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**APRIL 2024**

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News Analysis



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# APRIL 2024

## 1. IMPORTANT TOPICS OF THE MONTH

### 1.1 Supreme Court Judgement on EVMs

#### Why in news?

Recently Supreme Court rejected the plea for 100% verification of Voter Verifiable Paper Audit Trail (VVPAT) slips against the Electronic Voting Machine (EVM) count

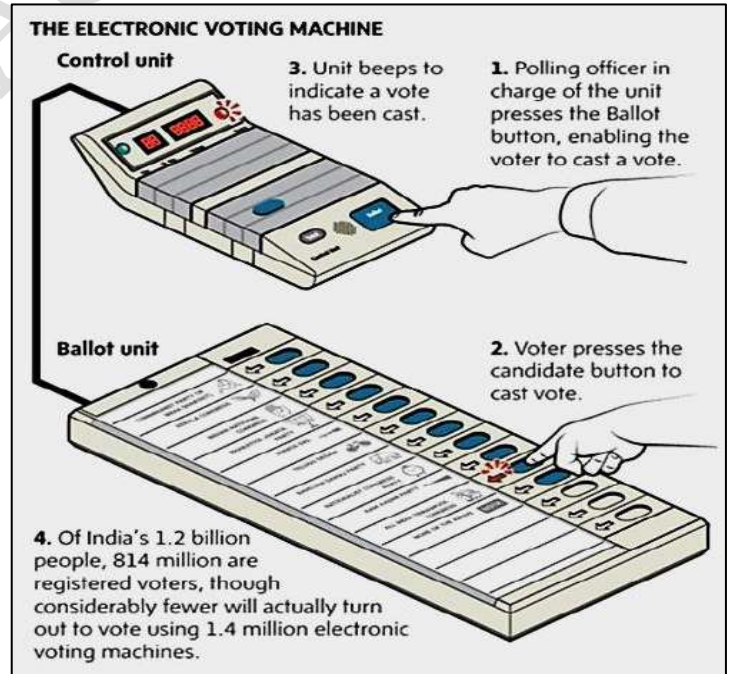
#### What are the features of Electronic Voting Machine?

- **Aim-** To make the voting process easier, faster, and more accurate.
- **About-** EVM is an electronic device for recording votes that consists of two Units

*By 2004 Lok Sabha elections, EVMs were used across all 543 constituencies.*

Control Unit	Balloting Unit
<ul style="list-style-type: none"> <li>• It is kept with the <i>Presiding Officer</i> or a <i>Polling Officer</i>.</li> <li>• The Polling Officer is in charge of the Control Unit presses the Ballot button on the Control Unit to release the ballot for the voter.</li> <li>• It can store the memory in its unit for 10 years or even more.</li> </ul>	<ul style="list-style-type: none"> <li>• It is placed inside the <i>voting compartment</i>, one balloting unit is designed for 16 candidates.</li> <li>• It is connected to Control Unit through 5 metre cable.</li> <li>• Once the ballot is released it enables the voter to cast their vote by pressing the ‘Candidate’ button (<i>blue button</i>) on the Balloting Unit against the candidate and symbol of their choice.</li> </ul>

- **Manufacturing-** It is designed by the Election Commission in collaboration with two Public Sector undertakings -
  - Bharat Electronics Limited, Bangalore (Ministry of Defence) and the
  - Electronics Corporation of India Limited, Hyderabad (Department of Atomic Energy).
- **Power-** EVMs operate on a 7.5-volt alkaline power pack, enabling their use *without electricity*.
- **Capacity-** Old EVMs can record up to 3840 votes, while newer models (post-2006) have a capacity of *2000 votes*
- **Trail of EVM-** In 1982 Electronic Voting Machine was first trailed in the Assembly constituency of **Paravur in Kerala**.
- **Widespread of EVM-** In 2001 EVMs are fully deployed across all booths during the Assembly elections in Tamil Nadu, Kerala, Puducherry, and West Bengal.



*VVPAT was first used in by-election for Noksen assembly seat in Nagaland.*

- **ETPBS-** Electronically Transmitted Post Ballot System is introduced in 2016 allowing service voters like members of the armed forces and government employees on election duty remotely.
- **NOTA-** In 2013, India became the 14th country to institute negative voting through None of the Above (NOTA). However, it is not a “right to reject”.

- **VVPAT-** The *Conduct of Elections Rules, 1961* were amended in 2013 to allow for a printer with a drop box to be attached to the EVM.
- **100% VVPAT backing-** The 2019 general elections saw EVMs backed with 100% VVPAT across all constituencies, ensuring an additional layer of verification for voters.
- **VVPAT counting-** As per Indian Institute of Statistics Election Commission in 2018 mandated counting of VVPAT slips of one randomly selected polling station per Assembly constituency.

### What are the benefits of Electronic Voting Machine?

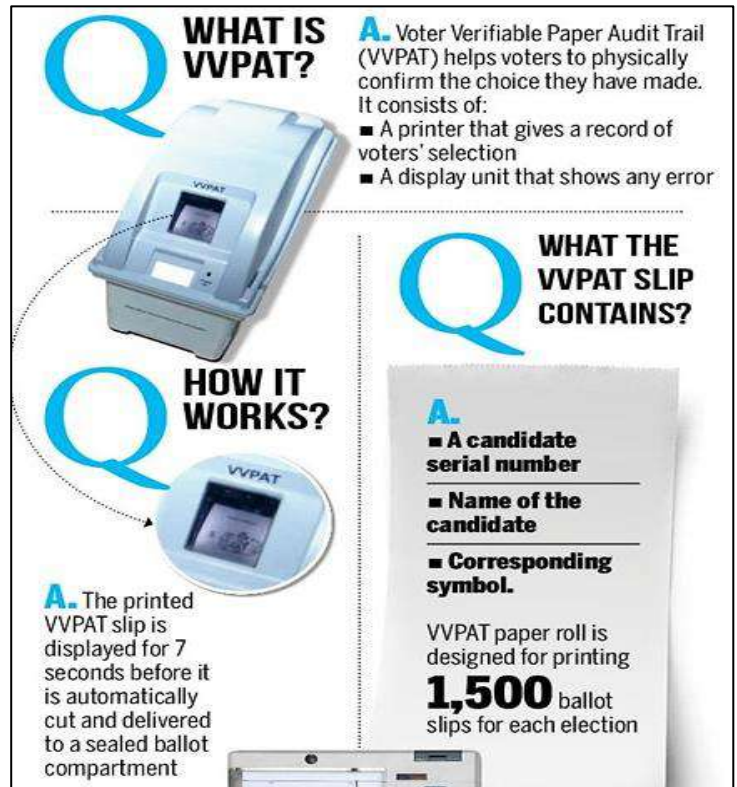
- **Booth capturing prevention-** EVMs have curtailed booth capturing by limiting the vote casting rate, making it more time-consuming to cast false votes.
- **Elimination of invalid votes-** The issue of invalid votes, which was a significant problem with paper ballots, has been addressed by EVMs.
- **Environmental benefits-** With a large electorate, EVMs are eco-friendly as they reduce paper consumption.
- **Administrative convenience-** EVMs provide ease for polling officers on election day and enable faster, error-free counting.
- **Random allocation-** EVMs are randomly allocated to booths before polls.
- **Mock polls-** They are conducted to demonstrate the accuracy of EVMs and VVPAT before actual polling begins.
- **Transparency-** Serial numbers of EVMs and the total votes polled are shared with candidates' agents for verification during counting.
- **Security-** The Election Commission of India (ECI) has repeatedly assured that EVMs are standalone devices without external connectivity, thus mitigating the risk of hacking.

### What are the challenges with EVMs?

- **Verifiability-** The current practice of matching EVM counts with VVPAT slips in five booths per assembly constituency/segment has been questioned for not being scientifically grounded, which could potentially overlook defective EVMs.
- **Susceptibility to hacking-** Various political parties and civil society activists have raised doubts about the security of EVMs, alleging that they are susceptible to hacking due to their electronic nature.
- **Voter privacy-** The current process allows for the identification of booth-wise polling behaviour by various political parties, they could potentially lead to profiling and intimidation of voters.
- **Lack of transparency-** The inner workings of these machines are not transparent enough, making it difficult to verify the accuracy of the voting process.
- **Lack of accessibility-** EVM poses challenges for certain segments of the population, such as elderly voters or those with disabilities.
- **High cost-** While EVMs are meant to streamline the voting process and reduce costs in the long run, the initial investment in procuring and maintaining these machines can be significant.

