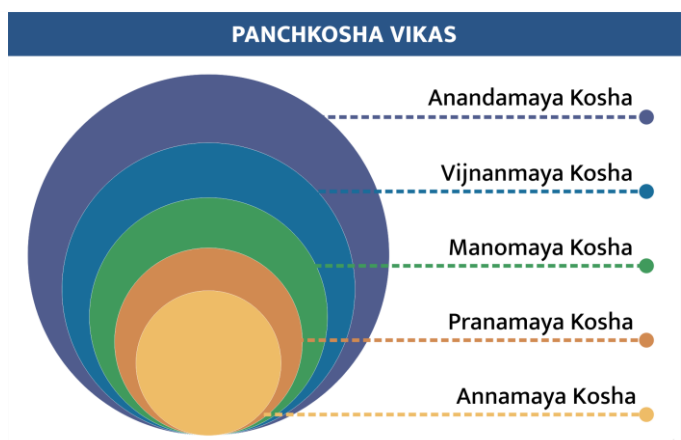
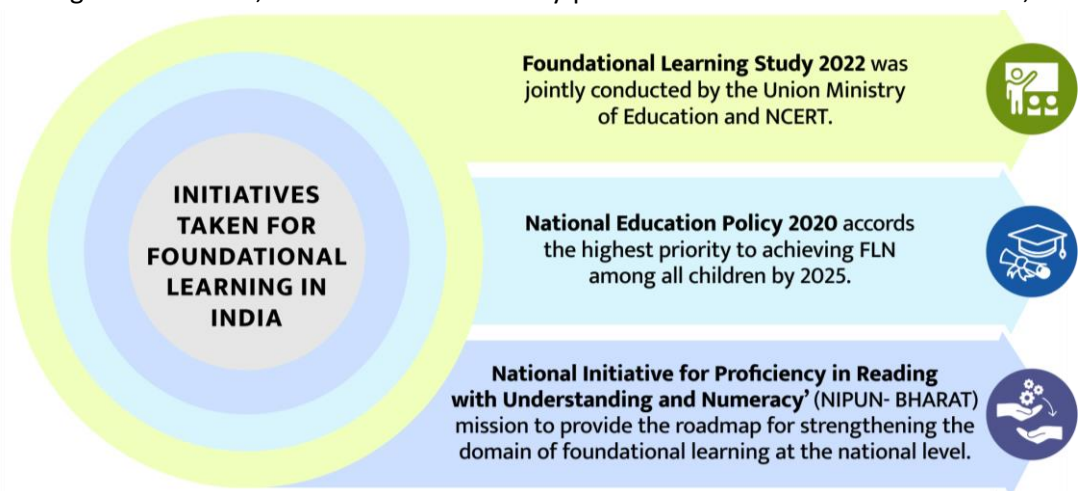
- **Better learning environment:** It needs to be well lit and well ventilated, inclusive, balance of both familiar and novel experiences for the child, include displays of children's work etc.

- **Panchakosha system for education:** The framework has listed the 'panchakosha' concept for children's education.
  - It comprising **physical development** (sharirik vikas), **development of life energy** (pranik vikas), **emotional and mental development** (manasik vikas), **intellectual development** (bauddhik vikas) and **spiritual development** (chaitsik vikas).
  - The Panchakosha description is in the **Taittiriya Upanishad**.

### Conclusion

Just as we would not build a house without solid foundations, we cannot expect a child to thrive without solid foundational skills.

This curriculum framework aims to help change practices in education and not just ideas, that will enable positive transformation of overall learning experiences for students and building a better foundation for them.





## 6.2. NATIONAL CREDIT FRAMEWORK

### Why in news?

Union Minister of Education launched the draft of National Credit Framework (NCrF) for public consultation.

### Background

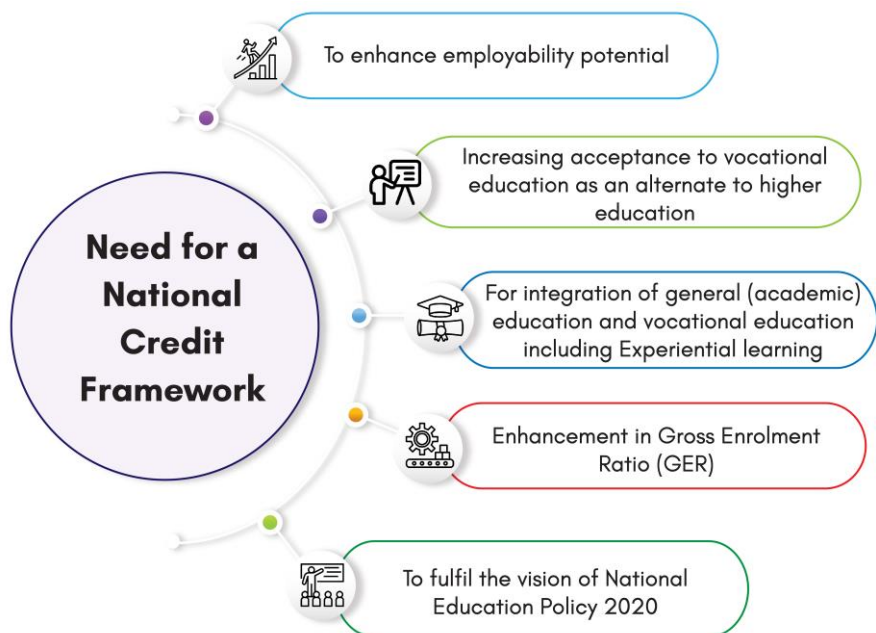
- **National Education Policy (NEP) 2020, lays emphasis on of making the education more holistic and effective by:**
  - Integration of general (academic) and vocational education.
  - Ensuring the vertical and horizontal mobility of students and learners between academic and vocational streams.
- To realise objectives of NEP 2020, **Government of India has approved a High-Level Committee (2021)** to develop a National Credit Accumulation and Transfer Framework for both General and Vocational Education and Training/skilling.
- **NCrF has been jointly developed by a High-Level Committee** with members from UGC, AICTE, CBSE, NCERT, Ministry of Education, Ministry of Skill Development etc.

### About Credits System

- **Credits quantify learning outcomes** corresponding to a qualification at a given level, that are subject to valid, reliable methods of assessment.
- In a credit-based education system, a **stipulated amount of credits** based either on the number of hours of learning or student workload **are required to progress from one level to another**, subject to assessments such as examinations.
  - For instance, 20 credits are required to complete a semester along with passing exams.
- **Credit points give learners, employers, and institutions a means of describing and comparing the learning outcomes achieved.**

### About National Credit Framework (NCrF)

- NCrF, proposed as part of NEP 2022, is an **umbrella framework for skilling, re-skilling, up-skilling, accreditation and evaluation** in educational and skilling institutions and workforce.
- NCrF **seeks to integrate the credits earned** through school education, higher education and vocational & skill education **to ensure flexibility and mobility among them.**
  - It will **act as guidelines to be followed** by schools, colleges and universities **in adopting the credit system.**
- **NCrF will enable learners to earn credits** not just through classroom learning but through co-curriculars, extracurriculars, vocational, online or distance learning, recognition of prior learning etc.
- **Framework enables seamless integration and coordination across regulators and institutions** to enable broad based, multi-disciplinary, holistic education across sciences, social sciences, arts, humanities and sports.
- **NCrF would be only one credit framework** for higher education, school education and skill education and **shall encompass the qualification frameworks for:**
  - Higher Education i.e., National Higher Education Qualification Framework (NHEQF),
  - Vocational & skill education i.e., National Skills Qualification Framework (NSQF),
  - School Education i.e., National School Education Qualification Framework (NSEQF) also known as National Curricular Framework (NCF).



## Key Highlights of NCrf

- **Credit levels:** NCrf prescribes eight credit levels in schooling till higher education.
- **Uniformity:** Credits and credit levels will be assigned uniformly between different areas of learning, i.e. arts and sciences, vocational and academic streams, and curricular and extra-curricular.
- **Comprehensive credit framework:** The framework will seamlessly integrate the credits earned through school education, higher education and vocational and skill education by encompassing the National Higher Education Qualification Framework (NHEQF), National Skills Qualification Framework (NSQF) and National School Education Qualification Framework (NSEQF).
- **Academic Bank of Credits (ABC):** After an Aadhaar-enabled student registration, all the credits earned by a learner through all the forms, streams, and levels of learning would be stored digitally in ABC.
  - ABC was introduced earlier this year for higher education only to enable the transfer of credits across higher education institutions.
- **Multiple Entry and Exit Options:** Lifelong learning through multiple entry and exit Options as credit transfer mechanism will enable a student to enter, exit and re-enter the educational ecosystem at any point of time.
- **Credits Against Total Notional Hours:** The NCrf proposes the alignment of notional learning hours—the number of hours a student will spend to achieve a particular learning outcome across academic classes including preschool, school and higher education.
- **Prior learning:** It also supports educational acceleration for students with gifted learning abilities and recognition of prior learning for the workforce that has acquired knowledge and skills informally through the traditional family inheritance, work experience or other methods.

### Credits in Indian Context

- **School Education**
  - At present, there is no established credit mechanism for regular school education. However, under the open schooling system, the National Institute of Open Schooling (NIOS) follows the credit system.
- **Higher Education**
  - **Choice Based Credit System (CBCS):** Under CBCS, requirement for awarding a degree or diploma or certificate is prescribed in terms of number of credits to be earned by the students.
    - ✓ This framework is being implemented in several universities across States in India.
  - **Skill Assessment Matrix for Vocational Advancement of Youth (SAMVAY):** a credit framework for skill based vocational courses which was launched by Ministry of Education.
  - **UGC guidelines for providing skill-based education** under National Skill Qualification Framework (NSQF).
    - ✓ NSQF is a national competency-based skill framework to facilitate mobility both within vocational education and training/ skilling and between vocational education and training/ skilling and general education.

## Benefits of NCrf to Various Stakeholders

<b>Students</b>	<ul style="list-style-type: none"> <li>• <b>Flexibility</b> in the duration of study/ courses through provisions of multiple entries and exit/work options.</li> <li>• <b>Creditisation</b> of all learning hours, including academic, vocational and experiential learning.</li> <li>• <b>Establishing multidisciplinary</b> and holistic education with flexible curricula.</li> <li>• <b>Removing the hard distinction</b> between the education stream (arts, science, social sciences, commerce, etc).</li> <li>• <b>Enhancing the scope of core learning</b> to include foundational and cognitive both.</li> </ul>
<b>Institutions</b>	<ul style="list-style-type: none"> <li>• <b>Unification of higher education institutions</b> to promote multidisciplinary education, creating a diverse and rich students' knowledge base.</li> <li>• <b>Promoting stronger collaboration</b> between institutions.</li> <li>• Making <b>credit mechanism simpler and uniform.</b></li> <li>• Increasing <b>focus on research and innovation.</b></li> <li>• <b>Promoting digital learning,</b> blended learning, and open distance learning.</li> </ul>
<b>Government</b>	<ul style="list-style-type: none"> <li>• <b>Increase the enrolment of students,</b> helping to fulfil the national vision of complementing the demographic dividend and transforming India into the Skill Capital of the World.</li> <li>• Making <b>vocational education</b> and training/ skilling <b>aspirational.</b></li> <li>• Highly educated and <b>trained workforce</b> for Aatmnirbhar Bharat.</li> </ul>
<b>Industry</b>	<ul style="list-style-type: none"> <li>• <b>Allow students to attain NSQF-approved foundational skills</b> developed by industry and be more employable.</li> <li>• <b>Re-Skilling and up-skilling</b> of existing employees/ engineers.</li> <li>• Making students more employable by <b>enabling a more holistic design of the study.</b></li> <li>• <b>Creating a multi/ cross-sectoral skilled pool</b> of employable youth.</li> </ul>

## Conclusion

NCrF will enable this transformation by providing high quality education opportunities integrated with effective skills to reap the demographic dividend making education and skilling truly aspirational.

## 6.3. PROMOTION OF HIGHER EDUCATION IN REGIONAL LANGUAGES

### Why in News?

Recently, Union Minister of Home Affairs launched the Hindi version of MBBS course books in Madhya Pradesh.

### Development of Education in different mediums during British rule

- **East India Company faced an Orientalist-Anglicist challenge** regarding the medium of education that the company was to impart to local people in India.
  - **Orientalists** advocated Sanskrit, Arabic and Persian as the medium of education.
  - **Anglicists** advocated the imparting of western education through the medium of English.
- In this regard, **English triumphed as the main language**, supported by the Anglicists and Evangelists.
- **Macaulay's minute of 1835 batted for English education** and suggested downward filtration theory.
  - Aim was to impart modern education to a hand full of people who will spread the knowledge to the masses.
- **Wood's Despatch (1854) recommended primary education in vernacular languages** for the masses, **but secondary and higher education exclusively in English.**

### Significance of offering higher education programmes in regional languages

#### Reducing drop-out rates

Poor grasp of English has been tied by many educationists to dropout rates.



#### More inclusive higher education

Will be more helpful to the marginalised sections of society and first-generation learners.



#### Better learning outcomes

Performance in science and math, in particular, has been found to be better among students studying in their native language compared to English.



#### Local-global integration

It will equip students to solve local problems with a global mindset.



#### Better content for learning

It will bring the content in textbooks closer to students which will help them in understanding the concepts better.



#### Global examples

Countries like China, Japan and Germany have succeeded in a globalised world with English as language of communication.



### Post-Independence Development

- **Radhakrishnan Committee report of 1948-49**, known as Report of the University Education Commission, recommended that English be replaced by an Indian language as the medium of instruction for higher education as early as practicable.
- **Official Language Commission, 1956**, that made recommendations on the progressive use of the Hindi language for all official purposes of the Union.
- Later **Emotional Integration Committee (1962)**, **National Education Policies (1968, 1986)** also discussed about medium of instruction in higher education.

### Concerns related to promoting higher education in regional language

- **Availability of faculty for regional-medium courses:** Given the English-medium legacy of higher education in India, attracting and retaining quality teachers who are willing and able to teach in regional languages would be a challenge.
- **Difficulty in industry placements of graduates:** For instance, many public sector units accept Graduate Aptitude Test in Engineering (GATE, conducted in English) scores for entry-level positions.
- **Might impact global opportunities:** Delivering technical courses in regional languages may prevent students from competing in global labour and education markets, where fluency in English yields a distinct edge.



- **Challenge of many languages:** A regional language focus would not be meaningful in a scenario where an IIT Delhi or Madras sees entrants from across the country.
- **Initial Cost:** Initial investment in implementation can be high because of the additional cost of developing new learning material and trained teachers especially for languages that have not been standardised.

#### Way Forward

- **Build foundation first,** for instance, through grants to popularise science and technological education in the regional language, etc.
- **Hiring teachers with multilingual capabilities** including the English language compulsorily can effectively add to the internationalization of higher education.
- **Technological interventions** to serve as aids to teachers, and developing or translating enjoyable books into regional languages and making these available in colleges and digital libraries.
- **Incentives for teachers who know local languages** especially in areas with high dropout rates and an overhaul of the curriculum to make it more engaging and useful.

#### Initiatives taken to promote higher education in regional language

- **National Education Policy (NEP) 2022** urges universities to develop study material in regional languages.
- **All India Council of Technical Education (AICTE)** has approved several institutes across different states for offering **B.Tech degree programmes in regional languages.**
- **UGC is working with High-Powered Committee on Indian Language Development** established by the Ministry of Education to identify experts as well as 10-12 disciplines so that books could either be translated or written afresh
- **AICTE has launched an artificial intelligence-powered tool to translate books,** academic journals and videos.
- **Commission for Scientific and Technical Terminology (CSTT)** is providing **publication grant** towards the publications of University Level Books in regional languages.
- **Under National Translation Mission (NTM)** text books of various subjects prescribed in Universities and Colleges are being translated in all Languages of the 8<sup>th</sup> Schedule.

## 6.4. GENDER PAY PARITY

### Why in news?

Recently, Board of Control for Cricket in India (BCCI) announced a **“pay equity policy”** for its contracted women cricketers in the country.

### More on news

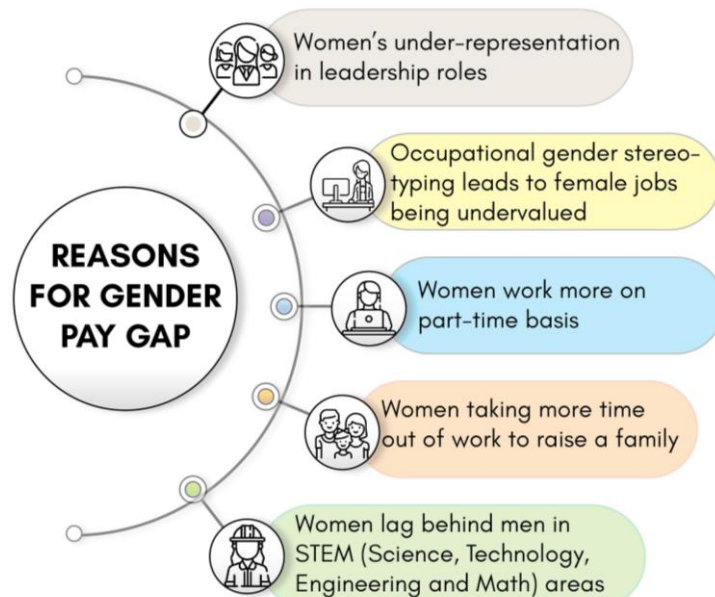
- The **match fee for both Men and Women Cricketers** will now be the **same from the BCCI.**
- With this, **India has become the second country** in international cricket to **implement equal pay for men and women players,** first being New Zealand.

### About Gender Pay Parity

- Pay parity means ensuring that **employees in the same job and location are paid fairly relative to one another,** regardless of their gender or ethnicity.
  - It is often used as an indicator of gender inequality in the world of work and is also used to monitor progress towards gender equality by nations and internationally.
- **Gender Pay Gap in India:**
  - India ranked **135 among a total of 146 countries** in the **Global Gender Gap Index 2022.**
  - Men in India capture 82% of labour income, while women earn just 18%, according to **World Inequality Report 2022.**

### What is the need for Gender Pay Parity?

- **Address Violence:** There is need of gender pay parity to address violence against women, ensure women’s independence and greater role in decision making.



- **Economic gain:** As per World Economic forum (WEF), Gender parity can **boost India's Gross Domestic Product**, thus help **achieve target of \$ 5 trillion economy** by 2026-2027.
  - Full and productive economic growth requires human-centred recovery from the pandemic, which will be made possible by **improving women's employment outcomes** and reducing the gender pay gap.
- **Reduce inequality:** As per Article 38(2) of Constitution, government should strive towards minimizing inequalities in income among individuals and Article 39 promises equal pay for equal work for both men and women.
- **Achieve Sustainable Development Goals (SDGs):** UN SDGs 8.5 sets the target of full and productive employment and decent work for all women and men, including for young people and persons with disabilities and equal pay for work of equal value by 2030.