### What is the Supreme Court verdict on 100% counting of VVPAT slips?

- **Association of Democratic Reforms vs ECI and Anr. -** The petitioners demanded 100% verification of VVPAT slips or return to paper ballots.
- **Secure EVM-** The Supreme Court has reaffirmed the security of EVMs and VVPAT, rejecting pleas for a return to paper ballots.



**Q WHAT IS VVPAT?**

**A.** Voter Verifiable Paper Audit Trail (VVPAT) helps voters to physically confirm the choice they have made. It consists of:

- A printer that gives a record of voters' selection
- A display unit that shows any error

**Q HOW IT WORKS?**

**A.** The printed VVPAT slip is displayed for 7 seconds before it is automatically cut and delivered to a sealed ballot compartment

**Q WHAT THE VVPAT SLIP CONTAINS?**

**A.**

- A candidate serial number
- Name of the candidate
- Corresponding symbol.

VVPAT paper roll is designed for printing **1,500** ballot slips for each election

Key aspect	Petitioner's demand	Supreme Court's verdict
<b>Full cross verification</b>	<ul style="list-style-type: none"> <li>The petitioner argued that every voter should be able to verify that their vote has been counted properly after receiving confirmation that it has been cast.</li> <li>Currently, VVPAT slips are counted and matched with the EVM tally only in 5 random polling booths per constituency.</li> </ul>	<ul style="list-style-type: none"> <li>The court stated that while voters' right to know whether their vote has been recorded accurately doesn't equate to the right of 100% counting of VVPAT slips.</li> <li>Other measures like the 7 second display of VVPAT slips and the ability to approach the Presiding Officer in case of mismatches as per <i>Conduct of Election Rules, 1961</i> already protects voter's right.</li> </ul>
<b>Tampering with EVMs</b>	<ul style="list-style-type: none"> <li>As per report by the Citizens' Commission on Elections the petitioner argued there is a possibility of EVMs being tampered with or hacked.</li> <li>The commission is chaired by former Supreme Court judge Justice Madan B Lokur.</li> </ul>	<ul style="list-style-type: none"> <li>The court dismissed these concerns as unfounded, citing the unalterable nature of the microcontroller used in EVMs.</li> <li>The court directed additional measures such as checking the microcontroller for tampering upon request and sealing Symbol Loading Units along with EVMs for 45 days after results are declared.</li> </ul>
<b>EVM- VVPAT discrepancy</b>	<ul style="list-style-type: none"> <li>The petitioner submitted that the ECI had acknowledged instances of variance in the results captured by the EVM and VVPAT.</li> <li>Example- 2019 elections in the <i>Mydukur Assembly seat, Andhra Pradesh</i> the EVM recorded 14 more votes than the VVPAT.</li> </ul>	<ul style="list-style-type: none"> <li>The court held that aside from one case in Mydukur there was not a single case of mismatch in the recording of votes in any EVMs.</li> <li>This assertion was supported by data showing that even in 26 instances where voters reported mismatches, no actual discrepancies were found.</li> </ul>
<b>Giving VVPAT slip to voter</b>	<ul style="list-style-type: none"> <li>The petitioners argue that the current system, which allows voters to view the VVPAT slip for only seven seconds, could be susceptible to manipulation.</li> <li>They suggest that the machine could be programmed to not cut the slip, preventing it from being counted, and propose that the slip should instead be handed to the voter to place in a ballot box.</li> </ul>	<ul style="list-style-type: none"> <li>The court said that the purpose of the tinted glass above the VVPAT slip is to maintain the secrecy of the vote while still allowing the voter to verify their vote for seven seconds.</li> <li>The glass also serves to protect the slip from damage or tampering.</li> <li>The court reasoned that giving voters physical access to the VVPAT slips could lead to potential misuse, malpractices and disputes.</li> </ul>
<b>Return to paper ballot</b>	<ul style="list-style-type: none"> <li>The petitioner suggested this move, referencing countries like <i>Germany</i> that have returned to paper ballots.</li> <li>They also proposed the idea of adding <i>barcodes</i> to VVPAT slips to facilitate the use of counting machines and minimize delays in vote counting.</li> </ul>	<ul style="list-style-type: none"> <li>The court countered this suggestion by highlighting the benefits of Electronic Voting Machines (EVMs), which include preventing booth capturing, eliminating invalid votes, offering administrative convenience, and reducing the use of paper.</li> <li>The court did not provide an opinion on the barcode suggestion, stating that it is a technical matter for the ECI to decide.</li> </ul>

### What lies ahead?

- The Court acknowledged some concerns raised by the petitioners which suggested for sealing of SLUs and has allowed candidates to seek verification of EVM software, including the microcontrollers, in case of doubts regarding the results.
- This represents a significant shift in the handling and scrutiny of electoral technology in India.
- However, the Court ultimately upheld the integrity of EVMs and VVPATs, rejecting the need for full cross-verification and advocating for the continued use of electronic voting systems.

### Symbol Loading Unit

- It is a device used in the preparation of EVMs with Voter Verifiable Paper Audit Trail (VVPAT) for elections.
- **Loading candidates symbol-** Before an election, the list of contesting candidates and their symbols needs to be loaded onto the VVPAT machines through SLU.
- The SLU is connected to a laptop or personal computer, where a symbol loading application is used to load a bitmap file containing the candidates' names, serial numbers, and symbols.
- **Transferring to VVPAT-** Once the symbols are loaded onto the SLU, it is then transferred from the SLU to the VVPAT, ensuring that each VVPAT contains the correct symbols corresponding to the candidates.
- This is conducted under the supervision of a district election officer to maintain transparency and integrity.
- **Utility-** The SLU is used only a few days before polling in a particular seat, and after the symbols are loaded onto the VVPATs, the SLU is no longer relevant to the voting process.
- It is then handed over to the district election officer for safekeeping until the end of the election.
- **Recent directive-** The Supreme Court requires the Election Commission of India (ECI) to seal and secure SLUs for 45 days after the declaration of election results.
- This ensures that SLUs used in the election process can be examined along with EVMs if there are challenges to the election results.

## 1.2 India-EFTA Trade and Economic Partnership Agreement

### Why in news?

India-European Free Trade Association has signed a Trade and Economic Partnership Agreement (TEPA).

### What are trade agreements?

- Trade agreement is any contractual arrangement between states concerning their trade relationships.
- They may be bilateral or multilateral.
- It includes Free Trade Agreement (FTA), Preferential Trade Agreement (PTA), Regional Trade Agreement (RTA), etc.

### What is an FTA?

- A free trade agreement is an arrangement between two or more countries where they agree either to **end or reduce customs duties** on maximum number of goods traded between them, besides cutting down non-trade barriers on a significant value of imports.
- **Goal-** To facilitate cross-border transactions, increase investment prospects, promote mutual trade, and improve the ease of business.
- The **World Trade Organisation (WTO)** is the global watchdog for exports and imports-related issues. India has been a member since 1995.
- **Benefits of FTAs**
  - Zero-duty entry into partner country markets helps in the diversification and expansion of export markets.

INDIA'S TRADE AGREEMENTS			
Bilateral Agreements		Regional Agreements	
1. India-Sri Lanka FTA (2000)	6. India-Thailand EHS (2004)	1. India-ASEAN (2010) Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Singapore, Vietnam	
2. India-Japan CEPA (2011)	7. India-Chile PTA (2007)		
3. India-Korea CEPA (2010)	8. India-Afghanistan (2013)		
4. India-Malaysia CECA (2011)	9. India-Singapore CECA (2005)		
5. India-Nepal Trade Treaty (1950)	10. India-Bhutan Agreement on Trade & Transit (2016)		
<b>Unilateral DFTP Scheme (34 LDCs) (2008)</b>		2. Asia Pacific Trade Agreement (APTA) (1975)	Thailand, Bangladesh, China, Republic of Korea, Sri Lanka
Afghanistan, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Haiti, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Myanmar, Niger, Rwanda, Senegal, Somalia, Sudan, Timor Leste, Togo, Uganda, Tanzania, Yemen, Zambia		3. Agreement of South Asian Free Trade Area (SAFTA) (2006)	Bangladesh, Bhutan, Maldives, Nepal, Pakistan, Sri Lanka, Afghanistan
		4. India-MERCOSUR (2009)	Argentina, Brazil, Paraguay, Uruguay
		5. Global System of Trade Preference (1989)	47 Developing Countries

(As on Sept 2020)

- Level playing field vis-a-vis competitors who may have already entered FTAs with partner countries.
- FTAs enable preferential treatment in the partner country market over non-FTA member country competitors.
- Attracting foreign investment to stimulate domestic manufacturing.
- Access to raw materials, intermediate products and capital goods for value-added manufacturing.
- Long-term efficiency and consumer welfare goals.