#### Challenges associated with Gender pay parity

- **Prevalence of Informal Sector:** Women are highly concentrated in care giving work, informal work or in traditional jobs reserved for them which are low paying and further widens the pay gap.
- **Unpaid work:** Disproportionate time spent on unpaid work hinders women's ability to take up high remunerating jobs, thereby widening the pay gap.
  - As per National Statistical Office (NSO), Indian **woman spends 19.5% of her time in unpaid work**, while men spend about only 2.5%.
- **Lack of understanding:** Equal remuneration for **work of equal value is a challenging concept** for many enterprises to apply. This is because women are usually employed in jobs different to those of men.
- **Slow productivity growth:** Slow wage growth has become an obstacle to achieving sustainable economic growth, and it is also affecting efforts to reduce the gender pay gap.
- **Security:** Instances of workplace violence against women, sexual harassment etc. discourages women's participation in workforce.
- **Lack of support in Education:** Women in STEM educations faces issues like lack of role models, cultures that tend to exclude women, persistent stereotypes about women's intellectual abilities etc. which reinforce a wide gender gap.

#### Measures to address gender pay gap

- **Constitutional provisions:**
  - **Article 16:** All citizens have a right to equality of opportunity in relation to matters of public employment or appointment to any office under the state.
  - **Article 38(2):** strives to minimize inequalities in income among individuals.
  - **Article 39 (d):** Promises equal pay for equal work for both men and women.
- **Legislations**
  - Minimum Wages Act, 1948
  - Equal Remuneration Act, 1976,
  - Code on Wages, 2019.
  - Maternity Benefit (Amendment) Act, 2017
  - Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005
- **Equal Pay International Coalition (EPIC):** Led by **ILO, UN Women and OECD**, it is an initiative driven by stakeholders committed to **reduce gender pay gap and make equal pay for work of equal value** a reality across all countries and sectors.
  - It contributes to **achieve Sustainable Development Goals (SDGs) target 8.5 focusing on equal pay between women and men** for work of equal value.

#### Way forward

- **Raise the minimum wage:** Raising the minimum wage would have an immediate effect in terms of narrowing the gender pay gap and lifting women out of poverty.
- **Hire more women:** Recruiting and promoting women to leadership roles within companies helps to reduce the gender pay gap.
- **Encourage remote working:** Flexible working gives women the opportunity to handle caring or childcare responsibilities, as well as maintaining a career and an income. This is a crucial step towards helping to close the Gender Pay Gap for good.
- **Improve work-life balance:** According to the European Institute for Gender Equality, a better work-life balance could help to shrink the gender pay gap. Because women often take on additional responsibilities outside the workplace.
- **Gender pay audits:** Extend employer responsibilities to undertake compulsory gender pay audits and develop action plans to eradicate un- fair pay practices, with involvement from trade unions.
- **Awareness:** Equal pay for men and women needs to be promoted through awareness raising, combating gender-based stereotypes and advocating better sharing of family responsibilities.
- **Education:** Women should be **encouraged to undertake studies and pursue occupations in the areas of science, technology, engineering and mathematics (STEM)**, which offer better paid employment opportunities.

## 6.5. NUTRITIONAL SECURITY IN INDIA

### Why in News?

India has slipped to 107<sup>th</sup> position in the **Global Hunger Index (GHI) 2022** of 121 countries, from its 101<sup>st</sup> position in 2021.

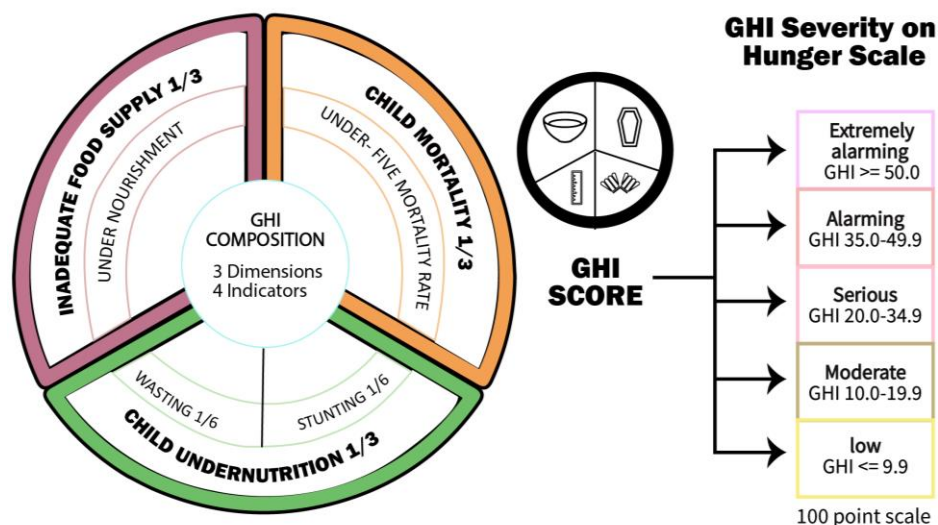
### About the Global Hunger Index

- Annually published by **Concern Worldwide and Welthungerhilfe**.
- It was first introduced in **2006**. The 2022 edition marks the **17<sup>th</sup>** edition of the GHI.

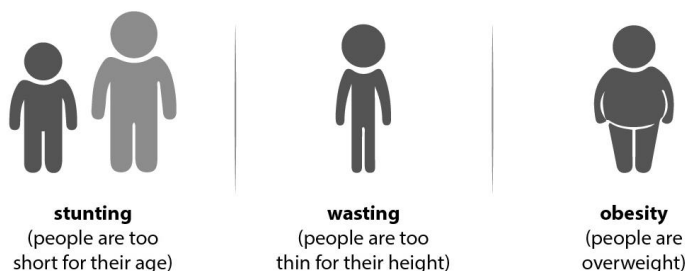
### Status of Nutritional Security in India

- Index Score:** With a score of 29.1, the GHI finds the level of hunger in India “serious”.
  - India’s GHI score has decreased from alarming (in 2000) to serious (in 2022).
- Child wasting:** The index says **child wasting** or the share of children under 5 years who have low weight for their height, indicating undernourishment in the country is 19.3%, **the highest in the world**.
- Undernourishment and stunting:** India’s proportion of undernourished in the population is considered to be at a **medium level**, and its under-five child mortality rate is considered **low**.
  - Child stunting has seen a “significant decrease” from 54.2% in 1998-1999 to 35.5% in 2019-2021, although it is still “considered very high”.
- Comparison:** India’s neighbours such as Nepal (81), Bangladesh (84), Pakistan (99) and Sri Lanka(64) have got higher rankings in GHI.

## GLOBAL HUNGER INDEX (GHI)



### MALNUTRITION COMES IN MANY FORMS



### Government of India Stand

- The Ministry of Women and Child Development** said that index is an erroneous measure of hunger and suffers from serious methodological issues.
- The methodology used is unscientific.** Government has highlighted that their assessment is on the results of a ‘four question’ opinion poll, was conducted telephonically and is unreliable.
- Estimate of Proportion of Undernourished (PoU)**, population is based on an opinion poll conducted on a very small sample size of 3000 based on “Food Insecurity Experience Scale (FIES)” Survey Module.

### Status of Nutritional Security in the world

- Stagnation in hunger reduction:** The 2022 GHI score for the world is 18.2, considered moderate, down slightly from the 2014 score of 19.1.
- Violent conflict:** According to the 2022 Global Report on Food Crises, conflict/insecurity was the main driver of acute food insecurity in 2021.
- Africa South of the Sahara and South Asia are the regions** with the highest hunger levels and are most vulnerable to future shocks and crises.
- The COVID-19 pandemic** has worsened the economic plight of low- and middle-income countries, slowing economic growth, driving up prices for goods and services, and increasing projected global poverty rates.
- Climate change** is putting stress on agriculture, forestry, fisheries, and aquaculture, increasingly impeding efforts to meet human needs.



## Reasons for the rising hunger and malnourishment

- **Poverty:** It restricts food choices and has been the causative factor of hunger-related deaths. According to the United Nations, about 28 % of the population is poor in India.
- **Multidimensional nature of hunger:**
  - **Hunger and related under-nutrition** is the **result of various associated factors** such as access to safe drinking water, sanitation, access to food items, etc. (including the issue of Hidden Hunger)
  - A person's '**nutritional quotient**' in India is also dependent upon **demographic factors** like gender, caste, age, etc. For instance, the nutritional needs of girl children and the elderly are not adequately addressed.
- **Ineffective implementation of schemes:** Studies suggest that less than 50% of the total allocated funds to the Integrated Child Development Services were utilised in 2018-19. (While only 14 states were able to spend the entire fund allocated to them under the Mid-Day Meal scheme.)
- **A decline in the Purchasing Power:** The farm income has remained stagnant in India and the job creation in manufacturing is not at par to subsume surplus labour.
  - This, along with the other structural issues like recession and rise in inflation due to the recent pandemic has impacted the purchasing power capacity of the poor.
- **Food Wastage:** As per FAO reports, nearly 40% of the food produced in India is wasted every year due to fragmented food systems and inefficient supply chains.

### Hidden Hunger in India

- It is a form of under-nutrition that occurs when **intake or absorption of vitamins and minerals is too low to sustain good health** despite getting adequate calories.
- In India as per the reports of UNICEF, **over 80 per cent adolescents suffer from "hidden hunger"**.

## Government Initiatives to remove Hunger

- **Poshan Abhiyaan:** The mission is a multi-ministerial initiative and aims at removing malnutrition from the country by 2022.
- **Eat Right India Movement:** It was launched by the Food Safety and Standard Authority of India (FSSAI) to transform the country's food system to ensure safe, healthy and sustainable food for all Indians.
- **Food Fortification:** Food Fortification or Food Enrichment is the addition of key vitamins and minerals such as iron, iodine, zinc, Vitamin A & D to staple foods such as rice, milk and salt to improve their nutritional content.
- **National Food Security Act, 2013:** It legally entitled up to 75% of the rural population and 50% of the urban population to receive subsidized food grains under the Targeted Public Distribution System.
- **Mid-Day Meal:** It aims to provide food to all the children enrolled in government-aided schools, local body schools, and special training centres.
- **Mission Indradhanush:** It targets children less than 2 years of age and pregnant women for immunization against 12 Vaccine-Preventable Diseases (VPD).

## Way forward

- **Supply chain management reforms:** Robust transportation infrastructure and cold storage will allow food to be efficiently transported. This would drastically improve access to food and also decrease food wastage.
- **Awareness:** General public awareness around the issue of food wastage should be made through various innovative channels like social media.
- **Transforming Agriculture:** Making agricultural systems to become **more efficient, sustainable, climate-smart and nutrition-sensitive by** training farmers.
- **Holistic approach:** Multisectoral approach with the inclusion of water, education, sanitation, agriculture, nutrition etc. should be undertaken by governments, civil societies and market forces.
- **Global Convergence:** Diverse stakeholders such as NGOs, academic institutions, and governments need to come together at the global level.
  - They could lead the drive to attain global nutrition targets, reduce income inequalities, and alleviate poverty with a keen focus on rolling out food security programmes.

## 6.6. DRUGS REGULATION ECOSYSTEM IN INDIA

### Why in News?

After a **World Health Organization (WHO)** alert on four India-made cough and cold syrups, the Drug Regulation Ecosystem in India has been under scrutiny.

### More on News

- These syrups have been ‘potentially linked with **acute kidney injuries** and over 66 deaths among children’ in **The Gambia**.
- These syrups were manufactured and exported by an **Indian company - Maiden Pharmaceutical Limited**.
- It **holds export only permission** for these products (Promethazine Oral Solution BP, Kofexnalin Baby Cough Syrup, MaKoff Baby Cough Syrup and MaGrip n Cold Syrup).
- The **preliminary enquiry** from **Central Drugs Standard Control Organisation (CDSCO)** has revealed that the manufacturer is licensed by the State Drug Controller for the products under reference.
- The tentative results on syrups have shown presence of **Diethylene Glycol (DEG)/ Ethylene Glycol**.
  - Present as impurities in **propylene glycol**, they are **toxic in nature**.
  - In India also, at least **five cases of DEG poisoning** have happened since **1972** including the 2020 incident in Jammu leading to death of 17 children.

#### Central Drugs Standard Control Organisation

- CDSCO (working under DGHS) is the **central drug authority** on production, distribution, sale and import of drugs in India.
- It regulates the quality, safety, and efficacy of drugs including vaccines.

### About India’s Drug Regulation Ecosystem

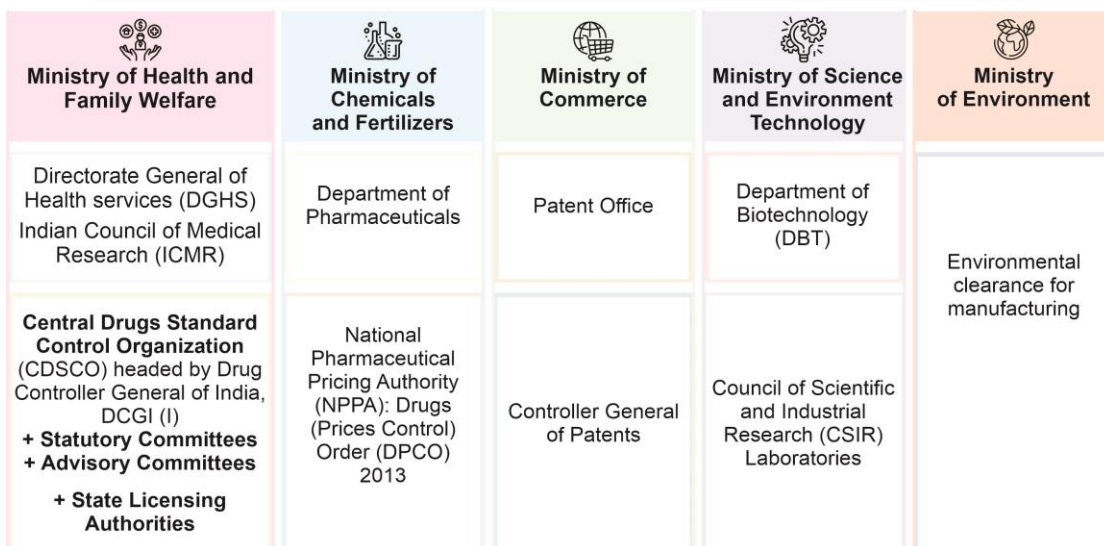
In most cases, patients lack the specialized knowledge required to identify whether drugs are **safe, genuine, and efficient** or **adulterated, spurious** and **substandard**. The Drug Regulation Ecosystem plays an important role by ensuring that only **safe, good quality and efficacious** drugs reach the patients.

- The **Indian Drug Regulatory System** originated from the

**Drugs & Cosmetics Act, 1940**. It regulates the **import, manufacture, distribution and sale of drugs and cosmetics**.

- The **1940 act** and its corresponding rules allow the **Centre and State** to regulate different aspects of the drugs ecosystem (see image on India’s regulatory environment).

### Regulatory environment for health products in India



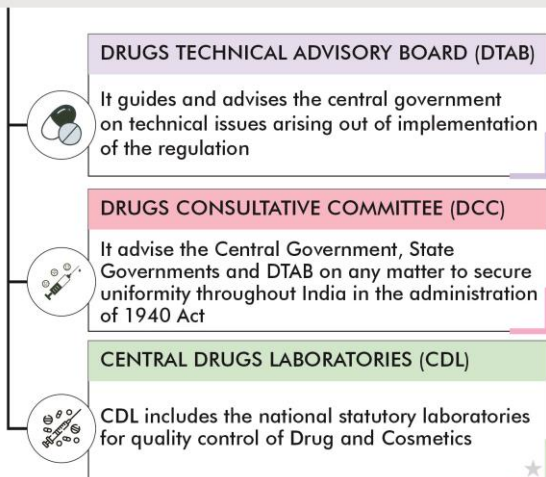
Main functions of the Central Government	Main functions of State Governments
<ul style="list-style-type: none"> <li>• Approval of new drugs</li> <li>• Registration and control of imported drugs</li> <li>• Approvals for clinical trials</li> <li>• Laying down standards for drugs, cosmetics, diagnostics, and devices</li> <li>• Coordinating activities of the states</li> </ul>	<ul style="list-style-type: none"> <li>• Licensing of manufacturing establishments and sale premises</li> <li>• Undertaking inspections of such premises to ensure compliance with license conditions</li> <li>• Drawing samples for testing and monitoring of quality of drugs</li> <li>• Taking actions like suspension/cancellation of licenses, surveillance over sale of spurious and adulterated drugs</li> </ul>

- The **1940 act** also provides for **other statutory bodies** for various functions (see image).

### What are the challenges in India's Drug Regulatory Ecosystem?

- **Unclear Distribution of Powers and Responsibilities:** The Centre and the States lack clearly codified distribution of powers and responsibilities.
  - For instance, with **Health** being a **State subject** under the **7<sup>th</sup> schedule of the Constitution**, states also exercise substantial drug regulation in addition to the provisions of the Act of 1940.
- **Lack of Independence and Autonomy:** Unlike other regulators, CDSCO is not a statutory body - leading to relatively lesser independence and autonomy.
  - Also, the **State Drug Regulatory Authorities (SDRAs)** are statutory bodies but they face issues of **lack of uniformity and proper demarcation of responsibilities**. E.g. they are often conjoined with the food regulation department.
- **Lack of Resources:** Indian drug regulation follows a **command-and-control architecture** where the regulator prescribes standards, distributes licenses, and then undertakes inspection to check for compliance.
  - While it provides **clarity in regulatory standards**, it also requires considerable investment in **human resources and physical infrastructure** to set standards, maintain records, conduct inspections, collect, and test samples, etc.
  - But CDSCO lacks access to resources required to ensure compliance of around **10,500 pharmaceutical manufacturing units of 3,000 drug companies** across the country.
  - The problem is **more acute** amongst **SDRAs**, leading to overworked workforce and inefficient administration.
- **Lack of Transparency:** The **regulatory decision-making** in India functions **behind closed doors**. In most cases, information sharing from the regulator is voluntary and incomplete.
- **Prevalence of Corruption:** Some CDSCO and SDRAs officials have been caught in the past by CBI for offences like accepting bribes for drug approval.

### Other Statutory Bodies



To strengthen the effectiveness of the regulatory system, a number of committees [**Mashelkar Committee (2003)**, **Ranjit Roy Chaudhury Committee (2014)** etc.] have been constituted in the past.

Recently, draft of 'The Drugs, Medical Devices and Cosmetics Bill, 2022' was also shared by the **Ministry of Health and Family Welfare**. But the ecosystem warrants dedicated, structural and holistic reforms.

### What can be done to overcome these challenges?

The **safety, quality and efficacy** of the medicines is critical in **building up faith** in India's pharmaceutical manufacturers as well as the health system and health professionals, **domestically** as well as **globally**. So, to ensure **people faith, good health and strengthen India's image** as 'Pharmacy of the World', following steps can be taken:

- **Build a streamlined Regulation System** which clearly demarcates the responsibilities of all the stakeholders and ensures effective coordination wherever needed.
  - It will help in **greater uniformity or harmonized** application of drug regulatory standards throughout the country.
- **Provide Statutory Recognition** to CDSCO to ensure regulatory independence and autonomy.
- **Building International Co-operation** to strengthen regulation and have more manufacturing units adhering to **Good Manufacturing Practices (GMP)** set by the WHO.
- **Allocate Sufficient Resources** for financial independence, and required physical infrastructure/human resources for effective regulation. E.g. implementing the **Mashelkar Committee formula** of one drug inspector per 50 manufacturing units and per 200 sales/distribution outlets.

**Good manufacturing practice (GMP)**

- It is a system to ensure that products are consistently produced and controlled as per quality standards.
- It helps in **ensuring therapeutic effect** and **boost pharmaceutical export opportunities** through international organization.
- Currently, around **2,000 manufacturing units** in India are **GMP certified**.



- **Ensure Transparent Regulatory Decision-making** for better compliance, consistency and trust among stakeholders.
- **Public Outreach**, both by CDSO and SDRAs for a proactive public engagement to address information asymmetry and participatory decision-making.
- **Use of Technology** to overcome resource constraints with other benefits such as digital databases, ease of licensing, etc.

## 6.7. NEWS IN SHORTS

### 6.7.1. RESULTS OF SWACHH SURVEKSHAN (SS) 2022 ANNOUNCED

- **Indore** ranked first under the Cities with more than 1 lakh population and **Madhya Pradesh** ranked first under category States with “more than 100 Urban Local Bodies”.
- The awards were given in ceremony hosted as part of **Swachh Bharat Mission-Urban (SBM-U) 2.0** by **Ministry of Housing & Urban Affairs (MoHUA)**.
- **About Swachh Survekshan**
  - It is the **world’s largest urban sanitation and cleanliness survey** conducted by **MoHUA** (under the ambit of the SBM-U) since 2016.
  - It **started out with the assessment of 73 cities**, Swachh Survekshan 2022 has managed to accomplish the **assessment of 4354 cities**.
  - SS 2022 emphasized on **End-to-End Digital monitoring, Swachh City Technology Challenge – Innovative Solutions from Citizens/Start-ups, etc., Gender & Social Inclusion, Covid-19 Response** with focus on **Municipal Frontline Workers, etc.**

- ✓ Direct observation
- ✓ Citizen feedback
- ✓ Service level progress

- Instituted by **Department of Drinking Water and Sanitation, Ministry of JalShakti** (under **SBM-Grameen**), since **2018**.
- **Telangana** topped under the **Large state category** and **A&N Islands** under **Small States & UT category**.

#### Related News

**Department of Drinking Water and Sanitation** also launched two campaigns:

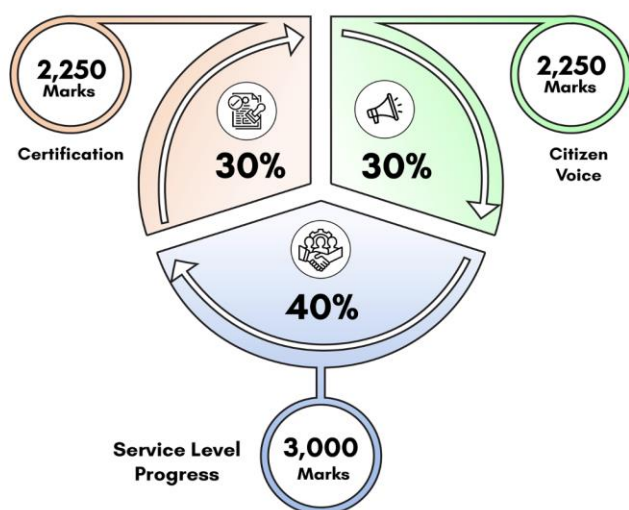
- **"Retrofit to Twin Pit Abhiyan"** for promoting twin pit toilets in households towards improved faecal sludge management.
- **'Swachh Jal Se Suraksha'**: to create awareness on the importance of clean and safe drinking water and also help to monitor the quality of water supplied in rural households.

### 6.7.2. BETI BACHAO BETI PADHAO (BBBP) SCHEME

- Ministry of Women and Child Development (MoWCD) has **revised its flagship 'BBBP' scheme** to include:
  - **Skilling of girls in non-traditional livelihood options** where women are historically under-represented.
  - **Increasing their enrolment in secondary education** particularly in STEM (Science, Technology, Engineering, Mathematics) subjects.
  - Raising **awareness about menstrual hygiene**.
  - Promulgating **elimination of child marriages**.
- Ministry also launched the **operational manual** to implement the scheme in districts. It contains:
  - **BBP activity calendar** for guided interventions.
  - **District Score Card** as special mechanism of performance ranking of districts
  - Expands the ministerial convergence beyond **Ministry of Education and Ministry of Health and Family Welfare** to other ministries like **Ministry of Skill and Development, Ministry of Youth Affairs and Sports, etc.**
- **About BBBP**
  - It was **launched in 2015** to address the declining **Child Sex Ratio** and related issues of women empowerment over a life-cycle continuum.

### Swachh Survekshan 2022 Weightage

Total Marks from 6,000 to 7,500



- **Swachh Survekshan Grameen (SSG) 2022** awards were also announced recently.
  - SSG is **annual national ranking of all districts and states of India** on the basis of following quantitative and qualitative sanitation parameters:

- Now, the scheme has been **revised** and implemented as a **component of the Sambal sub-scheme under Mission Shakti**.
- It has been **expanded to cover all the districts of the country**.
- There is no provision for DBT or creation of capital assets under it.

### 6.7.3. LEARNING LOSSES

- The Union Minister of Finance recently participated in a discussion on paper titled “**Learning Losses: What to do about the Heavy Cost of COVID on Children, Youth, and Future Productivity**”.
  - Learning losses due to school closures are one of the biggest global **threats to long-term recovery** from Covid-19.
- According to UNICEF such learning loss **could cost this generation of students close to \$17 trillion in lifetime earnings**
  - **In India**, according to 2021 National Achievement Survey **average performance of students had dropped to 9%** as compared 2017.
  - Also, **limited access to digital devices, low connectivity** severely constrained remote learning.
- **Key initiatives taken by India to overcome learning losses**
  - India undertook **National Foundation Learning Study** (based on Global proficiency Framework) for grade III students.
  - **Teach at the Right Level** where children are divided into instructional groups based on learning needs.
  - **Alternative Academic Calendar** containing week-wise plans covering syllabus-based learning outcomes.
  - **DIKSHA**, which has been identified as **one of the 12 Digital Global Goods by India** provides a QR coded textbooks to elementary school children.
  - **Vidyanjali 2.0** to connect volunteers with schools, **NISHTHA** for integrated teacher training etc.

### 6.7.4. YUVA 2.0 (YOUNG, UPCOMING AND VERSATILE AUTHORS) SCHEME

- **Ministry of Education** recently launched YUVA 2.0 scheme.

- It is an author mentorship programme to **train young and budding authors (below 30 years of age)**.
  - Its objective is to **promote reading, writing and book culture in the country, and project India and Indian writings globally**.
  - Under the scheme, **a total of 75 authors will be selected through an All India Contest**
  - **Implementing Agency:** National Book Trust (NBT).
- It is a **continuation of the first edition of YUVA** which witnessed participation from budding authors in 22 different Indian languages and English.

### 6.7.5. HUNGER HOTSPOTS REPORT

- It is **joint report by Food and Agriculture Organization and World Food Programme**.
- **Highlights**
  - Key hunger hotspots include, **Afghanistan, Ethiopia, Nigeria, South Sudan, Somalia, Yemen, countries in Horn of Africa etc.**
  - **222 million people in 53 countries/territories** are facing **Acute Food Insecurity**.
  - **Key Drivers and Aggravating Factors:** Conflict/insecurity, Displacement, Dry Conditions, Economic Shocks, Flood, Political Instability/unrest and Tropical cyclone.

### 6.7.6. GLOBAL STATUS REPORT ON PHYSICAL ACTIVITY 2022

- It is **published by the World Health Organization (WHO)**.
- It measures the extent to which **governments are implementing recommendations to increase physical activity across all ages and abilities**.
- **Key Findings**
  - **Less than 50% of countries have a national physical activity policy**, of which less than 40% are operational
  - **only just over 40% of countries have road design standards** that make walking and cycling safer.
- The report calls for countries to prioritize physical activity as **key to improving health and tackling NCDs**, integrate physical activity into all relevant policies, and develop tools, guidance and training to improve implementation.



**SMART QUIZ**

You can scan this QR code to practice the Smart Quiz of Environment at our open test online platform for testing your understanding and recalling of the concepts.



# 7. SCIENCE AND TECHNOLOGY

## 7.1. NOBEL PRIZE IN CHEMISTRY 2022

**Prize awarded for:** the development of click chemistry and bioorthogonal chemistry.

**Awardees:** The prize was given to **Carolyn R. Bertozzi (USA)**, **Morten Meldal (Denmark)** and **K. Barry Sharpless (USA)**.

### About Click Chemistry and Bioorthogonal Chemistry

- **K. Barry Sharpless** and **Morten Meldal** have laid the **foundation of click chemistry**- a branch of science in which molecular building blocks snap together quickly and efficiently.
  - **Click Chemistry** is defined as a set of powerful, selective, and modular blocks that work reliably in both small- and large-scale applications.
  - Instead of trying to make carbon atoms react with each other, **click chemistry focuses on using smaller molecules that already have a complete carbon frame.**
  - One such reaction is **copper-catalysed azide-alkyne cycloaddition (CuAAC)** that is now widely used medicinal chemistry (refer image).
- **Carolyn Bertozzi** developed **click reactions that work inside living organisms to map important but elusive biomolecules on the surface of cells called glycans.**
  - Also known as **Bioorthogonal reactions**, these reactions take place without disrupting the normal chemistry of the cell.

### Significance of the Work

The two concepts of **click chemistry** and **bioorthogonal chemistry** had a tremendous impact on Chemistry and its neighboring sciences in following ways-

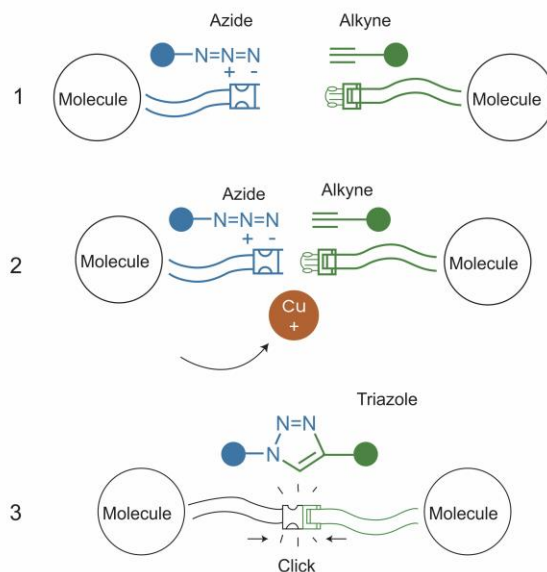
- **Development of enzyme inhibitors and receptor ligands, pharmaceuticals (anticancer agents, antimicrobials etc.), herbicides, photostabilizers, etc.**
- **Mapping of complex biological processes** like DNA and **creating unique materials.**
- Bioorthogonal Reactions are used **to explore how cells function** and **track biological processes.**
  - This has helped in **improved targeting of cancer pharmaceuticals.**

### Related Facts

- It was **2<sup>nd</sup> Nobel Prize in Chemistry** for **K Barry Sharpless**, who won his **first prize in 2001** “for his work on chirally catalyzed oxidation reactions”.
- He is the **fifth person** to receive the **Nobel Prize twice** after **Madam Curie, Linus Pauling, John Bardeen** and **Fredrick Sanger.**
  - The **International Committee of the Red Cross (ICRC)** has won it **three times** while **UNHCR, the UN Refugee Agency**, has won it **twice.**

### The Click Reaction that changed chemistry

Azides and alkynes react very efficiently when copper ions are added. This reaction is now used globally to link molecules together in a simple manner.



## 7.2. NOBEL PRIZE IN PHYSICS 2022

**Prize awarded for:** experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science.

**Awardees:** The prize was given to **Alain Aspect (France)**, **John F. Clauser (USA)** and **Anton Zeilinger (Austria)**.

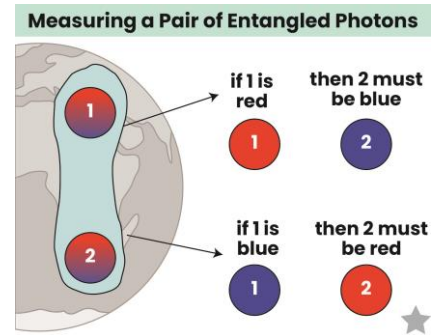
### About Quantum Technology

- **Quantum Technology** is based on **principles of Quantum mechanics** that describes **behavior of particles** — atoms, electrons, photons and almost everything in the molecular and sub-molecular realm.
- **2 basic principles** of quantum mechanics are:
  - **Quantum entanglement:** It explains **how two subatomic particles** can be **intimately linked** to each other.
  - **Quantum superposition:** It is a theory that subatomic particles exist in multiple states simultaneously.



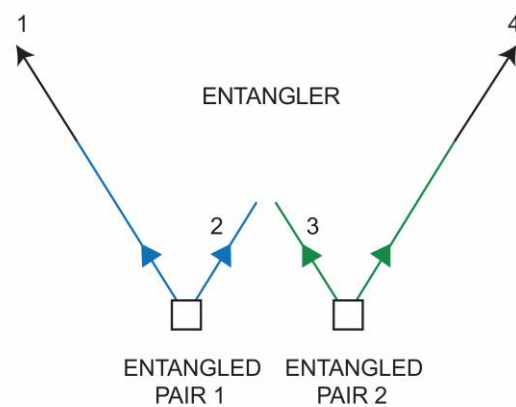
## About Quantum experiments and Bell inequalities

- They demonstrated the **potential to investigate and control particles** that are in **entangled states**, laying the foundation for a new era of **quantum technology**.
  - Entanglement** is when multiple objects – such as a pair of electrons or photons – share a single quantum state.
  - By **measuring the property of one particle** we can immediately determine the **result of an equivalent measurement** on the other particle, without any check (see image).
- They also demonstrated a phenomenon called **Quantum Teleportation** – a way of transferring an unknown quantum state from one particle to another.
  - Quantum Teleportation** is the only way to transfer quantum information from one system to another without losing any part of it.
  - It **uses features of entanglement** which can be used to **transport information**, carried by the object, to another place where the object is then reconstituted.
  - Anton Zeilinger** group also demonstrated **entanglement swapping**, i.e. two pairs of entangled particles that never met (see image).
- Another important part of their research was theoretical insight on **Bell inequalities**.
  - Bell inequalities make it possible to **differentiate between quantum mechanics' indeterminacy and an alternative description** using secret instructions, or hidden variables.



## Entangled particles that never met

- Two pairs of entangled particles 1 & 2, 3 & 4 are emitted from different sources.
- One particle from each pair (2 and 3) is brought together in a special way that entangles.
- The two other particles (1 and 4 in the diagram) are then also entangled.
- In this way, two particles that have never been in contact can become entangled.



# QUANTUM TELEPORTATION

or: WHAT HAPPENS TO "A" WILL AFFECT "B"



## Significance of the Work

- Entangled quantum states hold the potential for **new ways of storing, transferring and processing information**. Being at the **heart of quantum physics and quantum technologies**, it will have implications in:
  - Constructing** quantum computers,
  - Build** quantum networks, and
  - Establish secure quantum cryptography**, creating avenues for secure quantum encrypted communication.



- These experiments and other similar experiments lay the foundation for research in **Quantum Information Science (QIS)**.
  - QIS is an **interdisciplinary field that seeks to understand the analysis, processing, and transmission of information using quantum mechanics principles**.
  - It investigates several themes such as Quantum Information Theory, Quantum algorithms and complexity etc.

To know more about **Quantum Technology**, please refer to our following Weekly Focus Document.

 <p><b>Quantum Technology in India: Exploring the possibilities ahead</b></p>	<p>We are at the dawn of a new era, the age of quantum technology. A new generation of quantum technologies will cut across most of the emerging technologies we know today, empowering many of them while threatening the security of others. This document explains different aspects of quantum technologies, including the way they work, their inevitable impact at both the technological and social level, the actions governments and technology firms are taking to incorporate them into their programs and infrastructure and its prospects for India.</p>	
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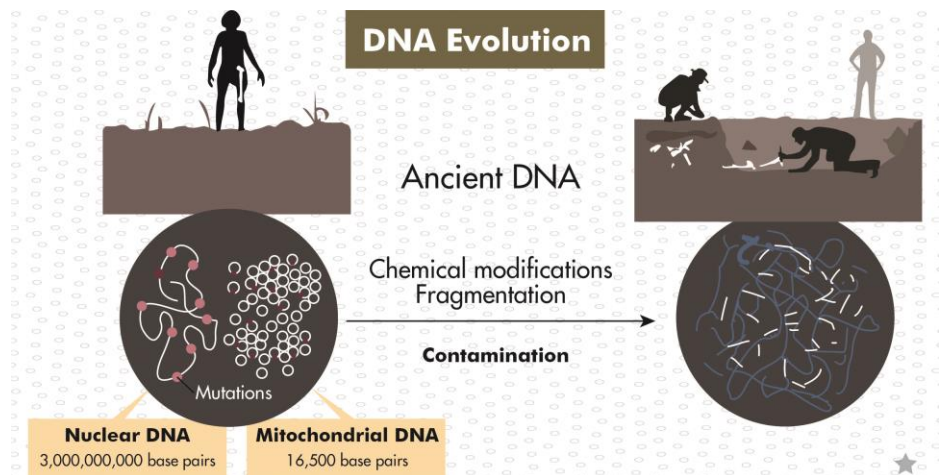
### 7.3. NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2022

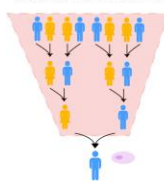



**Prize awarded for:** discoveries concerning the genomes of extinct hominins and human evolution.

**Awardee:** Prize was given to Swedish geneticist **Svante Pääbo**.

**About his discoveries on human evolution**

- He sequenced the genome of the **Neanderthal**, an extinct relative of present-day humans.
  - Neanderthals developed **outside Africa** and populated **Europe** and **Western Asia** from around **400,000 years**. They went extinct around **30,000 years ago**.
  - He analyzed and sequenced the **mitochondrial DNA (mtDNA)** of Neanderthals – demonstrating that Neanderthals were **genetically distinct**.
  - Though the **mtDNA** is small and contains only a fraction of genetic information, it is present in thousands of copies for sequencing.
  - In comparison, the **Nuclear DNA (nDNA)** tends to degrade and modify chemically over time, making it difficult to sequence them.
- He made the discovery of a previously unknown hominin, **Denisova**.
  - **Denisova** was discovered in **2008** from a cave in the southern part of **Siberia**.