### What is Trade and Economic Partnership Agreement (TEPA)?

- TEPA is a modern and ambitious Trade Agreement.
- The agreement has **14 chapters**, including trade in goods, rules of origin, intellectual property rights (IPRs), trade in services, investment promotion and cooperation, government procurement, technical barriers to trade and trade facilitation.

### Highlights of TEPA

- EFTA has committed to promote investments to
  - increase the stock of foreign direct investments **by USD 100 billion** in India in the next 15 years
  - facilitate the generation of **1 million direct employment** in India, through such investments (except foreign portfolio investment)
- EFTA covers **99.6%** of India's exports. The EFTA's market access offer covers **100%** of non-agri products and tariff concession on Processed Agricultural Products (PAP).
- India covers **95.3%** of EFTA exports of which more than 80% import is Gold.
- Sectors such as dairy, soya, coal and sensitive agricultural products are kept in exclusion list which means there won't be any tariff cuts by India on these sectors.
- TEPA has provisions for **Mutual Recognition Agreements in Professional Services** like nursing, chartered accountants, architects etc.
- Commitments related to Intellectual Property Rights in TEPA are at **TRIPS level**. India's interests in generic medicines and concerns related to evergreening of patents have been fully addressed.



*India runs a trade deficit with most of its top trade partners, except for the US. India also runs a trade deficit with EFTA at USD 14.8 billion in the last fiscal.*

### The European Free Trade Association (EFTA)

- **Origin** - It is the intergovernmental organisation founded by the Stockholm Convention in 1960.
- **Members** - Iceland, Liechtenstein, Norway and Switzerland.
- **Aim** - Promotion of free trade and economic integration between the members.
- **Committees** - EFTA has 3 committees with an advisory role whose mandate is to provide advice to its member states on all issues of relevance to the organisation.
  - The EFTA Parliamentary Committee
  - The EFTA Consultative Committee
  - The EEA EFTA Forum
- EFTA is one important economic block out of the 3 (other two - EU & UK) in Europe.
- Among EFTA countries, Switzerland is the largest trading partner of India followed by Norway.



## What is the significance of the deal?

### For EFTA Countries

- **Market access** - EFTA countries gain market access to a major growth market (India).
- **Diversify the supply chain** - India will strive to diversify the EFTA's supply chains while rendering them more resilient.

### For India

- **Attract FDI** - India will attract more foreign investment from EFTA, which will ultimately translate into an increase in good jobs.
- **Boost the service sector** - It is expected to stimulate India's services exports in sectors such as IT services, business services, sporting and recreational services, education services and audio-visual services.
- **Promote exports** - It will empower exporters access to specialized inputs and create conducive trade and investment environment thereby providing opportunities for services sector to access more markets.
- **Opportunity to integrate with EU** - TEPA paves way for Indian companies to look into Switzerland as a base for extending its market reach to EU.
- **Encourage domestic manufacturing** - TEPA will give impetus to "Make in India" and Atmanirbhar Bharat in sectors such as infrastructure, manufacturing, pharmaceuticals, chemicals, food processing, transport, financial services and insurance.
- **Creates employment** - TEPA would accelerate creation of direct jobs for India's young aspirational workforce, including better facilities for vocational and technical training.
- **Facilitates technology collaboration** - TEPA facilitates tech collaboration and access to world leading technologies in precision engineering, health sciences, renewable energy, Innovation and R&D.

### What are the issues?

- **Abolition of tariffs by Switzerland** - Switzerland, which is India's biggest trade partner among EFTA countries, decided to eliminate import duties on all industrial goods for all countries from January 1, 2024.
- This concerns India as industrial goods accounts for 98% of India's merchandise exports to Switzerland in 2023.
- **Agriculture tariffs** - Exporting agricultural produce to Switzerland remains challenging due to the complex web of tariffs, quality standards, and approval requirements.

## G.S PAPER I

### 2. GEOGRAPHY

#### 2.1 Dubai Flood

##### Why in news?

Recently a storm hit Oman and UAE, with UAE experiencing its heaviest rainfall in 75 years, raising questions about the role of cloud seeding in this unusual weather event.

##### Why Dubai experienced heavy rainfall?

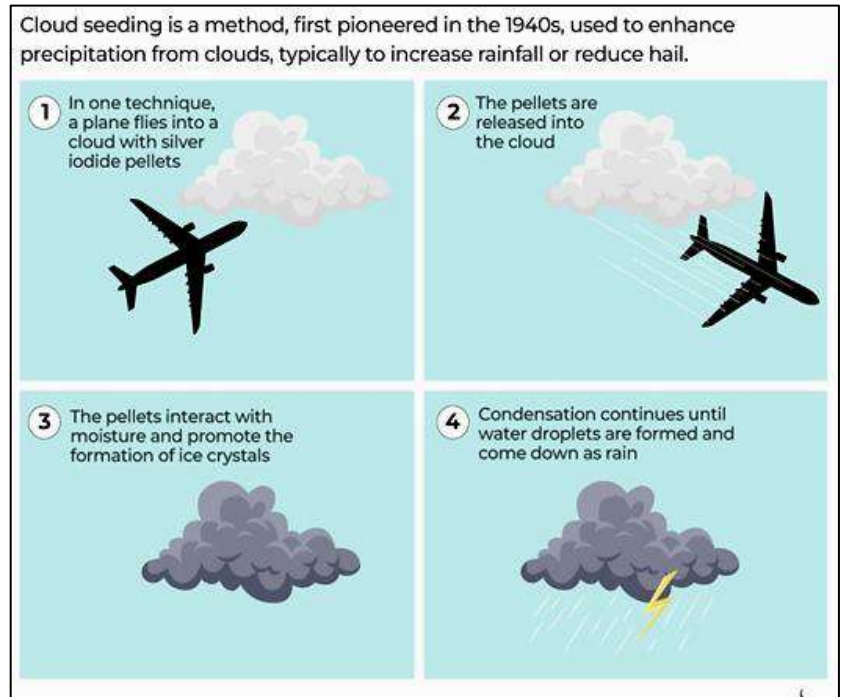
- **Strong low pressure system**-A low-pressure system in the upper atmosphere, combined with low pressure at the surface, acted like a pressure "squeeze" on the air.
- **Heavy thunderstorm**-This intensified squeeze, along with the contrast between warmer ground-level temperatures and colder temperatures higher up, created the conditions for the powerful thunderstorm.
- **Climate change**- Rising global temperatures, driven by human-led climate change, are leading to more extreme weather events worldwide, including intense rainfall.



- **Mesoscale convective system-** It is a series of medium-sized thunderstorms caused by massive thunderclouds, formed as heat draws moisture up into the atmosphere which can create large amounts of rain.
- **Rapid urbanisation-** In a recent study, Sharjah the capital of the third-largest emirate in the U.A.E., found that the city's rapid growth over the past half century had made it vulnerable to flooding at far lower levels of rain than before.
- **Cloud seeding-** There were speculations about cloud seeding contributing to the rainfall, however the metrology department clarified that no cloud-seeding operations were dispatched before or during the turbulent weather episode.

**What is cloud seeding?**

- **Cloud seeding-** It is a weather modification technique that improves a cloud's ability to produce rain or snow, it can be done from ground based generators or aircraft.
- **Origin-** It was started in 1946 in USA by using silver iodide and dry ice (solid carbon dioxide) to improve the creation of ice crystals in clouds.
- **UAE approach-** The country experiences less than 100 mm of annual rainfall, which is significantly low, this scarcity is exacerbated by high evaporation rates and a low groundwater recharge rate hence UAE adopts cloud seeding.
- **Seeding agents-** Salts like silver iodide, potassium iodide, sodium chloride, or dry ice (solid carbon dioxide), they are released into the targeted clouds. These seeding particles facilitate the formation of larger water droplets thereby augmenting rainfall.
- **Working mechanism** – A tiny ice nuclei is introduced into certain types of subfreezing clouds, these nuclei provides a base for snowflakes to form which grow and fall from the clouds back to the surface of the Earth.
- **Hygroscopic cloud seeding** – It disperses **salt particles** to speeds up droplet coalescence in liquid clouds to produce of large droplets to start precipitation.
- **Glaciogenic cloud seeding** – It disperses **ice nuclei** to trigger ice production in super cooled clouds, leading to precipitation.



*Cloud seeding a technique used to enhance precipitation by dispersing substances into the air has been part of the UAE's efforts to combat water scarcity since*

Applications	Challenges
<ul style="list-style-type: none"> <li>• It can create more winter snowfall and provide relief to drought stricken areas and support agriculture.</li> <li>• It enhances the natural water supply to communities.</li> <li>• It lessens hailstorms by reordering water vapour in clouds to breakdown large hailstones</li> <li>• It is used to tackle air pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• The chemicals used in seeding can cause potential side effects to living organisms.</li> <li>• It can change climatic patterns of the earth.</li> <li>• It involves huge costs and logistics preparations.</li> <li>• There is no way to ensure the exact area or duration of rainfall.</li> </ul>

- **Early stage targeting-** Cloud seeding is most effective when clouds are in their developmental stages, but in Dubai the cloud has already developed into severe thunderstorms hence it's not a reason for recent Dubai flood.

**What are the consequences of heavy Dubai flood?**

- **Heavy rainfall-** Al Ain, a city in UAE bordering Oman recorded 10 inches of rainfall, the largest ever in a 24-hour period since records started in 1949.

- **Disrupt daily life-** Heavy downpours have caused flooded homes, power outages, and emergency responses, Dubai Airport, the world's second busiest, was brought to a standstill following the rainfall.
- **Infrastructure damages-** The roads were collapsed, residential communities were hit by heavy flooding and many householders reported leaks from roofs, doors and windows.

### Cloud seeding in India

- **CPCB-** Central Pollution Control Board has mulled the use of cloud seeding to tackle **Delhi's air pollution.**
- **CAIPEEX phase-4-** Cloud Aerosol Interaction and Precipitation Enhancement Experiment was a scientific investigation conducted in Solapur city by IITM to investigate the efficacy of hygroscopic seeding in deep convective clouds and to develop a cloud seeding protocol.
- **Varshadhare project-** It is a cloud seeding project in **Karnataka government** to enhance the amount of precipitation from the clouds to generate more rain.

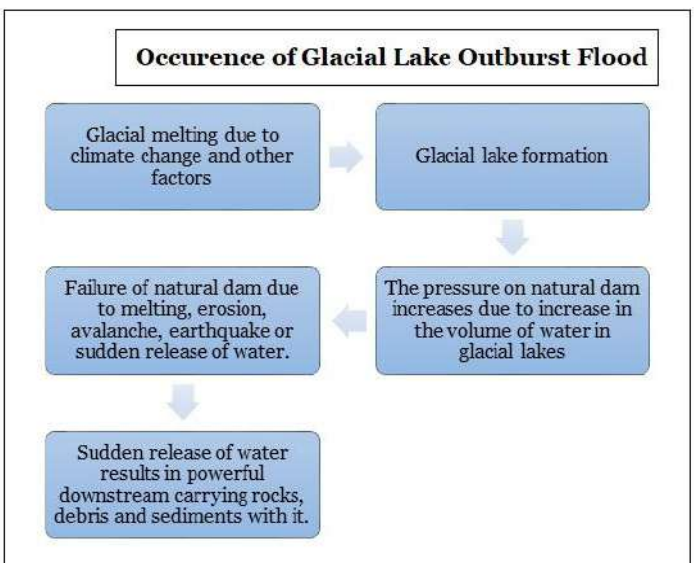
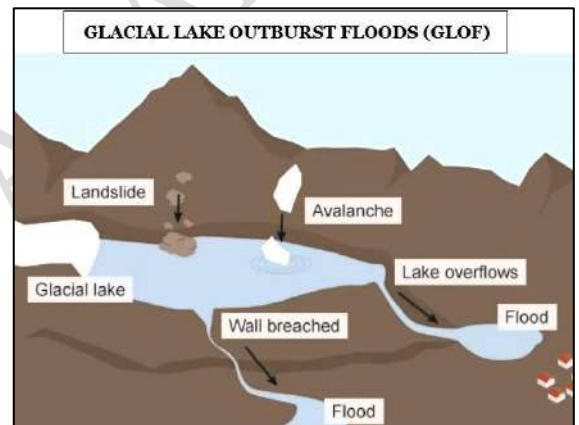
## 2.2 Glacial Lake Outburst Floods

### Why in news?

Recently Birendra glacial lake in Nepal collapsed due to avalanche.

### What is the glacial lake outburst flood?

- **Glacial lakes-** They are large bodies of water that sit in front of, on top of, or beneath a melting glacier.
- **Glacial Lake Outburst Floods (GLOFs)-** They are sudden and often catastrophic events that occur when water contained within or underneath a glacier or a moraine-dammed glacial lake is released rapidly.
- **Causes-** These floods typically result from the failure of natural dams made of ice, moraine (a mixture of rock, soil, and other debris), or both.
- **Ice and debris avalanches-** Avalanches of ice, rock and debris can impact glacial lakes, causing the release of large volume of water, avalanches occur due to various factors such as seismic activity, steep slopes or destabilization of ice and rock masses.
- **Ice dammed lakes-** Some glacial lakes are dammed by ice instead of moraine, when the ice dam melts or collapse, it can release large volumes of water downstream triggering GLOF.
- **Earthquake-** Seismic activity, including earthquakes can destabilize glacial lakes and their surrounding terrain, leading to failure of natural dams and release of water.
- **Volcanic eruption-** It can trigger GLOFs by melting ice, causing landslides or generating lahars (volcanic mudflows) that can impact glacial lakes.
- **Anthropogenic activities-** Activities such as mining, construction, and deforestation can destabilize the landscape, increase erosion, and contribute to the risk of GLOFs.
- **Vulnerable-** GLOFs pose a significant risks to communities living downstream of glacial lakes, especially in mountainous regions like Himalayas, Andes and Alps, where such lakes are common.



### Why Himalayas are more prone to Glacial Lake Outburst Floods?

- **High glacial activity-** The Himalayas are called as **Third Pole** it harbours world's largest glaciers after Arctic and Antarctic ice sheets.

- **Glacial melting**- As temperatures rise due to climate change, these glaciers are melting at an accelerated rate, leading to the formation of numerous glacial lakes which increases the risk of GLOFs.
- **Glacial lake formation**- Glacial lakes in the Himalayas are often dammed by unstable moraines, ice, or bedrock, these natural dams are susceptible to erosion, melting, and other forms of degradation, increasing the likelihood of failure and the release of floodwaters downstream.
- **Steep terrain**- The Himalayan region is characterized by rugged, steep terrain, which can contribute to the destabilization of glacial lakes and their surrounding moraines.
- **Unstable movements**-Avalanches, landslides, and rockfalls are common in this environment, posing risks to the stability of natural dams and increasing the likelihood of GLOFs.
- **Seismic activity**- The Himalayas are seismically active, with frequent earthquakes and tectonic activity, they can trigger landslides, avalanches, and the destabilization of glacial lakes, leading to GLOFs.
- **Monsoon climate**- The Himalayan region experiences heavy monsoon rains during the summer months, which can increase the volume of water in glacial lakes and contribute to the weakening of natural dams.
- **Population density**- The Himalayan region is densely populated, with communities living in valleys downstream of glacial lakes. This increases the potential impact of GLOFs on human lives, infrastructure, and livelihoods.