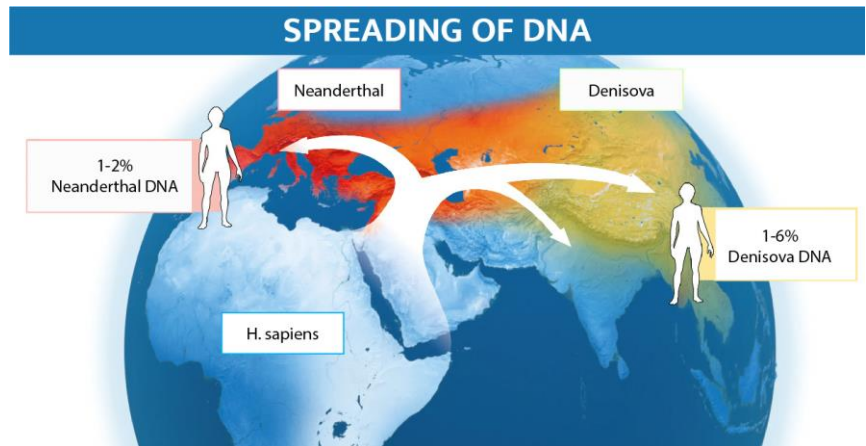


nDNA vs. mtDNA		
	Inheritance	Shape
Nuclear DNA (nDNA)	Nuclear DNA inherited from all ancestors 	Linear 
Mitochondrial DNA (mtDNA)	Mitochondrial DNA inherited from a maternal lineage 	Circular 

- He also found that **gene transfer** had occurred from these now extinct hominins to Homo sapiens following the migration out of Africa around 70,000 years ago.
  - **Homo sapiens**, or anatomically modern human, first appeared in Africa approximately **300,000 years ago**.
  - About **70,000 years ago**, groups of Homo sapiens **migrated from Africa to the Middle East** and, from there they spread to the rest of the world (refer image).

### Significance of his work

- His research gave rise to a new scientific discipline called **paleogenomics**, i.e. the study and analysis of genes of ancient or extinct organisms.
- His work on differences between living humans from extinct hominins is useful for:
  - **Better understanding** of human evolution and migration.
  - **Understanding** how the ancient flow of genes influences humans today. E.g.
    - ✓ **Neanderthal genes** affect our **immune response** to different infections, and
    - ✓ Denisovan version of the gene EPAS1 confers an **advantage for survival at high altitude** (commonly found among **Tibetans**).



## 7.4. ONE HEALTH

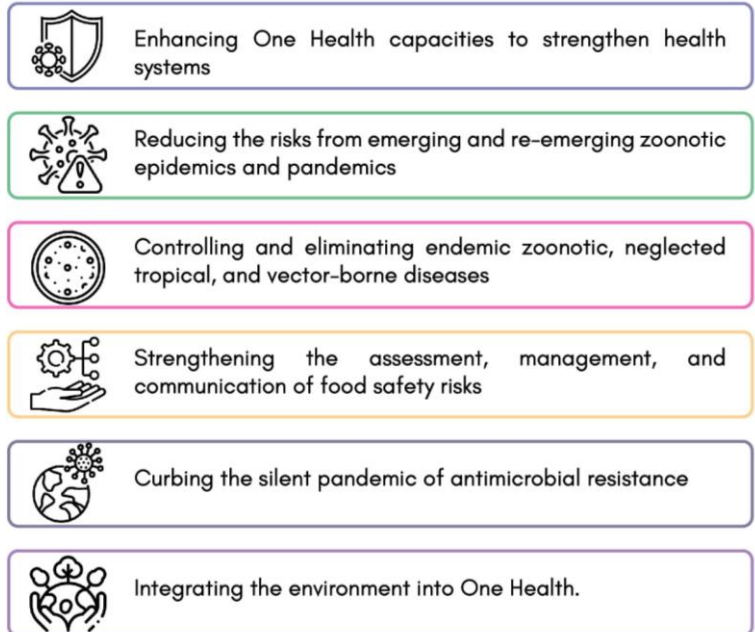
### Why in news?

Recently, four multilateral agencies have **launched a One Health Joint Plan of Action (2022-2026) (OH JPA)**.

**About One Health Joint Plan of Action (2022-2026) (OH JPA)**

- It was launched by the **'Quadripartite'** comprising:
  - **United Nations (UN) Food and Agriculture Organization (FAO)**,
  - **UN Environment Programme (UNEP)**,
  - **World Health Organization (WHO)**
  - **World Organisation for Animal Health.**
- The plan is valid from 2022-2026 and is **aimed at mitigating the health challenges at global, regional, and country levels.**
- It **will create a framework and integrate systems and capacity** to collectively better prevent, predict, detect and respond to health threats to all living beings as well as the environment.
- It outlines the commitment of the 4 organizations to **collectively advocate and support the implementation of One Health.**

### SIX ACTION TRACKS OUTLINED IN THE JOINT PLAN



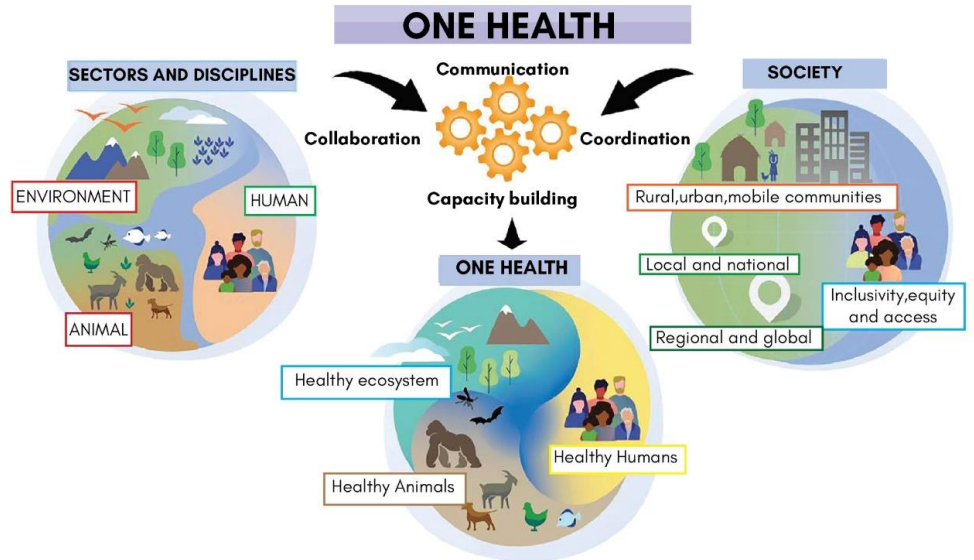
### Other Global initiatives

- **The Pilanesberg Resolution, 2001:** It was targeted at multilateral and bilateral donors and governmental authorities to consider potential wildlife health impacts in development projects.
- **One World-One Health:** Introduced by The Wildlife Conservation Society (WCS) in 2007 along with 12 recommendations (**Manhattan Principles**) that focused on establishing a more holistic approach to preventing epidemic disease and maintaining ecosystem integrity.
- **National Framework for One Health, 2021** by FAO guides towards overcoming the systemic barriers to implement the One Health approach.

- This will help **improve the health of humans, animals, plants, and the environment**, while contributing to sustainable development.

### About One health Concept

- One Health calls for a **holistic, integrated and systems-based approach** that recognizes the interconnection between the health of humans, animals, plants and the environment.
- It mobilizes multiple sectors, disciplines and communities to work together to **foster well-being and tackle threats to health and ecosystems**.
- At the same time, the approach aims at **addressing the collective need** for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.
- It is the primary approach for **addressing the complex health challenges facing our society**, such as ecosystem degradation, food system failures, infectious diseases and antimicrobial resistance (AMR).



### Driving factors for the need for one health approach

- Tackle Emerging infectious diseases (“Disease X” as highlighted by WHO):** 75% of Emerging infectious diseases and almost all recent pandemics are **zoonotic in nature**.
  - Moreover, rising International Travel & Trade** increases the potential for infectious diseases to spread quickly across borders.
  - For instance**, India recently reported multiple cases of monkeypox infection in travellers returning from UAE which soon led to the human to human transmission of the virus locally.
- Extension of Human activities:** Human activities like encroachment into natural habitats and altering them to extract resources, expansion of human populations into new geographic areas.
  - This **results in increased contact among wildlife, livestock, and people**, which allows microbes to ‘spill over’ from animals into human populations.
- Urbanization and climate change:** These factors are reinforcing the above trend by increasing pressure on land use and food systems and providing new, potentially more suitable, conditions for pathogens and diseases to develop and spread.
- Growing threat of antimicrobial resistance:** Emergence and spread of antibiotic resistant pathogens is on the rise due to irrational use of antibiotics in humans and animals, contaminated environments, and ineffective infection control policies.
- Increasing inequality, fragility, and violence:** Conflicts and the resulting fragility and violence, the displacement of

### CHALLENGES IN IMPLEMENTING ONE HEALTH APPROACH IN PRACTICE





populations, etc heightens the risk of disease transmission and make people and systems more vulnerable to pandemics.

### Steps taken in India to implement One health approach

In India, efforts have been made to bring human and animal health together. And recently, there have been several proactive steps in this direction:

- **Collaboration at national and state levels** to combat specific diseases or to overcome disease outbreaks such as the national influenza pandemic committee to control avian influenza, rabies in the Tamil Nadu and other states.
- **Institutional collaboration:** Institutes like Indian Council of Medical Research (ICMR) and Indian Council of Agricultural Research (ICAR) have collaborated for joint research priorities, to control disease outbreaks.
- **One Health Support Unit (OHSU)** initiated by the Department of Animal Husbandry and Dairying (DAHD), to develop a national **One Health Framework**.
  - The framework is **aimed at improving national and State-level resource allocation and policy ecosystem** on early prediction, detection, and diagnosis of zoonotic diseases through increased quality, availability, and utility of data evidence.
  - Under it, the pilot project are being implemented in states like Uttarakhand and Karnataka.
- **National Mission on Biodiversity and Human Well-being (NMBHWP):** It explicitly links biodiversity to human health by integrating biodiversity, ecosystem services, climate change, agriculture, health, bio-economy and capacity-building in the realm of biodiversity science.
  - It was launched by **Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC)**.
- **'One Health' project:** It envisages carrying out surveillance of important bacterial, viral and parasitic infections of zoonotic as well as transboundary pathogens in India, including the North-eastern part of the country.
  - It was launched by **Department of Biotechnology**.
- **Regional One Health Initiative:** It is an intersectoral approach to tackling the most urgent health threats in the region, with a focus on low and middle-income countries across south and southeast Asia and sub-Saharan Africa.

### Way ahead

Operationalizing a One Health approach requires improving coordination, communication, and collaboration between sectors, reinforced by sustained capacity strengthening. This requires:

- **A shift from largely vertical programs** focused on specific diseases to those that can strengthen overall systems and their collaboration across sectors.

#### Related News

Recently, **World Bank released a report** titled "Putting Pandemics Behind Us -Investing in One Health to Reduce Risks of Emerging Infectious Diseases".

- Report **emphasises on the importance of a Pandemic prevention approach** instead of just Preparedness and Response Plans.
- **Key highlights:**
  - **Investment in pandemic prevention has remained low** because the benefits are largely invisible and uncounted.
  - **Some drivers of pandemics** (e.g., forest exploitation, extractive industry, livestock farming, and urbanization) **are closely tied to income generation and livelihoods**, which can hinder necessary changes.
  - **Cost of Prevention guided by One Health principles**( approximately US\$11 billion per year) is **significantly less than the cost of pandemic preparedness**( US\$ 30 billion).

### PREVENTION

Actions to reduce the likelihood or consequences of spillover events



**Strengthen animal health, veterinary services**



**Improve on-farm bio-security**



**Reduce deforestation and/or forest degradation, improve conservation**



**Improve urban planning**

- **Developing databases and models** with a consolidated approach of ecologists, field biologists, epidemiologists and other scientists.
- **Strong Nexus** of science, social science, indigenous knowledge and policy at national, state and local levels.
- **Integration in Pandemic prevention plans:** The cost of prevention is moderate, with high returns on the investments. One health approach must be central to such plans.
  - Strategies as outlined by the World bank report are important in this direction (see box below).

## 7.5. FLEX FUEL







### Why in news?

Ministry of Road Transport & Highways has launched **first of its kind pilot project on Flexi-Fuel Strong Hybrid Electric Vehicles (FFV-SHEV) in India** which would run on 100% petrol as well as 20 to 100% blended ethanol and electric power.

### About Flex Fuel vehicles (FFV)

- Like traditional vehicles, flex fuel vehicles **have an internal combustion engine, but instead of regular petrol, it can run on blended fuel — petrol with ethanol or methanol.**
  - The ethanol mix can **vary between 20% and 85%.**
  - The vehicle has **additional sensors and different programming** of the engine control module to assess the blend of the fuel and adjust accordingly.
- Unlike electric hybrid vehicles, **no bulky parts need to be added** to the basic gasoline vehicle architecture.
- **Upgrading existing vehicles** to run on high blend of ethanol fuel, however, is possible **but expensive and not considered feasible.**
- **An FFV-SHEV** possesses a flex-fuel engine and an electric powertrain.
  - This setup **extends dual advantages of higher ethanol use and greater fuel efficiency**, as it can run on its EV mode for a good amount of time, while the engine stands shut off.

## Alternate Fuels - A Comparison

Fuel Type	Significance	Challenges
 <b>Ethanol as fuel</b>	<ul style="list-style-type: none"> <li>■ <b>Renewable, domestically produced</b> transportation fuel.</li> <li>■ Has a <b>higher octane number</b> than gasoline, which provides increased power and performance.</li> <li>■ Ethanol production creates jobs in rural areas</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Sporadic availability of ethanol</b></li> <li>■ Ethanol can also cause <b>corrosion and damage to the engine.</b></li> <li>■ Ethanol is also <b>not as economical as gasoline</b> as it does not provide the same level of fuel efficiency.</li> </ul>
 <b>Flex fuel</b>	<ul style="list-style-type: none"> <li>■ With much lower cost of running, they also offer <b>better economy for consumers.</b></li> </ul>	<ul style="list-style-type: none"> <li>■ The <b>benefit for the environment is less as compared to battery EVs</b> or hydrogen fuel cell vehicles of the future</li> </ul>
 <b>Hydrogen as a fuel</b>	<ul style="list-style-type: none"> <li>■ Can be produced from <b>diverse domestic resources</b></li> <li>■ <b>Potential for near-zero greenhouse gas emissions</b></li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Storing hydrogen is difficult</b> as it has a lower volumetric energy density</li> <li>■ <b>High production cost</b></li> </ul>
 <b>Biodiesel</b>	<ul style="list-style-type: none"> <li>■ <b>Lean-burning, renewable substitute</b> for petroleum diesel.</li> <li>■ <b>Improves fuel lubricity</b> and raises the cetane number of the fuel.</li> <li>■ It is <b>safer than petroleum diesel</b> because it is less combustible.</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Higher viscosity, lower energy content, higher nitrogen oxide (NO x) emissions</b>, lower engine speed and power.</li> </ul>
 <b>Electricity</b>	<ul style="list-style-type: none"> <li>■ <b>Improve fuel economy</b>, lower fuel costs, and reduce emissions.</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Public charging stations are not as ubiquitous as gas stations.</b></li> <li>■ The advanced batteries in electric vehicles are <b>designed for extended life but will wear out eventually.</b></li> </ul>
 <b>Natural Gas</b>	<ul style="list-style-type: none"> <li>■ <b>Domestic availability</b>, established distribution network, relatively low cost, and emissions benefits.</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Driving range of Natural gas vehicles (NGVs)</b> is generally less than that of comparable gasoline and diesel vehicles</li> </ul>

## Significance of FFV

- **Less polluting:** According to the US department of energy, they have lower overall greenhouse gas emissions, between 40-108%, depending on the feedstock used to produce them.
- **Manage glut in sugar production:** India suffers from a glut in sugar production of 6 million tonnes and in sugar season 2020-21, about 2.4 million tonne was diverted to produce 302 liters of ethanol for blending.
- **Burning facility:** Possibly the greatest advantage is that the flex fuel vehicle has been designed to burn whatever proportion of mixture is in its combustion chamber.
  - Electronic sensors gauge the blend, while microprocessors adjust the fuel injection and timing.
- **Reduce import bill:** as they reduce the dependence on crude oil.
- **Benefits farm community:** wide uptake of ethanol or methanol as a fuel may create additional revenue stream for farmers and aid in increasing farm income.

## Challenges of FFV

- **Lack of direct benefit to the consumer:** Though ethanol costs are much lower than petrol at ₹47-64/ltr depending on the sugarcane source, **oil marketing companies are expected to pocket the cost differential.**
  - It is also **controlled by the government.** So, chances of frequent revision are high.
- **Investment in infra:** For mass adoption, **adequate supply of different types of ethanol blends** is needed across the country.
  - This would have to be in addition to the existing network as current vehicles on the road would have to be supplied with fuel that has only 10% ethanol blending.
- **Issues with ethanol:** Constant supply must be ensured. However, since this largely comes from sugarcane in India, which is a water-guzzling crop, any drought could have an impact on blending rates.
- **Less vis-à-vis environmental benefits:** The benefit for the environment is less as compared to battery EVs or hydrogen fuel cell vehicles of the future.
- **Less Mileage:** While ethanol raises a vehicle's octane level, it contains less energy. It will take 1.5 times more to provide the same energy levels.
  - The report by Ministry of Petroleum and Natural Gas mentioned that **E20 blending will result in drop in fuel efficiency by nearly 6-7%** in 4 wheelers calibrated to E10.
- **Resource Scarcity:** NITI Aayog in a report mentioned that over 90% of ethanol in India came from sugarcane alone, and other food crop like maize.
  - While availability of **sufficient feedstock on a sustainable basis is challenge.**

### Steps taken by government

- India is aiming to achieve **E10 by 2022 and E20 by (20% ethanol blend) by 2025**
- **Bharat Stage Norms** - India directly shifted from BS-IV to BS-VI norms.
- Government has included **automobile & auto components of flex-fuel engines into the Production Linked Incentive (PLI) scheme.**
- Finance Minister in the Union Budget announced that **unblended fuel shall attract an additional differential excise duty of ₹2/ litre from October 2022.**

## Way forward

- **Research and development:** There is need of more investment in research and development for optimization of engine for higher ethanol and alternate fuels like methanol, LNG, CNG blends and improve durability.
- **Incentives and pricing:** Vehicles compliant with higher ethanol and other alternative fuel blends are to be provided higher tax benefits.
  - For better acceptability of higher flex fuels, **retail price of such fuels should be lower than normal petrol and tax breaks may be considered by the government** on ethanol and alternate fuels.
- **Infrastructure development:** Oil Manufacturing Companies will need to prepare for the projected requirement of **ethanol storage, handling, blending and dispensing infrastructure.**
- **Augmentation of ethanol production:** Over the time, technology for **production of ethanol from non-food feedstock, called "Advanced Biofuels" including second generation (2G)** should be promoted, without causing any tradeoff with the food production system.



## 7.6. MARS ORBITER MISSION

### Why in news?

India's Mars Orbiter Mission (MOM) spacecraft has lost communication with the ground stations, bringing an end to its life after eight long years.

### More about news

- It was declared that the spacecraft is non-recoverable and attained its end-of-life.
- However, ISRO is working out the details of whether the spacecraft ran out of fuel and battery power, or whether communication was lost because of an automated maneuver.

### About Mars Orbiter Mission (MOM) or Mangalyaan

- The Rs 450 crore Mars Orbiter Mission was launched onboard **PSLV-C25** on November 5, 2013.
  - MOM spacecraft was successfully inserted into Martian orbit on September 24, 2014, in its first attempt.
  - Mangalyaan was India's **first interplanetary mission**.
- The **mission made India the first Asian country, and the fourth in the world** after Roscosmos (Russia), NASA (US), and the European Space Agency (EU), to get to the planet.
- MOM carried 850 kg of fuel and **5 science payloads** which it has been using to study the Martian surface and atmosphere since entering the orbit successfully.
- The spacecraft is tracked by the **Indian Deep Space Network (IDSN)**, located near Bengaluru and complemented by NASA-JPL's Deep Space Network.

## Objectives of the Mars Orbiter mission



**Scientific:** To explore Martian surface features, mineralogy morphology and atmosphere using indigenous scientific instruments .



**Technological:** To develop technologies required in planning, designing, management and operations of an interplanetary mission

## Five payloads of MOM



### 1. MARS COLOUR CAMERA

It will take pictures of Mars' surface. The photos will put the information provided by other instruments on the orbiter into context.



### 2. Lyman alpha Photometer

it will study the ratio of deuterium and hydrogen. The data will answer the question if water is present in the planet, or was present in the past



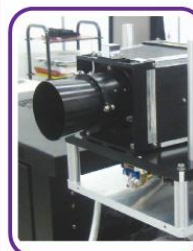
### 3. THERMAL INFRARED IMAGING SPECTROMETER

It will map the surface composition and mineralogy of the planet by measuring thermal emissions



### 4. MARS EXOSPHERIC NEUTRAL COMPOSITION ANALYSER

It will measure radial, diurnal and seasonal variations in the Martian exosphere



### 5. METHANE SENSOR

It will scan the entire Martian disc within six minutes and measure very low levels of methane in parts per billion quantities.

## Significance of MOM

- **Advanced technology capability:** It is a progress towards a sustained and affordable space programme to explore the planet.
- **Space exploration:** It will promote the future capability to actively collaborate and to carry out scientific experiments of interest to the nation.
  - It could propel India to the centre of planetary exploration, which is dominated by the US and Russia.
- **Employment Opportunities:** It will promote employment generation and human resource development in advanced science and R&D activities.
- **International partnerships:** The programme will strengthen international partnerships through the sharing of challenging and peaceful goals.
  - It can be leveraged as a potent foreign policy tool.

### Technological Achievements of MOM

- Mars Orbiter Mission has gifted **an understanding of the composition of several gases in the Martian exosphere**, quantified the altitude where the Martian atmosphere has a transition from the CO<sub>2</sub> rich regime to atomic Oxygen-rich regime during the local evening.
  - The mission is also **credited with the discovery of ‘suprathermal’ Argon-40 atoms in the Martian exosphere**, which gave some clue on one of the potential mechanisms for the escape of atmosphere from Mars.
- The MOM **spacecraft photographed**, for the first time, the **far side of Deimos, one of the natural satellites of Mars**.
- The mission **captured the time-variation of the Martian polar ice caps**.
  - It also measured the Martian apparent albedo that indicated the reflecting power of the Martian surface.
- The mission gave an opportunity to **classify extra-terrestrial landslides using machine learning models**.
- **Recognition**
  - Indian Space Research Organization (ISRO)- Mars Orbiter Mission (MOM) team **won the US based National Space Society’s ‘Space Pioneer Award’** for science and engineering category for the year 2015.
  - **The Indira Gandhi Prize for Peace, Disarmament and Development is awarded to ISRO** in recognition of Mars Orbiter Mission, for its significant contribution in strengthening international cooperation in peaceful use of outer space.

## Other Mars Mission

Space Missions	Date of launch	Key Features
<b>Perseverance (NASA, USA)</b>	2021	<ul style="list-style-type: none"> <li>• The rover will search for past life on Mars and collect soil and rock samples for future return to Earth.</li> </ul>
<b>Hope Mission (United Arab Emirates)</b>	2021	<ul style="list-style-type: none"> <li>• It is intended to examine Martian weather and atmospheric layers.</li> <li>• During the first year, the orbiter confirmed the existence of a discrete aurora, a highly localized atmospheric phenomenon on the night side of the planet, water-bearing clouds that grow and shrink daily.</li> </ul>
<b>Tianwen 1 (China)</b>	2021	<ul style="list-style-type: none"> <li>• Tianwen-1 is China's first Mars mission, consisting of an orbiter and a rover named Zhurong.</li> <li>• Among the rover’s science instruments is a radar that could detect pockets of water beneath the surface, which may contain life.</li> </ul>
<b>Mars Moons Exploration (MMX) mission (Japan)</b>	2024	<ul style="list-style-type: none"> <li>• Japan will launch the Mars Moons Exploration (MMX) mission to bring back rock samples from Phobos, one of the two moons of Mars.</li> </ul>

## Conclusion

The configuration and design of MOM spacecraft have worked perfectly well throughout all the phases of the mission. The excellent working of all the systems of the spacecraft has established the deep space mission heritage. The configuration and design of these systems can also be adopted future interplanetary missions of ISRO.

## 7.7. NEWS IN SHORTS

### 7.7.1. COMMERCIAL 5G SERVICE

- Government recently launched commercial 5G service.
- 5G (5<sup>th</sup> generation) is a next generation **mobile network technology after 4G LTE networks**. It is **not a single technology but an amalgamation of various technologies** such as:
  - **Massive multi-user MIMO** (Multiple input multiple output) enabled network.
  - **Small cell stations** to connect the base stations and users seamlessly.
  - **Mobile Edge Computing** that brings cloud computing closer to the user physically.
  - **Beamforming** which can be visualized as a laser beam between transmitting entity and the user.
- 5G is believed to accelerate the adoption of **cloud gaming, AR/VR technology, Internet of Things**, etc. and usher into **wider use areas** than 4G.
  - This includes areas such as **healthcare, FinTech, Agriculture and Livestock, Smart Applications, Education**, etc.
- **Comparison between 4G, 5G and 6G**

Parameter	4G	5G	6G (launch targeted at end of this decade)
<b>Spectrum (Frequency Bands)</b>	600 MHz, 700 MHz, 1.7/2.1 GHz, 2.3 GHz, and 2.5 GHz	Sub-6 GHz (Gigahertz) and above 24.25 GHz (Up to 100 GHz)	Sub-6 GHz and 95 GHz to 3 THz (Terahertz)
<b>Peak Data Rates</b>	1 Gbps	Up to 20 Gbps	Up to 1,000 Gbps
<b>Latency (End to End Delay)</b>	60-100 milliseconds	5 milliseconds	1 millisecond

### 7.7.2. THE GLOBAL LIGHTHOUSE NETWORK (GLN)

- Recently, **World Economic Forum announced the addition of three factories** to its Global Lighthouse Network-
  - Cipla's Indore facility,
  - Dr Reddy's Laboratories' Hyderabad facility and
  - The Mondelez facility in Sri City, Chennai.
- The **Global Lighthouse Network is a World Economic Forum initiative in collaboration with McKinsey & Company**.

- It is a **community of over 100 manufacturers** that are showing **leadership in applying Fourth Industrial Revolution technologies** such as artificial intelligence, 3D-printing and big data analytics.

### 7.7.3. LVM3-M2

- ISRO's heaviest rocket (LVM3-M2) successfully placed 36 satellites of OneWeb in orbit.
- LVM3-M2 mission was the **first dedicated commercial satellite mission of New Space India Limited (NSIL)**.
  - NSIL, a **public-sector enterprise under Department of Space**, is **enabling Indian industries to take up high technology space-related activities** and is catering to emerging global commercial small satellite launch service market.
- Mission **establishes ISRO's growing capabilities to undertake mega missions** and fill in vacant niche in **global market** by launching a **constellation of satellites** (see **image** on competing launch vehicles).
  - Currently, **ISRO holds only 2% of global commercial space sector market**.
- **About LVM3-M2 launch vehicle** (earlier called Geosynchronous Launch Vehicle Mark III or GSLV-MK3)
  - It is a **3-stage launch vehicle consisting of Cryogenic Upper Stage, Solid Rocket Boosters and Core Liquid Stage**.
  - It has a carrying capacity of **8 tonnes to low earth orbit (LEO)** and **4 tonnes to geo transfer orbit (GTO)**.
  - It is ISRO's **second rocket** for global commercial market, after its **Polar Satellite Launch vehicle (PSLV)**.
  - **It has had four successful missions including Chandrayaan-2** and will be used for **Gaganyaan** (Human Space Flight), **Chandrayaan-3** and **Aditya L1** (mission to study sun) **as well**.

#### About OneWeb

- OneWeb is a **joint venture between India's Bharti Enterprises and U.K. government** to deliver high-speed, low-latency connectivity worldwide.
- OneWeb satellites **operate in LEO** at an altitude of 1,200 kilometers.



## Launch Vehicles (Global)

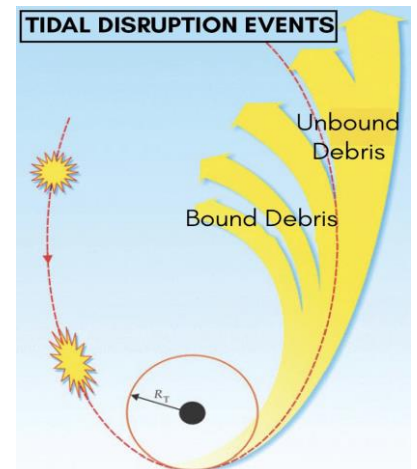


\*Standard: Liftoff mass & payload capacity in tonnes

- Study shows that there is a **thin layer of sodium atoms** that are **weakly bound to the lunar surface** apart from the **minor quantities** found in lunar rocks.
- **Chandrayaan-2**, launched in 2019, is the **second lunar exploration mission** developed by the ISRO. It consisted of a **lunar orbiter, the Vikram lander, and the Pragyan lunar rover.**

### 7.7.6. TIDAL DISRUPTION EVENTS (TDES)

- In 2018, **scientists observed a black hole** ripping a star into shreds because it got too close.
  - It was discovered when scientists were **revisiting TDEs** that occurred over last few years.
- TDE refers to an event when a **black hole violently rips apart stars that gets too close.**
  - When a star comes close to a black hole, **gravitational forces will stretch or "spaghettify" star.** (see image)
  - Then, **elongated material spirals around black hole**, gets heated up, and **creates a flash** that can be detected by us millions of light years away.



### 7.7.4. SAMPURNANAND OPTICAL TELESCOPE (SOT)

- SOT, **located at ARIES, Manora Peak, Nainital (Uttarakhand), completed 50 years of operations.**
  - Aryabhata Research Institute of Observational Sciences (ARIES) **specializes in observational Astronomy & Astrophysics and Atmospheric Sciences.**
- **SOT's major instruments:** Cassegrain plate holder, Meinel camera, photoelectric photometer, polarimeter etc.
- SOT has been **used for optical observations of comets, occultation by planets and asteroids, star forming regions** and star clusters, active galactic nuclei, etc.
- **Important discoveries made:** discovery of rings of Uranus, Saturn, Neptune; first detection of optical afterglows of Gamma-ray-bursts (GRBs); micro-lensing event, discovery of quakes in various stars (under Nainital-Cape Survey program) etc.

### 7.7.5. SODIUM CONTENT ON MOON'S SURFACE

- Scientists from ISRO have mapped out **global distribution of sodium on the Moon's surface.**
  - They used the **CLASS instrument** (Chandrayaan-2 large area soft X-ray spectrometer) carried by **Chandrayaan-2 for the study.**

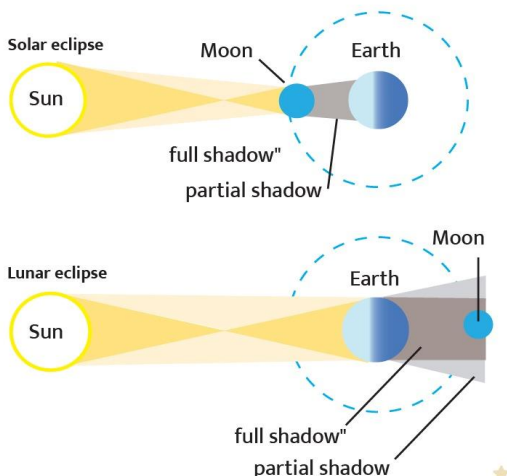
### 7.7.7. GAMMA RAY BURST (GRB)

- Astronomers have observed the **brightest flash of light ever seen**, from an event that occurred 2.4 billion light years from Earth.
  - It **was a GRB** called GRB221009A.
  - This type of GRB is thought to occur **when a massive star explodes in a supernova, leaving behind a black hole.**
- GRBs are the **most powerful explosions** Universe has seen since the **Big Bang.**
  - They are **brief, but intense, flashes of gamma radiation.**
  - They produce as much energy as **Sun will emit during its entire 10-billion-year existence.**

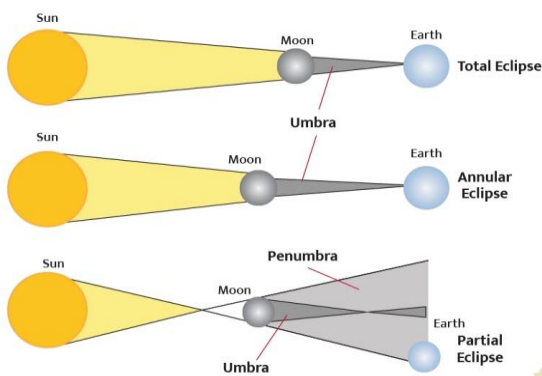
### 7.7.8. PARTIAL SOLAR ECLIPSE

- A solar eclipse occurs when **Moon gets between Earth and Sun**, and **moon casts a shadow over Earth**. Solar eclipses **happen only at the new moon phase**.
  - **Lunar eclipses** occurs when **Earth positions itself between sun and moon**, casting a shadow across lunar surface. They can only **occur during a full moon**.
- **Different types of solar eclipses are:**
  - **Total solar eclipse:** It happens when Moon passes between Sun and Earth, **completely blocking face of Sun**. It is only visible from a small area on Earth.
  - **Partial solar eclipse:** This happens when sun, moon and Earth are not exactly lined up. Only a part of the Sun will appear to be covered, **giving it a crescent shape**.
  - **Annular solar eclipse:** It happens when moon is farthest from Earth. It does not block entire view of the sun. This looks like a ring around the moon.
  - **Hybrid solar eclipse:** Because Earth's surface is curved, sometimes an eclipse can shift between annular and total as Moon's shadow moves across the globe.

Solar and Lunar Eclipse



Types of Solar Eclipse



### 7.7.9. GENETICALLY MODIFIED MUSTARD

- GEAC has recommended the environmental release of **transgenic hybrid mustard Dhara Mustard Hybrid-11 (DMH-11)**.
  - The recommendation will now go for the **approval of the MoEFCC**.
  - **Earlier, in 2017**, GEAC had cleared its proposal but it was vetoed by the Ministry.
- This paves the way for **commercialisation of country's first GM food crop**.
  - The commercial use will be under the **supervision of Indian Council of Agriculture Research (ICAR)** and will be subject to the **Seed Act, 1966**.
- **About DMH-11**
  - DMH-11 has been developed by **Delhi University's Centre for Genetic Manipulation of Crop Plants (CGMCP)** containing two alien genes isolated from a soil bacterium called **Bacillus amyloliquefaciens**.
  - It has been developed by crossing a Indian mustard variety '**Varuna**' (the **barnase** line) with an East European '**Early Heera-2**' mutant (**barstar**).
    - ✓ In this, the **first gene ('barnase')** codes for a protein that impairs pollen production and renders the plant into which it is incorporated male-sterile.
    - ✓ The second is the '**barstar**' gene that **blocks the action of the barnase gene**.
    - ✓ The resultant F1 progeny is **both high-yielding and also capable of producing seed/ grain**.

#### Genetic Engineering Appraisal Committee (GEAC)

- GEAC is the **apex biotech regulatory body in India** under the Ministry of Environment, Forests & Climate Change (MoEFCC).
- It has been notified under **Environmental Protection Act, 1986**.
- GEAC is a **body responsible for appraisal of proposals relating to the "release" of GM organisms and products** (ordinarily considered hazardous) into the environment.

### 7.7.10. WORLD HEALTH ORGANIZATION RELEASES GLOBAL TB REPORT, 2022

- **Key findings- global**
  - Estimated **number of deaths from TB increased** between 2019 and 2021, reversing years of decline between 2005 and 2019. (Attributed to Covid-19 pandemic.)
  - Around 10.6 million people were diagnosed with TB in 2021, **an increase of 4.5%** from 2020.
  - **TB is the second leading infectious killer** after COVID-19 (above HIV/AIDS).

- **India specific findings**
  - With 28% of cases, **India has the highest TB patient count.**
  - **Gap between estimated TB incidence and reported number of people newly diagnosed** is highest in India (24%).
  - **India was among the three countries** that accounted for **most of the reduction in 2020** (67% of the global total).
- Top five risk factors of TB: **undernutrition, HIV infection, alcohol use disorders, smoking, and diabetes.**
- TB is caused by **bacillus Mycobacterium tuberculosis** which typically affects lungs (pulmonary TB) but can affect other sites.
  - Most common medications used to treat TB include **isoniazid, rifampin, ethambutol, pyrazinamide etc.**
  - Currently, **Bacille Calmette-Guerin (BCG)** is the **only licensed vaccine** available for prevention of TB.
  - It spreads from **person to person** through air.

**Additional information:**

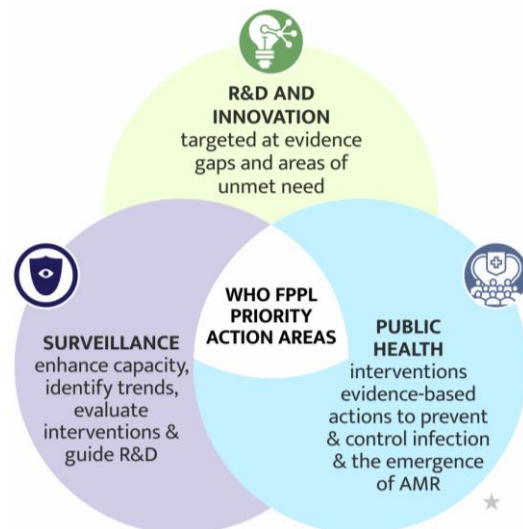
- **Drug-Resistant TB:**
  - **Multidrug Resistance TB (MDR):** resistant to at least **isoniazid and rifampicin.**
  - **Extensively drug-resistant tuberculosis (XDR-TB):** resistant to **isoniazid and rifampin, plus any fluoroquinolone** and at least one of three injectable second-line drugs.
  - **Totally drug-resistant tuberculosis (TDR-TB):** **resistant to all first- and second-line TB drugs.**
- **Steps taken by India to check TB**
  - **India's vision to eliminate TB by 2025**, five years ahead of global target by WHO i.e., 2030.
  - **National Strategic Plan for Tuberculosis Elimination 2017-2025** by Ministry of Health & Family Welfare.
  - National Tuberculosis Elimination Program.
  - TB Harega Desh Jeetega Campaign.
  - **Nikshay Poshan Yojana** for nutritional support to TB patients.