*ISRO said that 130 of the 676 lakes are situated in India, in the Indus (65), Ganga (7), and Brahmaputra (58) river basins have expanded as glaciers are retreating at an ever faster rate due to global warming.*

Instances of GLOFs in Himalayas	Location
Uttarkhand flash flood (2013), <a href="#">South Lhonak lake GLOF (2023)</a>	India
Lugge Tso GLOF (2015)	Tibet, China
Birendra Lake GLOF (2024), Imja Lake GLOF (2016),	Nepal

### Steps taken by India to prevent GLOFs

- **Sendai Framework (2015-2030)** – It is a global blueprint for disaster risk reduction and prevention.
- **Coalition for Disaster Resilient Infrastructure** - CDRI is an international climate initiative by India in 2019 to promote resilient climate-proof critical infrastructure in member countries.
- **National Disaster Management Authority (NDMA)** - NDMA, headed by the Prime Minister of India, is the apex body for Disaster Management in India.
- **Institutional mechanism**- Central Water Commission (CWC)/ National Remote Sensing Agency (NRSA)/ State governments also check for landslides and blockages in rivers with the help of satellite imageries.
- **Aapda Mitra** – Launched in 2016, it is a central sector scheme implemented by NDMA to train community volunteers in disaster response in selected 30 most flood prone districts of 25 states including Sikkim.
- **Doppler radars** - The India Meteorological Department (IMD) has been using Doppler radars, a flash floods forecasting and warning systems.

### What can be done to mitigate GLOFs?

- **Artificial drainage**- Lowering the water level of glacial lakes can reduce the risk of outburst floods.
- **Study of Ghepan Gath lake, Himachal Pradesh**- It showed that lowering lake levels by 10 to 30 meters had a significant impact reduction on Sissu town, the risks were not completely eliminated but still can minimize potential consequences of GLOF.
- **High Density Polyethylene (HDPE) pipes**- In 2016, Sikkim used HDPE pipes to reduce water levels in South Lhonak Lake.
- **Risk assessment**- Researchers need to continuously monitor the lakes for signs of instability and potential outburst events, this includes using satellite imagery and developing models to predict GLOF risk.
- **Early warning systems**- Establishing effective early warning systems is critical for minimizing damage and casualties, these systems should utilize real-time monitoring data to provide timely alerts to downstream communities in the event of a GLOF threat.

*Satellite remote sensing technology by ISRO proves to be an excellent tool for monitoring due its wide coverage and revisit capability.*

- **International cooperation-** The GLOFs in the Himalayas can affect multiple countries, international cooperation is essential which can foster collaborative efforts such as sharing data, resources and expertise to better understand and mitigate the risks posed by glacial lakes.
- **Research-** Continued research into glacial dynamics, climate change impacts, and GLOF mitigation strategies is necessary to develop innovative approaches that reduce GLOF risk.

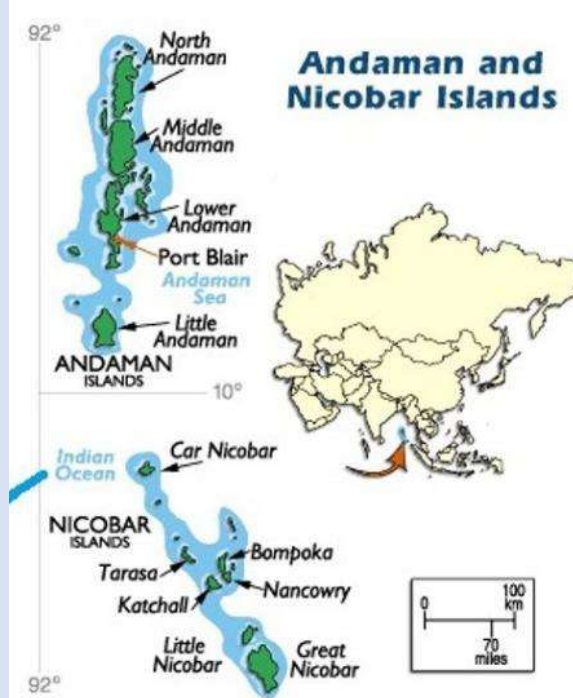
### 2.3 Strategic significance of Andaman and Nicobar Islands

#### Why in news?

The new thrust on developing strategic infrastructure, both civilian and military, on the Andaman and Nicobar Islands has been long awaited.

#### Andaman and Nicobar Islands

- **Location-** It consists of two groups of islands at the south eastern edge of the Bay of Bengal.
- **Strategic arc-** The islands form an arc stretching southward between Myanmar and the island of Sumatra, Indonesia. The arc constitutes the boundary between the Bay of Bengal to the west and the Andaman Sea to the east.
- **Territorial capital-** *Port Blair* (South Andaman Island).
- **British rule-** The Andamans were visited by the navy of the English East India Company in 1789 and in 1872 they were linked administratively to the British to the Nicobar Islands.
- **Post-Independence-** The two set of islands became a union territory of the Republic of India in 1956.
- **Tribes-**
  - **Andaman-** The Great Andamanese, the Onges, the Jarawa and the Sentineles,
  - **Nicobar-** The Nicobarese and the Shompen



#### What is the strategic importance of Andaman and Nicobar Islands?

- **Geopolitical location-** Situated at the mouth of the Malacca Strait, the Andaman and Nicobar Islands offer a strategic vantage point for monitoring and controlling maritime traffic passing through one of the world's busiest waterways.

Strategic location	Significance
Sabang in Indonesia	It is 90 nautical miles southeast of Indira Point (on Great Nicobar island)
Coco Island in Myanmar	It is barely 18 nautical miles from the northernmost tip of the Andamans.
Kra canal to be built by Thailand	The canal would connect the Gulf of Thailand with the Andaman Sea, its mouth would be about 350 nautical miles east of Port Blair.
Malacca strait	It connects the Indian Ocean to the Pacific, is less than a day's steaming from Port Blair.

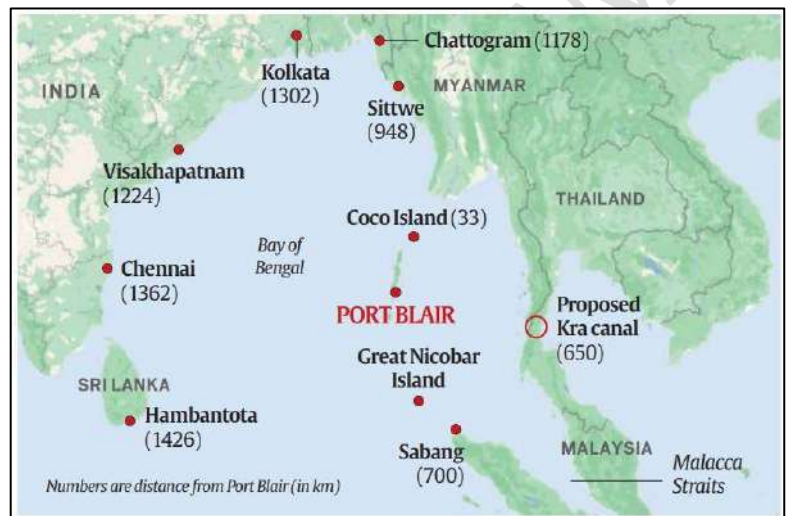
- **Strategic chokepoints-** The islands are positioned near several strategic chokepoints, including the Malacca, Sunda, Lombok, and Ombai-Wetar straits. Control over these chokepoints is essential for maritime security and trade flows in the region.

- **Significance of Maritime boundary-** The islands share maritime boundary with neighbouring countries like Myanmar, Thailand, Indonesia, and Bangladesh, giving India significant influence over maritime activities in these regions under UNCLOS.
- **Military importance-** The development of military infrastructure on the islands enhances India's ability to project power and deter potential threats from the eastern direction, particularly from China.
- **Economic potential-** The islands offer economic opportunities, including maritime trade, tourism, and fisheries. Developing infrastructure to support these sectors can contribute to islands' economic growth and reduce their dependence on mainland India for essential supplies.

*Andaman and Nicobar Command (ANC), established as a tri-services command in 2001, plays a crucial role in safeguarding India's maritime interests.*

### Why the pace of developing strategic infrastructure in the islands has have been slow?

- **Slow realisation-** The unprecedented expansion of China's navy has prompted the island's strategic criticality for India's security.
- **Infrastructure deficit-** The distance from the mainland and the inherent difficulties in developing infrastructure have been cited as reasons for delays in various projects.
- **Complex procedures-** Obtaining environmental clearances, even for small projects, has been a complex process.
- **Land acquisition-** Regulations related to forest conservation and the protection of native tribes have further complicated land acquisition issues.
- **Multi-dimensional project-** Developing the islands and their strategic infrastructure involves coordination across multiple ministries, departments, and agencies. This multi-dimensional effort presents significant challenges.
- **Political impact -** Seeking immediate political gains takes precedence over long term strategic vision.