**7.7.11. FIRST-EVER FUNGAL PRIORITY PATHOGENS LIST (FPPL)**

- World Health Organisation (WHO) has released the first-ever fungal priority pathogens list (FPPL).
- The FPPL which includes 19 fungi categorised as critical, high, and medium priority will help **identify fungi which pose the greatest threat to public health.**
  - Critical group includes **Cryptococcus neoformans, Candida auris, Aspergillus fumigatus and Candida albicans.**
  - High group includes **Nakaseomyces glabrata (Candida glabrata), Histoplasma spp., eumycetoma causative agents, Mucorales,**

**Fusarium spp., Candida tropicalis and Candida parapsilosis.**

- Medium group are **Scedosporium spp., Lomentospora prolificans, Coccidioides spp., Pichia kudriavzeveii (Candida krusei), Cryptococcus gattii, Talaromyces marneffeii, Pneumocystis jirovecii and Paracoccidioides spp.**
- **Fungal pathogens are a major threat to public health** as:
  - **Most fungal pathogens lack** rapid, sensitive and affordable **diagnostics** and **only four classes of antifungal medicines (azoles, echinocandins, pyrimidines and polyenes)** currently available.
  - The **incidence and geographic range of fungal diseases** are **expanding worldwide** due to global warming and the increase of international travel and trade.
  - During the COVID-19 pandemic, **the reported incidence of invasive fungal infections increased significantly among hospitalized patients.**
  - Fungi that cause common infections become **increasingly resistant to treatment.**
    - ✓ Resistance to antifungal medicines is **partly driven by inappropriate antifungal use.**



**7.7.12. ORAL REHYDRATION SOLUTION**



- Dr Dilip Mahalanabis who pioneered the proper practical, emergency use of oral rehydration solution, commonly known by its abbreviation “ORS,” for diarrhoeal diseases passed away recently.
  - Dr Dilip Mahalanabis was working in refugee camps during the 1971 Bangladesh Liberation war when he came up with ORS.
- The Lancet called that **ORS is the most important medical discovery of the 20th century.**
  - Diarrhoea was among the leading causes of child deaths in developing countries in the twentieth century.



- In 2002, **Dr Dilip Mahalanabis along with Dr Nathaniel F Pierce was awarded the Pollin Prize** by Columbia University (considered the equivalent of Nobel in paediatrics).
- Oral rehydration salts (ORS) are a **mixture of electrolytes (salts) and carbohydrates (in the form of sugar) dissolved in water.**
  - They are used to replace salts and water that the body loses when you have dehydration caused by gastroenteritis, diarrhoea or vomiting.
  - The electrolytes are **potassium and sodium.**
- These components **maximize fluid absorption in the gastrointestinal tract.**
  - The gastrointestinal tract relies on **sodium-glucose cotransporters (SGLTs)**, which are carrier proteins in the intestinal cells.
  - Cotransporters help move substances across membranes.
  - Specifically, SGLTs pair together sodium and glucose transport in the small intestine. This allows glucose to increase the absorption of fluids.
- Additionally, **sodium needs glucose to be properly absorbed.** Therefore, ORS contains both glucose and sodium.
- Since 1975, the World Health Organization and UNICEF have used ORS to treat dehydration due to diarrhea.
  - It's commonly **used in countries with limited access to clean water** or other hydration options.

### 7.7.13. ATHLETE BIOLOGICAL PASSPORT (ABP)

- National Anti- Doping Agency (NADA) & NDTL are hosting 3rd edition of World Anti-Doping Agency (WADA) ABP Symposium.
- **ABP is an Anti-doping tool that monitors selected biological variables over time to reveal effects of doping rather than attempting to detect doping substance or method** itself.
  - It **works against doping through enhanced target testing and analysis**, investigations, deterrence, and as indirect evidence for use of prohibited methods or substances.

 <p><b>SMART QUIZ</b></p>	<p>You can scan this QR code to practice the Smart Quiz of Science &amp; Technology at our open test online platform for testing your understanding and recalling of the concepts.</p>	
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## 8. CULTURE

### 8.1. MAHAKALESHWAR TEMPLE

#### Why in news?

The Prime Minister recently inaugurated the first phase of Mahakal Lok in Ujjain's Mahakaleshwar temple.

## Mahakaleshwar Temple



#### More on news

- The Mahakal Lok is the **mega corridor project that will expand the Mahakaleshwar temple complex area**, significantly enhancing the holding capacity.
- The corridor will have two grand gateways:
  - Colonnade of 108 ornate pillars which **depict Anand Tandav Swaroop (the elated dance form) of Lord Shiva**,.
  - a running panel of over **50 murals depicting stories from Shiv Purana**.
- The entire redevelopment plan is **expected to cost Rs 705 crore**.

#### About Mahakaleshwar temple

- It is situated in **Ujjain (Madhya Pradesh)** on the banks of the river **Shipra**.
- The **exact time of establishment of Mahakala temple is not known**. As per Puranas, it was **first established by Prajapita Brahma**.
  - Later on, prince **Kumarasena (son of king Chanda Pradyota of Pradyot dynasty)** in **6th century BC** looked after the law and order situations of Mahakala temple.
    - ✓ **Pradyota dynasty ruled over Avanti ( now Madhya Pradesh), between 8<sup>th</sup> to 6<sup>th</sup> century BC**.
- **Kalidasa in Raghuvansam described this temple as 'Niketana'** possibly due to the fact that the roofs of temples had mostly been flat.
- It was **redeveloped and reconstructed over the centuries** and as a result, the temple complex **bears strong influences of the Bhumija, Chalukya, and Maratha architectural styles**.
- The **Mahakaleshwar Jyotirlinga** is among the **most eminent of the 12 Jyotirlingas in India**:

#### Mythological story of Mahakaleshwar

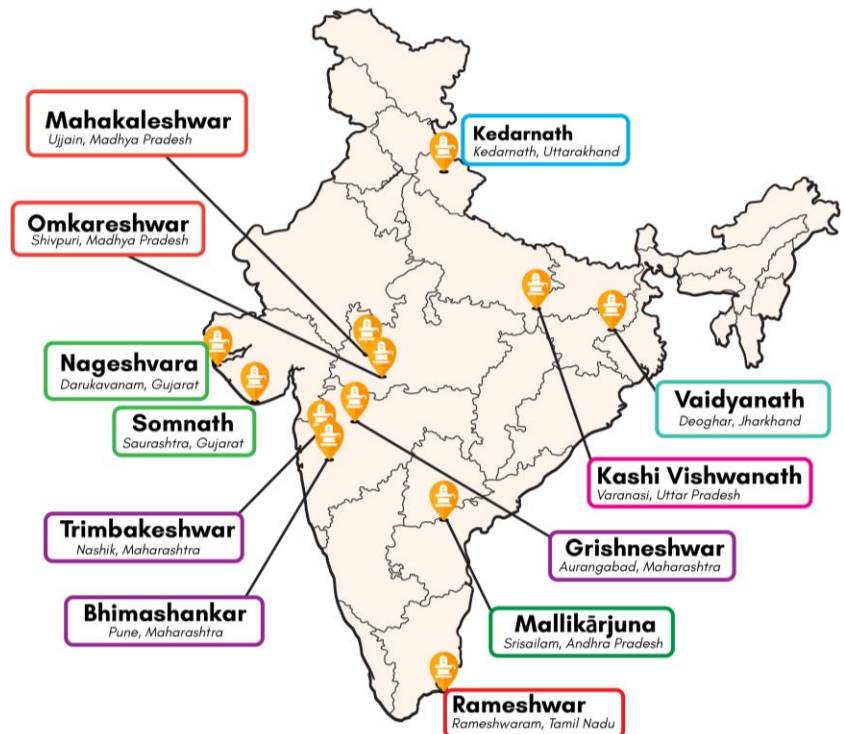
Local legend says that there once was a king called Chandrasena who ruled Ujjain and was a Shiva devotee. The Lord appeared in his Mahakal form and destroyed his enemies. Upon the request of his devotees, Shiva agreed to reside in the city and become its chief deity.

- It is the **only jyotirlinga facing the south**, as opposed to the traditional placement in north or east. By facing the south, believed to be the direction of Yama – the God of Death, Shiva symbolises that he’s the master of death or Mahakaleshwar.
- It is **believed to be swayambhu i.e. self-manifested** while other Jyotirlingas are believed to have been ritually established.
- One of the most famous features of Mahakaleshwar Temple is the **Bhasma aarti** —the prayer offering of ashes (made from burning dried wood and cow dung).
  - The aarti is quite exclusive and women are not allowed to witness it.

#### More about architectural styles

- **Bhumija style** was characterised by a central Latina/ Shikhara tapering from all sides, with minor spires decorating the central spire.
- **Chalukya style** had distinguishable characteristics as their stellate (star shaped) and stepped plans.
- **Maratha style** temples are conspicuous by their wooden *sabhamandaps* with cypress-shaped columns, stone fountains, and the *shikharas* constructed in brick and lime.

## Jyotirlingas in India



#### Key features in the present architecture of the temple

- The temple is **three-storeyed**.
  - In the lowest middle and uppermost parts are respectively installed the **lingams of Mahakalesvara, Omkaresvara and Nagachandresvara**.
- Besides Jyotirlinga, images of Ganesa, Kartikeya and Paravati can be seen in the garbhagrha.
- The **shikhara with the mini-spires** is very peculiar.
- A very large-sized **Kunda** named **Koti Tirtha** also exists in the temple-complex.
- The **form of Shiva in Ujjain is that of Mahakal** — the Lord of Time and Death.

#### Ujjain City-Facts

- The city of Ujjain was also **one of the primary centres of learning for Hindu scriptures**, called **Avantika** in the **6th and 7th centuries BC**.
- Later, astronomers and mathematicians such as **Brahmagupta and Bhaskaracharya** made Ujjain their home.
- As per the **Surya Siddhanta**, one of the earliest available texts on Indian astronomy of 4th century, Ujjain is **geographically situated at a spot where the zero meridian of longitude and the Tropic of Cancer intersect**.
  - In keeping with this theory, **many of Ujjain temples are in some way connected to time and space**.
- In the 18th century, an observatory was built here by **Maharaja Jai Singh II**, known as the **Vedh Shala or Jantar Mantar**, comprising 13 architectural instruments to measure astronomical phenomena.

## 8.2. NUMISMATICS IN INDIA

### Why in news?

The recent discussion on putting images of Gods and Goddesses on coins and banknotes has renewed interest in Numismatic history of India.

### More on News

- **Who changes the design on Currency notes?**
  - The **Reserve Bank of India (RBI) and central government** have the power to design the currency notes in India.



- Any change in **currency design needs to be approved by the RBI's Central Board and the Central Government.**
- **How does the process of changing currency notes work?**
  - **RBI's Department of Currency Management** works on the design.
  - It **submits the design to the RBI** and then it **sends for recommendation to the central government.**
  - **The Centre gives the final approval for the design** of the currency notes.

### Beginning of Numismatic study in India

- Numismatics is **the study and collection of coins, tokens, and other coin-like objects** that people used as currencies **throughout history.**
- The term may also refer to the **study of money and other payment methods** that people use to pay for goods and services and to settle debts.
- With the **discovery of some Roman coins** in 1790 begins the **history of Indian Numismatics.** It started as a **subject of study and research** in 1824 when Col. Todd published some **Greek, Parthian, and Indian coins** in the Transactions of the **Royal Asiatic Society.**
- **Numismatic Society of India** (founded in 1910) at Allahabad was intended as a **coordinating body** to promote the **knowledge and regulate the study of Indian numismatics.**

### Major Numismatic stages of India

- **Ancient India coinage:** Starting with 'Punch marked' coins, this era includes coins attributed to 'Janapadas' as well as the 'Mauryan period'. The motifs found on these coins were mostly **drawn from nature** like the sun, various animal motifs, trees, hills etc. and some were **geometrical symbols.**
- **Dynastic Coins:** These coins relate to those of the **Indo-Greeks, the Saka-Pahlavas and the Kushans.** **Hellenistic traditions** characterise the silver coins of the Indo-Greeks, with Greek gods and goddesses figuring prominently, apart from the **portraits of the issuers.**
  - This stage also includes coinage from the Gupta, Post-Gupta and South Indian Empires of Cholas, Cheras, Pandyas, Pallavas and Hoysalas among others.
- **Coins of Medieval period:** With the emergence of **Turkish Sultans** of Delhi in the 12th Century, existing motifs were gradually replaced by **Islamic devices, largely calligraphy.** The unit of account came to be consolidated and was referred to as the **'tanka'** with the **'jittals'** as the **smaller value coins.**
- **British Indian Coinage:** Enactment of **Coinage Act of 1835** led **uniform coinage** with effigies of Prince William IV and Queen Victoria. The act was succeeded by **Indian Coinage Act of 1906.**

*For details on every stage of the numismatic history, please refer to the 'Appendix: Numismatic history of India' at the end of the document.*

### Coins of modern India

- The **first Rupee coin** of Republic of India was minted in 1950.
  - Other denominations of **coins of modern India** were also produced like the 1/2 Re, 1/4 Re, 2 Anna, 1 Anna, 1/2 Anna & 1 Pice coins which are also referred as **Anna series or pre-decimal coinage.**
  - In 1957, India shifted to the **decimal system.**
- **Special coins were minted in memory of important events or personalities.** These are referred to as **commemorative Indian coins.**
- Some of commemorative coins include coins depicting **Mahatma Gandhi, Jawaharlal Nehru, Indira Gandhi, B. R. Ambedkar, Rajiv Gandhi, Saint Dnyaneshwar, Sardar Vallabhbhai Patel, Subhas Chandra Bose** etc.

### Significance of numismatics in understanding history

- **Sources of historical information through inscription:** Coins are **part of archaeological sources** and are as important as the inscription in history. They **confirm the information** derived from literature.



- **Help in identification of connections and key events:** Tracing ancient Indian coins **showcases the marketplaces** along the Silk Road, the trade route that **connected the East and West**; conquerors and their **traveling mints**; **wars**; and **lost kingdoms**.
- **Key sources for chronological confirmation:** Coins with dates are **very valuable for the framework of Indian chronology**. For instance, Coins are almost our sole evidence with regard to the **Indo Scythian and Indo Bactrian Kings**.
- **Placing the extent and influence of empires:** The inscription on the coin indicates **territory over which the rulers ruled**. The discovery of the **same kind of coins** at different places helps in fixing the **coverage of various kingdoms** in ancient India.
- **Other benefits-**
  - The purity of the metal reflects the **financial conditions** of the Gupta Empire. **Foreign coin hoards** found in India throw light on **Indian trade patterns** in ancient, medieval, and late pre-colonial times.
  - Some coin throws significant light on the **personal events of certain rulers**.

### Conclusion

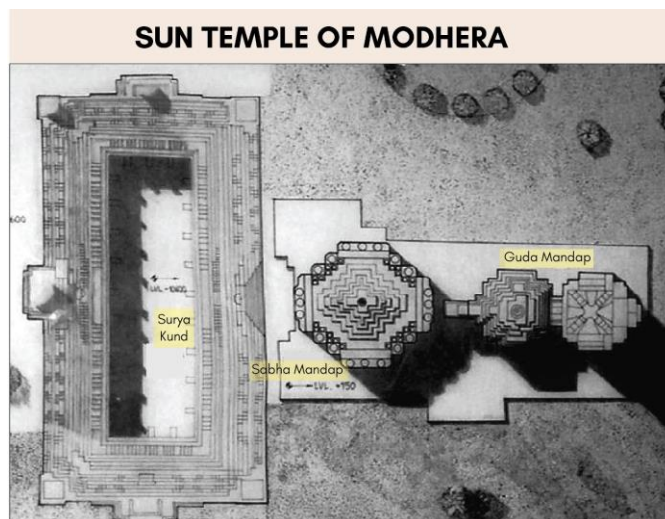
The numismatic study of India not only provides an insight into political events, extent, and personalities, but also into social, economic and cultural life of people in those times.

## 8.3. NEWS IN SHORTS

### 8.3.1. MODHERA

- PM recently **declared Modhera as India's first 24x7 solar-powered village**.
- Along with the Modhera village, the Sun Temple of Modhera also became the **first heritage site in India** to be powered **solely by solar energy**.
  - The PM also inaugurated the **3D Projection Mapping** of the Modhera Sun Temple.
- **About Sun Temple of Modhera (Gujarat)**
  - **Built** in 1026-27 AD during **Chalukya King Bhimdev I (1022-1063 AD)** regime.
    - ✓ The earliest **Dilwara Temples** and the **Rani ki vav** (attributed to his **Queen Udayamati**) were also built during his regime.
  - **Location:** One of the four main Sun Temples, it is located on the banks of **River Pushpavati** and falls near the **Tropic of Cancer**.
    - ✓ The other **3 main Sun Temples** are: **Konark Sun Temple** (Odisha), **Martand Sun Temple** (Jammu and Kashmir) and **Dakshinaarka Sun Temple** (Gaya).
  - **Temple Architecture:** **Maru-Gurjara style** with temple complex divided into **three parts-**
    - ✓ **Gudha Mandapa** (the shrine hall) based on inverted lotus base plinth,
    - ✓ **Sabha Mandapa** or Sita Chavadi (the assembly hall) standing on 52 pillars signifying 52 weeks in a year, and
    - ✓ **Surya Kunda** or Ram Kunda (the reservoir) containing 108 shrines.

- In **2014**, it was declared a **UNESCO World heritage Site**.
- **Linked Festivals:** **Uttarardha Mahotsav**, celebrated in January.



### 8.3.2. NOBEL PRIZE IN LITERATURE

- The 2022 Nobel Prize in Literature was awarded to **French author Annie Ernaux** for her work that sheds light on the **murky recesses of memory, family, and society**.
- The Nobel Prize in Literature is awarded by the **Swedish Academy, Stockholm, Sweden**.
- **Rabindranath Tagore** was the **first Indian** and non-European to win the **Nobel Prize in Literature in 1913**.

### 8.3.3. NOBEL PEACE PRIZE 2022

- **Norwegian Nobel Committee** has decided to award the Nobel Peace Prize for 2022 to **one individual and two organisations**:
  - Human rights advocate **Ales Bialiatski from Belarus**,
  - Russian human rights organisation **Memorial** and
  - Ukrainian human rights organisation **Center for Civil Liberties**.
- They were awarded for their consistent efforts in favour of **humanist values, anti-militarism and principles of law**.
- Nobel Peace Prize is awarded by a committee elected by the Norwegian Parliament.

### 8.3.4. NANSEN REFUGEE AWARD

- **Angela Merkel**, former Chancellor of Germany, has won 2022 **UNHCR Nansen Refugee Award for protecting refugees** at Syria crisis.
- Award, established in 1954, honor **individuals, groups or organizations** who go above and beyond call of duty to protect refugees, internally displaced or stateless people.
  - It is named after Norwegian explorer, scientist, diplomat and humanitarian **Fridtjof Nansen**.
  - He was **first High Commissioner for Refugees for League of Nations** and won **Nobel Peace Prize in 1922**.
  - **First Laureate: Eleanor Roosevelt**, first chair of the **UN** in 1954.



**SMART QUIZ**

You can scan this QR code to practice the Smart Quiz of Culture at our open test online platform for testing your understanding and recalling of the concepts.





# 9. ETHICS

## 9.1. SOCIAL MEDIA AND CIVIL SERVANTS

### Introduction

“Don’t fall into ‘Singham’ trap. Police uniform is not associated with authority and awe but inspires pride.” – Prime Minister. This was spoken in the context of Civil Servants turning into Instagram celebrities. At the same time, IAS officer and collector Prasanth Nair used his social media influence to gather volunteers for cleaning up a lake in Kerala.

### How have Civil Servants been using Social Media?

Very broadly, social media can be defined as any web or mobile based platform that enables an individual or agency to communicate interactively and enables exchange of user generated content. E.g., Meta, Twitter, Instagram etc.

The advent of social media is transforming the manner in which information is shared and distributed. Civil Servants have generally been using it in the following ways:

- **Connecting with citizens:** Civil Servants use social media to create a personal connect with citizens. This could increase public participation, build trust, and increase popularity of the concerned civil servant.
- **Sharing information and improving awareness:** Public officials including civil servants share details of government schemes, latest policy updates, regulations etc. E.g., Delhi Traffic Police creating traffic law awareness through memes.
- **Understanding public viewpoint:** Social Media acts as database of public opinion. Many times it is used by Civil Servants to gauge feedback on policies and programmes. Also, social media discussions reflect underlying issues like castism, communalism, and sexism among others.
- **Personal usage:** Beyond official capacity, Social Media is also used by Civil Servants in personal capacity for expressing personal opinion and sharing other content.










### What makes Social Media different?

- **Connectedness:** Ability to connect and re- connect like-minded people.
- **Collaboration:** These connections enable people to collaborate.
- **Community:** Connectedness and collaboration helps create and sustain communities.

### What do All India Services (Conduct) Rules, 1968 say?

It highlights that **no member of the services should make a statement on any public media-**

- which has the effect of an **adverse criticism of any current or recent policy or action** of the Central Government or a State Government.
- which is **capable of embarrassing the relations between the Central Government and any State Government.**
- which is **capable of embarrassing the relations between the Central Government and the Government of any Foreign State.**

DUALITY OF CIVIL SERVANTS ROLE		
 Civil Servant Role	 Bureaucratic	 Media
 Setting	Backstage	Frontstage
 Personal front	None Behind the scenes role (Anonymous)	Personalization, Frontstage role, "Whole" person sharing personal stories
 Authenticity	Impartial expert, Emotion-free, Zero-error performing bureaucrat	Empathic person/ability to show emotions, Understanding of ordinary peoples' lives
 Impression management	Neutral "machine"	Human being, Expertise with a flaw: human errors and insecurities as part of role
 Legitimacy	Expertise	Popularity, likability (SoMe likes)
 Identity	Clear-cut distinction between work/personal identities	Hybrid identity: work/personal identities inseparable ★

Usage of Social Media by Civil Servants creates a Role for Civil Servants in media realm in addition to their bureaucratic role.

Having this dual role sometimes helps in improving governance. But sometimes, the media role runs counter to the traditional bureaucratic role. Following can be cited as merits and demerits of the same-

Merits of using social media by civil servants	Demerits of using social media by civil servants
<ul style="list-style-type: none"> <li>• <b>Accessible to the Common People:</b> Civil servants have become accessible to the common people. For example, during Covid-19 pandemic, many civil servants were accessible to citizens through social media.</li> <li>• <b>Public service delivery</b> issues have been resolved using of social media.</li> <li>• <b>Better policy making:</b> Opinions and feedback from Social Media can enable Data based policymaking.</li> <li>• <b>Create a Positive outlook:</b> Social media has also been used to create a positive outlook towards an institution long perceived as opaque and inaccessible.</li> <li>• <b>Awareness:</b> Social media provides a platform to keep the general public informed and updated about important issues and engage with an audience on a deeper level.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Principle of Neutrality and Anonymity:</b> Civil Service values suggest that officers be politically neutral and work 'behind the curtains'. They must keep themselves away from being recognized publicly or appreciated for that matter, contrary to what social media provides.</li> <li>• <b>Inconsistent with the parliamentary form of government:</b> In a parliamentary form of government, the ministers are directly responsible to the people through their elected representatives and bureaucrats are only accountable to their line of authority.</li> <li>• <b>It can blur the distinction between an individual's professional and private identity:</b> Actions online are easily visible to colleagues, employers, and the general public, thus making it difficult to separate professional and personal selves.</li> <li>• <b>Undue self-promotion:</b> Fame is sometimes used by civil servants for self-promotion. Many Civil Servants post about their work. These posts are then promoted by their fans and followers, creating a public narrative of their performance.</li> </ul>

### What can be done to ensure effective use of social media by civil servants?

Following core values have been suggested by Department of Electronics and Information Technology social media presence and interaction of civil servants:

- **Identity:** Always identify clearly who you are, what is your role in the department and publish in the first person. Disclaimer may be used when appropriate.
- **Authority:** Do not comment and respond unless authorized to do so especially in the matters that are sub-judice, draft legislations or relating to other individuals.
- **Relevance:** Comment on issues relevant to your area and make relevant and pertinent comments. This will make conversation productive and help take it to its logical conclusion.
- **Professionalism:** Be Polite, Be Discrete and Be Respectful to all and do not make personal comments for or against any individuals or agencies. Also, professional discussions should not be politicized.
- **Openness:** Be open to comments – whether positive or negative. It is not necessary to respond to each and every comment.
- **Compliance:** Be compliant to relevant rules and regulations. Do not infringe upon IPR, copyright of others.
- **Privacy:** Do not reveal personal information about other individuals as well as do not publish your own private and personal details unless you wish for them to be made public to be used by others.

### Conclusion

Civil Servants when using the social media are **de facto representatives of government**. In this context, they are expected to uphold as well as project the civil services values such as **fairness, integrity, transparency, and courage among others**. Therefore, every post by any civil servant has to be contextually relevant and has to pass the litmus test of ethics of public service.

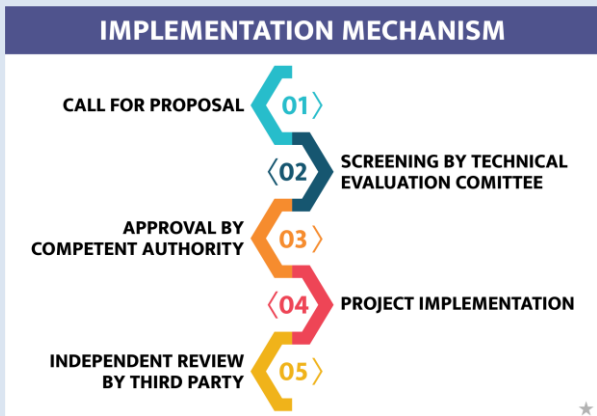
# 10. SCHEMES IN NEWS

## 10.1. TELECOM TECHNOLOGY DEVELOPMENT FUND SCHEME

### Why in news?

Recently, the Universal Service Obligation Fund (USOF) launched Telecom Technology Development Fund scheme

Objectives	Salient Features
<ul style="list-style-type: none"> <li>To <b>bridge digital divide</b> by developing and manufacturing the state-of-the-art technologies for rural and remote areas.</li> <li>To <b>fund R&amp;D in rural-specific communication technology applications</b>.</li> <li><b>Bridge the gap between R&amp;D and commercialization</b> of products and solutions.</li> <li><b>Create synergies among the Academia, Research Institutes, Start-ups</b> and Industry for capacity building and development of telecom ecosystem through outreach to build rural / remote areas relevant technologies and solutions</li> <li>To <b>promote technology ownership and indigenous manufacturing</b>, create a culture of technology co-innovation, reduce imports, boost export opportunities and creation of Intellectual Property.</li> </ul>	<ul style="list-style-type: none"> <li>USOF, a body under the <b>Department of Telecommunications, officially launched Telecom Technology Development Fund (TTDF) Scheme</b> on October 01st, 2022.</li> <li>It is aimed for <b>domestic companies and institutions involved</b> in technology design, development, commercialization of telecommunication products and solutions, <b>to enable affordable broadband and mobile services in rural and remote areas.</b> <ul style="list-style-type: none"> <li>Entities are encouraged to <b>collaborate with other domestic companies, academia, R&amp;D institutions etc.</b>, as may be necessary while executing the project at any stage.</li> </ul> </li> <li><b>Standardization:</b> Under the scheme, USOF is <b>targeting to develop standards</b> to meet countrywide requirements and create the ecosystem for research, design, prototyping, use cases, pilots, and proof of concept testing, among others.</li> <li><b>Funding:</b> Apart from the existing R&amp;D funding mechanisms, an <b>allocation of 5% of annual collections</b> from USOF will be available for funding R&amp;D in the Telecom sector, starting with the funds collected in the financial year 2021-22.           <ul style="list-style-type: none"> <li>It entails grants to Indian entities to <b>encourage and induct indigenous technologies</b> tailor-made to meet domestic needs.</li> </ul> </li> <li><b>IPR:</b> The scheme also intends <b>creation of Intellectual Property Rights.</b></li> </ul>



## 10.2. PRADHAN MANTRI KISAN SAMMAN NIDHI SCHEME (PM-KISAN)

### Why in news?

Recently, the Government released the 12th instalment amount of Rs. 16,000 crores under the PM-KISAN through Direct Benefit Transfer.

Objectives	Salient Features
<ul style="list-style-type: none"> <li>To provide <b>income support to all land holding eligible farmer families.</b></li> <li>To <b>supplement the financial needs of the farmers in procuring various inputs</b> to ensure</li> </ul>	<ul style="list-style-type: none"> <li>It is a <b>Central Sector Scheme</b> of Government of India to augment the income of all the land holding farmers of the country.</li> <li>It has become operational from December 2018.</li> <li>It allows <b>land-owning eligible farmer families to receive ₹6,000 per year in three equal installments of ₹ 2,000 each</b>, every four months.           <ul style="list-style-type: none"> <li>Definition of <b>family for the scheme is husband, wife and minor children.</b></li> </ul> </li> <li>There are <b>various Exclusion Categories for the scheme.</b></li> <li><b>Exclusions:</b> <ul style="list-style-type: none"> <li>All Institutional Land holders.</li> <li>Farmer families with member(s) belonging to following categories: (see image)</li> </ul> </li> <li>The installment is <b>transferred directly to the beneficiaries' bank accounts.</b></li> </ul>



proper crop health and appropriate yields, commensurate with the anticipated farm income.

- The benefit shall be paid to **only those farmers' families whose names are entered into the land records except for Forest dwellers, North-eastern states and Jharkhand** which has separate provisions for land records.
- Under the PM-KISAN Scheme, **funds are not allocated and sanctioned State-wise.**
- Responsibilities of identification of beneficiary farmers families rest with the state/UT government.
- **Self-registration Mechanism:** Process of Self-registration of beneficiaries has been made simple and easy through mobile app, PM KISAN portal and walk-ins via Common Service Centers to give the maximum benefit to the farmers.
- **Physical Verification Module:** To maintain the authenticity and validity of the scheme, a mandatory physical verification of 5% beneficiary every year is being done as per the provisions laid down in the scheme.
- **Demographic Aadhar authentication:** Aadhar validation has been made compulsory to make whole process more transparent.
- **Income Tax verification:** The beneficiary database in this scheme is being regularly validated with income tax payee database to have an audited and authenticated user base.
- **All PM-KISAN beneficiaries will be given the Kisan Credit Cards (KCC)** so that farmers can take easy loans from the banks.
  - This will help all such farmers to get short term loan for crop and animal/fish rearing at a maximum interest of 4% on timely repayment.

### Excluded Categories

 **Constitutional Position Holders**

- Former and present holders of constitutional posts

 **MPs, MLAs etc.**

- Former & present ministers
- Former/present Members of LS/RS/State Legislative Assemblies/Councils
- Former & present Mayors of Municipal Corporations or Chairpersons of District panchayats

 **Serving/Retired Government Officials**

- Employees of Central/State Government Ministries, Departments and its field units
- Central or state PSEs and Autonomous Institutions under Government
- Regular employees of the Local Bodies

 **Working Professionals**

- Doctors
- Engineers
- Lawyers
- Chartered Accountants and Architects etc. registered with Professional bodies
- Persons who paid Income Tax in last assessment year




 **Pensioners**

- Superannuated/retired pensioners with monthly pension  $\geq$ Rs. 10,000/ (Excluding MTS/Group - W/Group D employees)
- All Persons who paid Income Tax in last assessment year







# 11. APPENDIX


## APPENDIX: NUMISMATIC HISTORY OF INDIA

### ANCIENT INDIA COINAGE






Key Features	Image (Obverse and reverse)	
<p><b>Punch marked coins (issued between the 7th-6th century BC and 1st century AD)</b></p> <ul style="list-style-type: none"> <li>⊖ <b>First documented coinage</b> is deemed to start with '<b>Punch Marked</b>' coins. These coins are called so because of their manufacturing technique i.e., symbols were <b>punched on the coin</b> with a separate punch.</li> <li>⊖ They are <b>broadly classified into two periods</b>: First period (attributed to the <b>Janapadas or small local states</b>) and the second period (attributed to the <b>Imperial Mauryan period</b>).</li> </ul>	Seven Symbols	
	Five Symbols	
	Five Symbols	

### DYNASTIC COINS

Dynasty	Key Features	Image (Obverse and reverse)
<b>Kushan</b>	<ul style="list-style-type: none"> <li>⊖ Introduced <b>gold and copper</b> coins.</li> <li>⊖ Generally depicted iconographic forms drawn from <b>Greek, Mesopotamian, Zoroastrian and Indian mythology</b>.</li> <li>⊖ <b>Siva, Buddha and Kartikeya</b> were the major Indian deities portrayed.</li> </ul>	
<b>Satavahana</b>	<ul style="list-style-type: none"> <li>⊖ Coins are made up of <b>Copper, Silver, Lead and Potin</b> in different shapes.</li> <li>⊖ Coins carry <b>symbols, motifs, portraits and legends</b>.</li> <li>⊖ Carried the <b>motifs of fauna</b> like elephants, lions, bulls, horses, etc. often juxtaposed against <b>motifs from nature</b> like hills, tree, etc.</li> </ul>	
<b>Western Kshatrapa</b>	<ul style="list-style-type: none"> <li>⊖ Legends on the coins were generally in <b>Greek and Brahmi</b>. Kharoshti too was used.</li> <li>⊖ The Western Kshatrap coins are reckoned to be the <b>earliest coins bearing dates</b>.</li> </ul>	
<b>Other coins (between Post-Mauryan and Gupta phase)</b>	<ul style="list-style-type: none"> <li>⊖ Various <b>tribal republics</b> in the Punjab and <b>monarchies in the Indo-Gangetic plain</b> issued coins.</li> <li>⊖ The <b>coins of the Yaudheyas</b> were <b>influenced in design and motif</b> by the coins of the <b>Kushans</b> and followed the <b>weights of the Indo-Bactrian rulers</b>.</li> </ul>	
<b>Gupta coinage</b>	<ul style="list-style-type: none"> <li>⊖ Followed the tradition of the Kushans, depicting the <b>king on the obverse and a deity on the reverse</b>; the deities were Indian and the legends were in <b>Brahmi</b>.</li> <li>⊖ Coins often <b>commemorate dynastic succession</b> as well as significant <b>socio-political events</b>, like marriage alliances, the horse sacrifice, etc.</li> </ul>	
<b>Post-Gupta coinage</b>	<ul style="list-style-type: none"> <li>⊖ Highly artistic <b>gold and silver coins</b> of the Indo-Greeks, Kushanas and Guptas were replaced by <b>base silver, copper and mixed metal coinages</b>.</li> <li>⊖ <b>Bull &amp; Horseman</b> type of coins were the most common motif appearing on coins <b>struck by the Rajput clans</b>.</li> </ul>	

<p><b>South Indian Coinage</b></p>	<ul style="list-style-type: none"> <li>⊖ The symbols and motifs were confined to <b>dynastic crests such as the boar (Chalukya), bull (Pallava), tiger (Chola), fish (Pandya and Alupas), bow and arrow (Cheras) and lion (Hoysala) etc.</b></li> <li>⊖ <b>Yadavas of Devagiri</b> issued 'Padmatankas' with an eight-petalled lotus on the obverse and a blank reverse.</li> <li>⊖ <b>Decorative features are rare</b> and divinities are almost absent till the medieval Vijayanagar period (14th- 16thcenturies AD).</li> </ul>	
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## **MEDIEVAL INDIA COINAGE**