### What should strategic infrastructure development in these islands focus on?

- **Surveillance-** Establishing robust surveillance systems to monitor the vast maritime area stretching 420 nautical miles from north to south is essential to deter potential threats.
- **Maritime infrastructure-** Construction of ports and fuel storages in both the northern and southern groups of the islands is crucial for the operational turnaround of ships without returning to Port Blair.
- **Military infrastructure-** Building military bases, airfields, and naval facilities to enhance defence capabilities and ensure a rapid response to security challenges.
- **Enhance connectivity-** Improving transportation infrastructure, including airports, ports, roads, and ferry services, to facilitate the movement of people and goods within the islands and with the mainland.
- **Economic development-** Promoting economic activities such as tourism, fisheries, and maritime trade through the development of ports, logistics facilities, and tourist amenities.
- **Sustainable development-** Balancing development with environmental conservation by obtaining necessary clearances and implementing eco-friendly practices.
- **Great Nicobar Project-** Accelerating the development of the Galathea Bay transshipment port on Great Nicobar Island is vital. Maritime services such as repair and logistics for both international and Indian shipping need to be established.
- **Incentivise habitation-** Consideration should be given to the planned habitation of uninhabited islands by providing incentives like free or subsidized land to encourage eco-friendly entrepreneurial activities.
- **International cooperation-** Leveraging international partnerships, such as the [QUAD](#) and the [Indo-Pacific Oceans Initiative](#) (IPOI), to support development efforts and enhance regional stability.

### 3. SOCIAL ISSUES

#### 3.1 Income and Wealth Inequality

##### Why in news?

According to the World Inequality Lab, the top 1% in India earned 22.6% of the national income in 2022-23, the highest share in the last 100 years.

##### What are the key highlights of the study?

Income inequality	Wealth inequality
<ul style="list-style-type: none"> <li>In 2022-23, 22.6% of India's national income went to the top 1%, 50% higher than China marking the highest level in the last 100 years.</li> <li>The top 0.1% of the population earned nearly 10% of the national income.</li> <li>India's income inequality ranks among the highest globally, surpassing even countries like South Africa, Brazil, and the U.S.</li> <li>The high income inequality of India contributes to widening wealth disparity.</li> </ul>	<ul style="list-style-type: none"> <li>The top 1% in India held 40.1% of the national wealth in 2022-23, the highest level since 1961.</li> <li>The share of wealth among the top 10% increased significantly, reaching 65% in 2022-23.</li> <li>The share of bottom 50% and middle 40% in wealth declined, indicating a widening wealth gap.</li> <li>India's wealth inequality, while not as extreme as Brazil and South Africa, increased significantly over the years.</li> </ul>

- Inequality trends-** Between 1960 and 1980, inequality in India was decreasing, which was attributed to the growth pattern and economic objectives of that era. However, the trend reversed with the economic liberalization that began in the 1980s and accelerated after the economic reforms of 1991.

- Wealth concentration-** The period 2014-15 to 2022-23 seen a pronounced rise in wealth concentration, often referred to as the 'Billionaire Raj', indicating that the wealthiest individuals have amassed a large portion of the nation's wealth.

- Historical comparison-** The report makes a comparison with the British Raj, indicating that the modern economic elite in India have created a more unequal society than what existed under colonial rule.

- Impact on society-** The report suggests that rising inequality has negative implications for both economic growth and poverty reduction efforts.

##### What are the challenges faced by India in achieving income and wealth equality?

- Moderate economic growth-** China has maintained a higher growth rate with moderate inequality, while India's growth has been moderate with extreme inequality.

- Dual challenge-** India faces the dual challenge of achieving high economic growth and reducing inequality, human development and poverty reduction are crucial for achieving the twin objective.

- Poor human development-** [Human Development Report](#) (HDR) 2023-2024 has ranked India 134 out of 193 countries, this shows that economic growth has not translated into growth in human development.

- Economic inequality-** HDR 2023-2024 reveals that India's human development score decreases by 31.1% when economic inequality is taken into account, this underscores the detrimental effect of inequality on the overall well-being and capabilities of the population.

#### China's economic growth

- Until 1975, India's average income (adjusted for inflation and purchasing power) was comparable to that of China and Vietnam.
- However, in the subsequent 25 years, China and Vietnam experienced income growth of 35-50% compared to India.
- Post-2000, China's income surged significantly, becoming 2.5 times that of India.
- China's growth has been broad based, benefiting a larger segment of its population.
- China has maintained a higher growth rate while keeping economic inequality in check.

*Despite being the fifth largest economy, India lags behind Sri Lanka, Bhutan, and Bangladesh in terms of human development.*

- **Regional disparity-**

<b>Advanced human development</b>	States with over 7% GSDP growth per year, like Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Gujarat, Punjab, and Delhi.
<b>Lag in human development</b>	States like Jharkhand, Chhattisgarh, Bihar, Madhya Pradesh, Odisha, Uttar Pradesh, and Rajasthan, they have registered less than 5% growth post-liberalization

- **Policy limitations-** Existing policies, such as the [Pradhan Mantri Garib Kalyan Anna Yojana](#) are insufficient to address the scale of economic inequality.
  - *Pradhan Mantri Garib Kalyan Anna Yojana launched in 2020 aims to provide free food grains to the poor and needy through the Public Distribution System.*

#### What lies ahead?

- There is a need for a balanced approach to economic policy, where human development is a precursor to and a component of economic growth, leading to more equitable outcomes.
- Human development is essential for high economic growth and reducing inequality.
- Sustainable and inclusive growth requires comprehensive policy interventions that focus on enhancing human capabilities, reducing poverty, and creating meaningful employment opportunities.
- Addressing inequality is not just a matter of economic policy but also crucial for maintaining social cohesion and political stability.

## 4. INDIAN POLITY

### 4.1 Fifth Schedule and Sixth Schedule

#### Why in news?

The candidates of all parties in the Assam's tribal majority Diphu Lok Sabha constituency have promised the implementation of Article 244(A) of the Constitution.

Diphu
<ul style="list-style-type: none"> <li>• It is the headquarters of Karbi Anglong district in Assam.</li> <li>• <b>Diphu-</b> The world came from Dimasa language, meaning White Water (Di for Water, and Phu for White).</li> <li>• <b>Major tribes-</b> Karbi (3<sup>rd</sup> largest tribe in the State), Dimasa Kachari, Garo Kachari, Boro Kachari, Rengma Naga.</li> <li>• <b>Sixth Schedule-</b> The three tribal-majority hill districts of Assam are administered under the provisions of the Sixth Schedule of the Constitution, which describes the "Provisions as to the Administration of Tribal Areas in the States of Assam, Meghalaya, Tripura and Mizoram".</li> <li>• <b>Autonomous council-</b> The region is managed by autonomous council namely                     <ul style="list-style-type: none"> <li>○ Karbi Anglong Autonomous Council (KAAC) and the</li> <li>○ North Cachar Hills Autonomous Council</li> </ul> </li> <li>• <b>Diphu pass-</b> A mountain pass around the tri-point borders of <a href="#">India, China, and Myanmar</a> in Arunachal Pradesh</li> </ul>

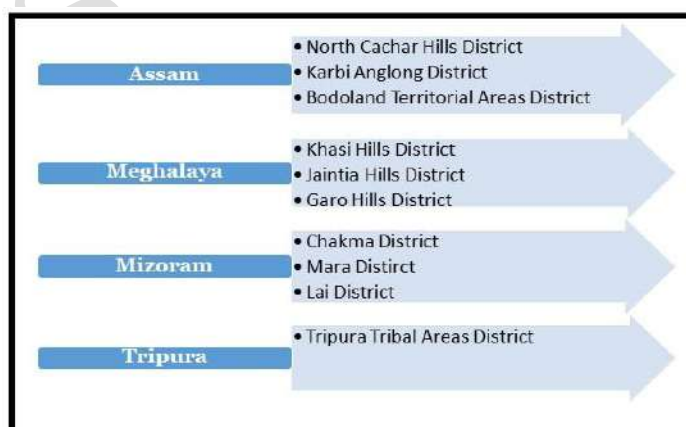
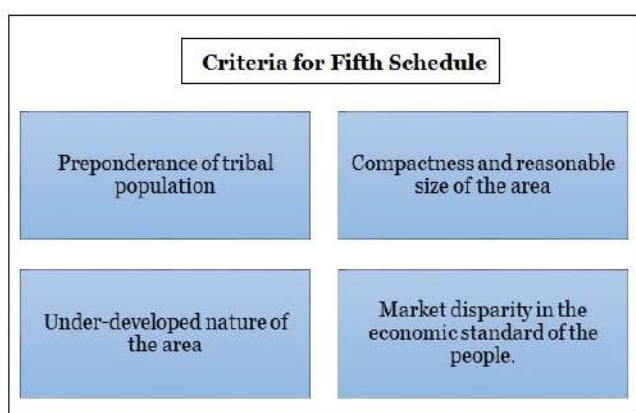
#### What is Article 244 of the Constitution?