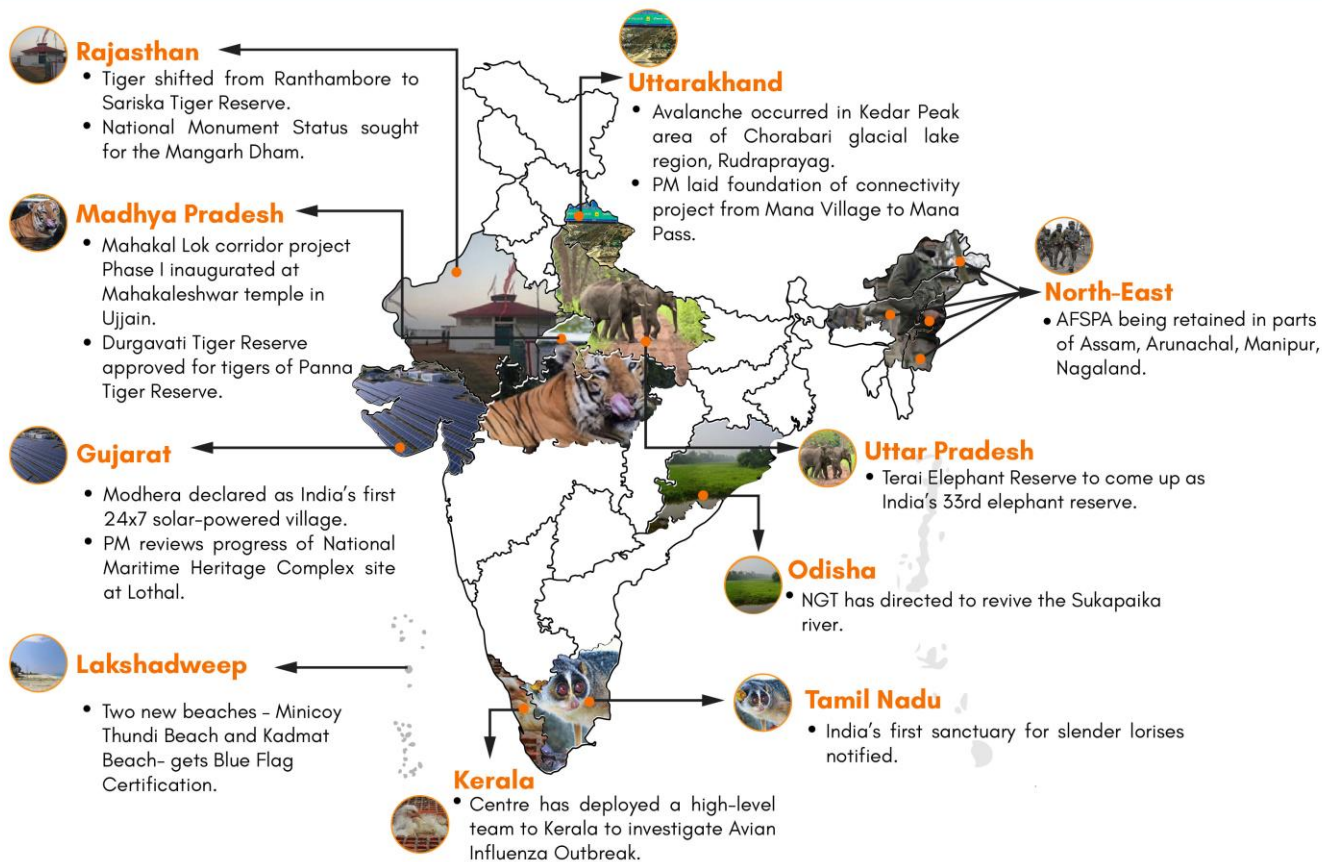
Dynasty/Empire	Key Features	Image
<p><b>Delhi Sultanate</b></p>	<ul style="list-style-type: none"> <li>⊖ Coins were struck in <b>gold, silver and copper.</b></li> <li>⊖ Khilji rulers issued coins in abundance with <b>grandiloquent titles</b> (Ala-ud-din Khilji struck coins assuming the title 'Sikandar al Sani', the second Alexander).</li> <li>⊖ <b>Gold coins</b> were issued in very large numbers during the reign of <b>Muhammed bin Tughlaq</b>, thereafter gold coins became scarce.</li> <li>⊖ By the time of the <b>Lodhis</b>, coins were struck almost <b>exclusively of copper and billon.</b></li> </ul>	<p><b>Coin of Ghiyasu-d-din Balban 1266 - 1287 AD</b></p>  <p><b>Coins of Khiljis</b></p> 
<p><b>Vijayanagar Empire</b></p>	<ul style="list-style-type: none"> <li>⊖ Coins were largely struck in <b>gold and copper.</b></li> <li>⊖ Most Vijayanagar gold coins bore a <b>sacred image</b> on the obverse and the <b>royal legend</b> on the reverse.</li> <li>⊖ Amongst the <b>significant gold coins of the Vijayanagar Empire were those bearing the image of the deity of Tirupati, i.e., Lord Venkatesvara</b> represented either singly or with his two consorts.</li> </ul>	
<p><b>Mughals</b></p>	<ul style="list-style-type: none"> <li>⊖ Mughal coinage was largely the <b>creation of Sher Shah Suri</b>, an Afghan, who ruled for a brief time in Delhi. Sher Shah issued a <b>coin of silver</b> which was termed the <b>Rupiya</b>, precursor of the <b>modern rupee</b>. It remained <b>largely unchanged</b> till the early 20thCentury.</li> <li>⊖ Together with the silver Rupiya were issued <b>gold coins called the Mohur</b> and copper coins called <b>Dam</b>.</li> <li>⊖ Mughal Coinage reflected <b>originality and innovative skills.</b></li> </ul>	<p><b>One Rupee- Sher Shah Suri (Afghan)</b></p>  <p><b>Mohur-Aurangzeb</b></p> 

## **BRITISH INDIA COINAGE**

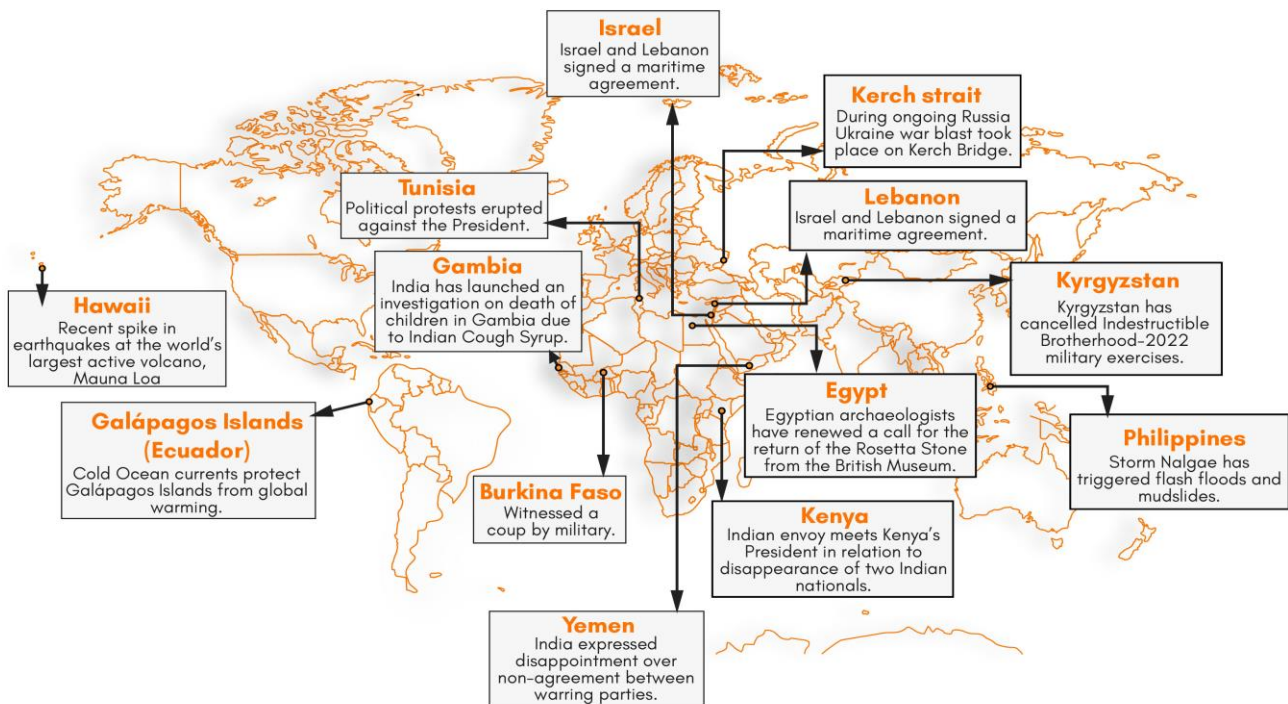
<ul style="list-style-type: none"> <li>⊖ Gold coins were termed <b>Carolina</b>, the silver coins <b>Anglina</b>, the copper <b>coins Cupperoon</b> and tin coins <b>Tinny</b>. Enactment of <b>Coinage Act of 1835</b> led <b>uniform coinage</b> to be issued.</li> <li>⊖ Newly designed coins with the <b>effigy of Prince William IV</b> on the obverse and the value on the reverse in English and Persian, were issued in 1835. Coins issued after 1840 <b>bore the portrait of Queen Victoria</b>.</li> <li>⊖ The <b>Indian Coinage Act, 1906</b> governed the <b>establishment of Mints as well as the coins</b> that would be issued and the standards that would be maintained.</li> </ul>
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# Places in News: India



# Places in News: World





## Personalities in News

Personality	About	Ethical values exhibited by the personality
 <p><b>Sri Guru Ram Das (1534 - 1581)</b></p>	<ul style="list-style-type: none"> <li>Guru Ramdas was the fourth Guru of the Sikhs and also the son-in-law of the third Guru, <b>Amar Das</b>.</li> <li><b>Contributions</b> <ul style="list-style-type: none"> <li>Laid the <b>foundations of Ramdaspur</b> (later renamed to Amritsar) on the land donated by Mughal emperor Akbar</li> <li><b>Strengthened the institution of langar</b> (community kitchen) and <b>manjis</b> (missionary centres)</li> <li><b>Composed 'Anand Karaj'</b> which is the basis of the Sikh wedding ceremony.</li> </ul> </li> </ul>	<p><b>Humility and Service to others</b></p> <ul style="list-style-type: none"> <li>On land given to him by the Mughal emperor Akbar, he built a holy tank, or pool, and then, wishing to build a community around it, he invited merchants and traders to settle there.</li> </ul>
 <p><b>Raskhan or Syed Ibrahim Khan</b></p>	<p><b>Raskhan or Syed Ibrahim Khan</b></p> <ul style="list-style-type: none"> <li>Uttar Pradesh government has redeveloped the tombs of <b>Raskhan and Taj Bibi</b> in Mathura as a tourist complex. <ul style="list-style-type: none"> <li>Taj Bibi is also known as the '<b>Mughal Mirabai</b>'.</li> <li>She was daughter of a <b>Muslim</b> nobleman, appointed by Mughals to protect Gokul area.</li> <li>She renounced everything in the love of <b>Lord Krishna</b>.</li> </ul> </li> <li><b>He was 16<sup>th</sup> century</b> Sufi Muslim poet.</li> <li>He accepted Lord Krishna as the Supreme God and <b>became a Vaishnavite</b>.</li> <li>He spent his life in <b>Vrindavan</b>.</li> <li><b>Sujana Raskhana, Premavatika, Danalila</b> are some of his <b>Khariboli writings</b>.</li> </ul>	<p><b>Devotion and spiritualism</b></p> <ul style="list-style-type: none"> <li>He became a follower of Krishna and spent his life in Vrindavan.</li> <li>Raskhan is widely acknowledged as a great poet, having dedicated most of his creations to Lord Krishna.</li> </ul>
 <p><b>Begum Samru (1750's - 1836)</b></p>	<ul style="list-style-type: none"> <li>She was a Muslim who converted to Catholicism and came to be popularly known as the <b>only Catholic queen of India</b>.</li> <li>Her birth name was Farzana, and she spent her early years as a dancing girl in Delhi.</li> <li>After marrying an Austrian mercenary, who got <b>jagir (land tenureship) of Sardhana</b>, in present day Meerut district, she began to play an essential role in managing Sardhana and its land revenue dealings etc.</li> <li>For her <b>support to Mughal empire</b>, she was <b>bestowed the title Zeb-un-nissa by emperor Shah Alam and honoured with a khilat (ceremonial robe)</b>.</li> </ul>	<p><b>Free spirit and Courage</b></p> <ul style="list-style-type: none"> <li>From a 10-year-old penniless orphan, the begum traversed a long journey. She was trained as a dancer by the famous courtesan, Khanum Bai, she was adopted by the Mughal emperor, owned her own private army, and ruled an estate in Sardhana.</li> </ul>
 <p><b>Shyamji Krishna Varma (1857-1930)</b></p>	<p><b>Contributions</b></p> <ul style="list-style-type: none"> <li><b>Born in modern-day Gujarat, he had founded</b> <b>Indian Home Rule Society, India House in London</b>, to carry out anti-British activities.</li> <li><b>Propagated cause of India's independence</b> through his writings in his publication journal called "<b>Indian Sociologist</b>".</li> <li>In 1905, he was barred from practising law by Inner Temple (a professional associations for barristers in London) following <b>charges of sedition</b> for writing against colonial government.</li> <li>In face of criticism by British, he <b>shifted his base from England to Paris and continued his movement</b>.</li> </ul>	<p><b>Patriotism and Selflessness</b></p> <ul style="list-style-type: none"> <li>Inspired by the ideas of National liberation, he decided to dedicate his whole life for working to hold the cause of independent nation.</li> </ul>
 <p><b>Jayaprakash Narayan (1902-1979)</b></p>	<p><b>Contributions</b></p> <ul style="list-style-type: none"> <li>He was an Indian <b>Freedom fighter, theorist, socialist and political leader</b>.</li> <li>He was <b>founding member of the Congress Socialist Party</b>, formed in 1934, within the Congress Party.</li> <li>In 1948 he, together with most of the Congress Socialists, left the Congress Party and <b>in 1952 formed the Praja Socialist Party</b>.</li> <li>In mid-1970s, he <b>called for total revolution</b> against the then central government.</li> </ul>	<p><b>Integrity and Simplicity</b></p> <ul style="list-style-type: none"> <li>He was immensely popular among youth due to his strength of character, simple life and principled position in politics.</li> <li>He was the crusader for clean polity in India. His call for total revolution against corruption led to great awareness among masses about democratic institutions.</li> </ul>

Personality	About	Ethical values exhibited by the personality
 <p><b>Nanaji Deshmukh</b> (October 11, 1916 to 2010)</p>	<p><b>Contributions</b></p> <ul style="list-style-type: none"> <li>• <b>Chandikadas Amritrao Deshmukh</b> also known as Nanaji Deshmukh was a <b>social reformer and politician</b>.</li> <li>• He worked in the fields of education, health, and rural self-reliance.</li> <li>• He established <b>Chitrakoot Gramodya Vishwavidyalaya</b>, India's <b>first rural university</b> and also served as its first Chancellor.</li> <li>• Honours: Padma Vibhushan, Dnyaneswar award, and Bharat Ratna.</li> </ul>	<p><b>Commitment to the cause</b></p> <ul style="list-style-type: none"> <li>▪ A social reformer and politician from India, he worked in the fields of education, health, and rural self-reliance which showed the way for a new paradigm of empowering those living in villages.</li> </ul>
 <p><b>Dr. K.R. Narayanan</b> (1920- 2005)</p>	<p><b>Dr. K.R. Narayanan (1920- 2005)</b></p> <ul style="list-style-type: none"> <li>• Dr. Narayanan <b>served as the 10th President of India</b> from 1997 to 2002 and was also the <b>First Dalit President of India</b>.</li> <li>• He was also the <b>ninth Vice President of India from 1992 to 1997</b>.</li> <li>• He earlier served as ambassador to various countries.</li> <li>• He was the <b>first President to vote in the 1998 general elections</b>. Before him, India's Presidents refrained from adult suffrage.</li> </ul>	<p><b>Dedication and Scholarship</b></p> <ul style="list-style-type: none"> <li>▪ He sought to end violence and corruption and improve international relations</li> <li>▪ An intellectual and a scholar, Narayanan was the author or co-author of several works on Indian politics and international relations, notably <i>India and America: Essays in Understanding</i> (1984) and <i>Non-Alignment in Contemporary International Relations</i> (1981).</li> </ul>
 <p><b>Dr. APJ Abdul Kalam</b> (1931- 2015)</p>	<ul style="list-style-type: none"> <li>• Born in Tamil Nadu's <b>Rameswaram</b>.</li> <li>• Popularly known as <b>People's President and 'Missile Man'</b>.</li> <li>• He studied physics and aerospace engineering and was the <b>11th President</b> of the country from 2002 and 2007.</li> <li>• <b>Contributions</b> <ul style="list-style-type: none"> <li>▶ Key role in <b>Pokhran-II nuclear tests</b> which made India a nuclear power.</li> <li>▶ Responsible for the <b>development of Indigenous Guided Missiles at DRDO</b></li> <li>▶ In ISRO, he was the project director of India's first <b>Satellite Launch Vehicle (SLV-III)</b></li> </ul> </li> <li>• <b>Awards:</b> Padma Bhushan (1981), Padma Vibhushan (1990) Bharat Ratna (1997).</li> </ul>	<p><b>Vision and Simplicity</b></p> <ul style="list-style-type: none"> <li>▪ He significantly contributed to the development of rockets in India. His vision helped him to lead projects with great outcomes.</li> <li>▪ He lived a very simple and pious life. His life and thoughts has continued to inspire generations to come.</li> </ul>
 <p><b>Dilip Mahalanabis</b> (1934-2022)</p>	<ul style="list-style-type: none"> <li>• An Indian physician who while working at refugee camps during the 1971 Bangladesh Liberation war, <b>came up with Oral Rehydration Solution (ORS)</b>. <ul style="list-style-type: none"> <li>▶ ORS is a <b>combination of water, glucose and salts</b>, is a simple and cost-effective remedy for dehydration.</li> <li>▶ <b>WHO has adopted ORS as the standard method</b> for treating <b>cholera and other diarrhoeal diseases</b>.</li> <li>▶ The Lancet called it <b>"the most important medical discovery of the 20th century."</b></li> </ul> </li> <li>• In 2002, he was awarded the <b>Pollin Prize (considered the equivalent of Nobel in pediatrics)</b> by Columbia University.</li> </ul>	<p><b>Scientific aptitude and Knowledge</b></p> <ul style="list-style-type: none"> <li>▪ He consistently contributed through his research and pioneered the practical use of ORS on a large scale</li> <li>▪ He founded the research organisation Society for Applied Studies (SAS) and later expanded to include the New Delhi-based Centre for Health Research and Development, Society for Applied Studies (CHRD-SAS).</li> </ul>







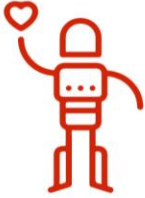
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# WEEKLY FOCUS

Holistic coverage of an issue every week

ISSUE	DESCRIPTION	LEARN MORE
 <p><b>Research and Development Ecosystem in India: Harnessing Innovation for Growth</b></p>	<p>The cutting-edge innovations currently taking place in the country have garnered the interest of international investors looking to leverage Indian ingenuity. But at the same time, India's spending R&amp;D is among the lowest in the world. This brings to the fore the need to understand nuances of R&amp;D ecosystem in India. This document while analysing the roadblocks, puts light on the way ahead for India to realise its true potential and emerge as a global R&amp;D platform.</p>	
 <p><b>Rural Industrialisation: Stepping Stone for an Atmanirbhar Bharat</b></p>	<p>India lives in villages. The country's progress is possible only through overall development of villages and for that, rapid rural industrialisation is the need of the hour. While this idea is not new, the recent push for Aatma Nirbhar Bharat has reignited the need. This document examines the significant steps taken to support the development of rural industries in India. It also analyses the hurdles that these industries continue to face and suggests the best way forward to unlock the growth potential of rural India.</p>	
 <p><b>India's Third Gender: From recognition to emancipation</b></p>	<p>How many times have you seen only two options for gender but what if someone doesn't belong to any of these two? While Article 14 of the Indian Constitution guarantees equality to "all persons", social constructs have made things difficult for persons who do not fit into any of the socially identified gender categories of male or female. This document examines the stigma and marginalisation faced by third gender communities in India and discusses the needed measures to ensure the upliftment of this long ignored community.</p>	
 <p><b>Ethics of Emerging Technology: Magna Potentia, Magna Responsabilis</b></p>	<p>While the desire to innovate leads emerging technologies to develop at a galloping pace, it is important to remember that they can lead to catastrophic results in the absence of clear regulations, laws and ethical guidelines in the relevant industries. This document explores the ethical dimensions and issues associated with a broad array of emerging technologies and discusses the imperatives for establishing ethical guidelines for the development and release of new and emerging technologies.</p>	