- It is in Part X of the Constitution that deals with the application of the provisions of the Fifth Schedule and Sixth Schedule.

Key aspects	Fifth Schedule	Sixth Schedule
<b>About</b>	It shall apply to the administration and control of the Scheduled Areas and Scheduled Tribes in any State other than Assam, Meghalaya, Tripura and Mizoram	It shall apply to the administration of the tribal areas in Assam Meghalaya, Tripura and Mizoram.

<b>Purpose</b>	<ul style="list-style-type: none"> <li>To protect the interests and rights of the tribals in their land, habitat and economy</li> <li>To preserve the communities customs and tradition and to ensure a faster socio-economic development in the "Scheduled Areas".</li> </ul>	Considering the distinct life and outlook of the tribals in the North-East (erstwhile State of Assam), the Constituent Assembly recognised the necessity of a separate administrative structure for the tribals in the region
<b>Application</b>	Scheduled areas are predominantly inhabited by tribes specified as "Scheduled Tribes" and located in Andhra Pradesh, Telangana, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Jharkhand, Maharashtra, Orissa and Rajasthan	Currently there are 10 Autonomous District Councils in North East
<b>Power</b>	The President is the authority to declare any area as a Scheduled Area or renounce a Scheduled Area or part of it as a non-Scheduled Area in consultation with the Governor of the concerned State	Governor of the State is empowered to determine the area or areas as administrative units of the Autonomous Districts and Autonomous Regions.
<b>Special mechanism</b>	Tribal Advisory Council is constituted by Governor of a State having Scheduled Areas to deal with the welfare of Scheduled tribes in states.	Autonomous District Councils, and Regional Councils endowed with certain legislative, executive, judicial and financial powers

- **Criteria for Fifth Schedule-** It is recommended by the First Scheduled Areas and Scheduled Tribes Commission also known as ***Dhebar Commission***.
- **Autonomous District Councils (ADCs)-** The Governor has the power under the Sixth Schedule to create a new Autonomous District/Region or alter the territorial jurisdiction or the name of any Autonomous District or Autonomous Regions.



<b>Autonomous districts Pre Independence</b>	<b>Autonomous districts Post-Independence</b>
<ul style="list-style-type: none"> <li>• <b>Colonial rule-</b> When the British took over the-then Assam, their imposition of formal laws on the land was resisted ferociously by tribal populations living in the hills, who had their own customary laws.</li> <li>• <b>Government of India Act 1935-</b> To avoid confrontation the British divided the hill regions of Assam into "excluded" and "partially excluded" areas as they were only interested in economic exploitation of the region.</li> <li>• <b>Aim-</b> To allow tribal populations to govern themselves.</li> <li>• <b>Limitations-</b> In these areas, federal or provincial laws would not apply until the Governor felt they were needed for peace and development.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Bardoloi committee-</b> It recommended to adopt GoI Act 1935 with improvements into the Sixth Schedule of the Constitution.</li> <li>• <b>ADCs-</b> It had recommended creation of autonomous district councils (ADCs) in the 6 hill districts of Assam.</li> <li>• <b>Regional council-</b> The Committee recommended creation of regional councils under ADCs to cater to the needs of minor tribes in the jurisdiction of those ADCs.</li> <li>• <b>Sixth Schedule-</b> It contains provisions related to the administration of tribal areas in the states of Assam, Meghalaya, Tripura and Mizoram.</li> </ul>

## What is Article 244(1) of the Constitution?

- **Origin-** It is introduced by **22<sup>nd</sup> Constitution Amendment Act, 1969** that provides a framework for creation of an autonomous state within Assam.
- **Provision-** It deals with the formation of an autonomous state that comprises certain tribal areas of Assam and having a council of ministers.
- **Autonomous state-** It could include all or other part of the tribal areas specified such as Karbi Anglong.
- **Function-** The autonomous state would be endowed with its own legislature or Council of Ministers or both offering a degree of self-governance beyond what is available under the Sixth Schedule.
- **Need-** To enhance the autonomy of these region by potentially allowing for a more comprehensive governance structure that could address these limitations under Sixth Schedule.

## 4.2 Rules for Star Campaigners

### Why in news?

Sunita Kejriwal, wife of Delhi Chief Minister Arvind Kejriwal, was appointed as a 'star campaigner' by the Aam Aadmi Party (AAP) for its campaign in Gujarat.

### What are the legal provisions of star campaigners?

- **Representation of People's Act, 1951-** Section 77 of the Act provides for law relating to expenditure incurred by 'leaders of a political party'. These 'leaders of a political party' are popularly known as 'star campaigners'.
- **About-** Star campaigners are prominent individuals appointed by political parties to attract more votes during elections. They are usually top leaders of a party but can also include other celebrities.
- **Guidelines-** The Election Commission has issued guidelines the Model Code of Conduct (MCC) regulating poll campaign by star campaigners.
- **Eligibility-** These campaigners must be members of the political party that appoints them.
- **Communication-** The names of star campaigners must be communicated to the Election Commission (EC) and the Chief Electoral Officer (CEO) of the relevant states within seven days from the date of election notification.
- **Multi-phase elections-** In multi-phase elections, a political party can submit separate lists of star campaigners for different phases. However, major parties often provide a single list applicable to the entire state.
- **Role of Election Commission-** The Supreme Court has stated that the Election Commission does not have the authority to decide who can be a star campaigner.

*There's no specific law defining who can be a star campaigner.*

Political parties	Star campaigners
Recognized parties	Up to 40
Unrecognized parties	Up to 20

### What are the financial regulations for star campaigner?

- **Travel expenses-** Expenditure incurred by star campaigners on travel for party campaigning is not counted as part of a candidate's election expenditure.
- **Election expenditure limits-**
  - Larger States- Rs 95 lakh per constituency
  - Smaller States- Rs 75 lakh per constituency.
- **General campaigning-** Star campaigners' expenses remain separate from candidates' expenses only if they limit themselves to general party campaigning.
- **Rally/meeting participation-** If a star campaigner explicitly seeks votes for a candidate or shares the stage with them, the rally/meeting expense is added to the candidate's expenditure.
- **Multiple candidates-** When multiple candidates share the stage with a star campaigner, the rally's expenditure is divided equally among them.
- **Candidate promotion-** If a candidate's posters or photographs are displayed at a star campaigner's rally in their constituency, the entire expense of the rally is allocated to the candidate's election expenses.

*Representation of the People Act (RP Act) outlines the financial regulations for election campaigning in India.*

- **Boarding/ Lodging expenses-** Any boarding or lodging expenses incurred by a star campaigner for campaigning are included in the candidate's expenditure account, regardless of who pays for it.
- **Joint travel-** If a candidate travels with a star campaigner, 50% of the star campaigner's travel expenditure is apportioned to the candidate's expenditure.
- **Special provision-** MCC guidelines says that if Prime Minister or Former Prime Minister as star campaigner then the expenditure incurred on security including on the bullet-proof vehicles will be borne by the government and will not be added to the election expenses of the party or the individual candidate.
  - If another campaigner travels with the prime minister or former minister, the individual candidate must bear 50% of the expenditure incurred on security arrangements.
- **Fair election-** These rules ensure that while star campaigners can be effective vote-fetchers, their activities are regulated to maintain fair election expenditure practices.

#### What are the issues with star campaigning?

- **Expenditure assessment-** Assessing expenditure for star campaigner's rallies often underestimate actual costs it is due to the rate card used by the Election Commission.
- **Inefficiency-** The expenditure assessment challenges is due to EC's rate card as it does not reflect current market rates for various items which results in lower apportionment of expenditure to contesting candidates.
- **Advisory-** Election Commission (EC) issued an advisory to all political parties, emphasizing decorum and issue-based debates during campaigning. Star campaigners were put on notice regarding violations.
- **Inappropriate language-** Star campaigners from various parties have used inappropriate and abusive language against leaders of opposing parties. Appeals to caste or communal feelings and unsubstantiated allegations have been observed.
- **Madhya Pradesh Assembly By-Election 2020-** The Supreme Court stayed the EC's decision to revoke Kamal Nath's star campaigner status for derogatory remarks against a woman candidate.

#### What lies ahead?

- RP Act, 1951 could be amended to authorize the EC to revoke the 'star campaigner' status of a leader in case of serious violations of the Model Code of Conduct. This action would prevent party candidates from receiving expenditure relief for their campaigns.
- Such an amendment would encourage a sense of responsibility among star campaigners, ensuring that campaigns maintain necessary decorum and restraint.

### 4.3 States' Jurisdiction over Liquors

#### Why in news?

The Supreme Court's 9 judge bench is considering if the States have the power to regulate and levy excise duty tax on industrial alcohol.

#### Excise Duty

- It refers to the taxes levied on the manufacture of goods within the country, as opposed to custom duty that is levied on goods coming from outside the country.
- **Indirect tax-** It is generally collected by a retailer or an intermediary from its consumers and then paid to the government
- **Legal framework-** The excise duty is governed by the two acts-
  - Central Excise Act, 1944
  - Central Excise Tariff Act, 1985
- **Collection-** The Central Board of Excise and Customs (CBEC) is responsible for collecting excise duty.
- **Payment of excise duty-** Electronic Accounting System in Excise and Service Tax (EASIEST), the payment gateway of CBEC, through this the excise duty can be paid.
- With the introduction of GST, several indirect taxes have been subsumed, including excise tax.
- Nonetheless, it is still applicable to a few items like petroleum, liquor, etc.,

### What is the current case before Supreme Court?

- The Supreme Court is considering whether state governments have the power to regulate and control the sale, distribution, pricing and other factors relating to ‘industrial’ alcohol.
  - Industrial alcohol serves as a raw material for various products and is not intended for human consumption.

Centre’s Jurisdiction over liquor	State’s Jurisdiction over liquor
<ul style="list-style-type: none"> <li>• <b>Union list (Entry 52) and Concurrent List (Entry 33)</b>- It mentions industries whose control is deemed expedient in public interest by Parliament.</li> <li>• Industrial alcohol is listed in the <i>Industries (Development and Regulation) Act, 1951 (IDRA)</i>.</li> <li>• Due to prevailing Central law in this subject, it will exist over the State law.</li> </ul>	<ul style="list-style-type: none"> <li>• State list (Entry 8)- It grants States authority to legislate on matters related to the production, manufacture, possession, transport, purchase, and sale of intoxicating liquors.</li> <li>• The subjects mentioned in the Concurrent List (Entry 33) can be legislated by both States and Centre.</li> <li>• But if a central law exists, State laws cannot contradict it.</li> </ul>

- **Ch Tika Ramji vs State of UP, 1956**- The Court upheld a legislation enacted in UP to regulate the supply and purchase of sugarcane.
- It was challenged on the grounds that under Section 18-G of the IDRA, the Centre had exclusive jurisdiction over regulation of the sugar industry.
- The court held that Section 18-G is not meant to “cover the entire field” and the state still had power to legislate on matters relating to the sugar industry under Entry 33 of the Concurrent List.
- **Synthetics & Chemicals Ltd v. State of Uttar Pradesh, 1989**- The Court held that States’ powers, as per Entry 8 of the State List, were limited to regulating “intoxicating liquors” which are different from industrial alcohol.
- The Court said that only the Centre can impose levies or taxes on industrial alcohol, which is meant for human consumption.
- **Uttar Pradesh Excise Act, 1910**- In 1999 the State has introduced a 15% fee for sales made to license holders, this fee was applied to alcohol used directly or a solvent for vehicles even if it appeared in the final product to some extent.
- It was challenged as the Centre had exclusive jurisdiction over industrial alcohol under *Section 18-G of IDRA, 1951*.
- The Allahabad High Court declared the State’s notification as invalid, the court held that the state legislature’s authority extended only to the regulation of drinkable alcohol not denatured spirits or industrial alcohol.
- It was appealed in Supreme Court for further examination.

### What is the stand of Uttar Pradesh?

- The phrase “intoxicating liquors” in Entry 8 of the State List encompasses all liquids containing alcohol, the terms like liquor, spirit and intoxicant were already used in excise laws before the Constitution came into force.
- The Centre’s power under the Union list doesn’t extent to finished products such as industrial alcohol, instead it falls under Concurrent list.
- To exercise exclusive control over the regulation of industrial alcohol, the Centre would need to issue an order under Section 18-G of IDRA, 1951.
- **ITC vs Agricultural Produce Market Committee, 2002**- The Supreme Court emphasized that States not mere appendages of the Centre and that their reserved powers should not be undermined.

## 4.4 Unregulated Soil Extraction for Linear Projects

### Why in news?

Recently, the Supreme Court has set aside Environment ministry notification that exempted extraction of ordinary earth for linear projects such as road and railway extraction.

### What was the 2020 exemption?

- In 2006, the Environment Ministry had issued notification under The Environment (Protection) Act, 1986, on activities that would require prior Environmental Clearance (EC).
- In 2016, another notification exempted certain categories of projects from EC.
- In 2020 the ministry added “Extraction or sourcing or borrowing of ordinary earth for the linear projects such as roads, pipelines etc., to the list of exempted activities.
- The general purpose of the notification was to conform to the amendments made to the Mines and Minerals (Development to Regulation) Act, 1957 allowing lessees to continue mining for 2 years with statutory clearances and licences issued to their predecessors.
- The exemption was challenged in National Green Tribunal.

### What are the grounds of challenge in NGT?

- **Violation of Article 14-** The exemption was deemed arbitrary and violative of Article 14 of Constitution of India, as it allowed indiscriminate extraction of earth without defining clear guidelines or safeguards.
- **Arbitrary-** It was argued that the exemption favoured private miner and contractors, rather than serving public interest.
- **Bypassing legal procedures-** The petitioner contended that the Ministry wrongly exercised its powers under the pretext of public interest during the COVID- 19 lockdown to serve the interests of private entities.
- **Lack of environmental safeguards-** The exemption failed to incorporate necessary safeguards and standards for environmental protection, the absence of defined limits on the quantity of extraction or specification of areas for extraction posted risks to environmental conservation.
- **Absence of justification-** The Ministry provided no justification for waiving the requirement of public notice or for issuing a blanket exemption without considering environmental concerns or applying proper scrutiny.
- **Deepak Kumar vs State of Haryana (2012)-** The exemption violated the requirement of prior EC in the leases as laid by the top court in this case.
- **NGT ruling-** It held that the Ministry “should strike a balance and instead of being a blanket exemption, it needs to be hedged by appropriate safeguards such as the process of excavation and quantum”.
- **Review the exemption-** NGT asked the Ministry to review it within three months, due to the Ministry's delay in reviewing the exemption, the issue escalated to the Supreme Court.

*Article 14 guarantees equality before law and equal protection of the law to all persons.*

### Judicial scrutiny of exemptions under Environment Protection Act, 1986

- The NGT nullified a 2016 notification that exempted certain building and construction activities from needing EC, citing no evidence of environmental quality improvement<sup>1</sup>.
- The NGT invalidated two Office Memorandums 2012 and 2013 that allowed for retrospective EC under the 2006 notification, emphasizing that the Environment Protection Act (EP Act) requires prior approval.
- A Ministry notification aimed to extend an amnesty period ( It is a fixed period of time during which people are not punished for committing a particular crime) in 2017 for projects categorized as violations, granting them ex-post facto approval, this was halted by the Supreme Court.
- The Kerala High Court quashed a 2014 notification that exempted educational institutions and industrial sheds from the EC requirement if they had built-up areas over 20,000 square metre.

### What is the stand of Supreme Court?

- **Lack of guidance-** The exemption was deemed arbitrary and against Article 14 of the constitution because it did not clearly define ‘linear projects’ or the amount and area of earth extraction allowed.
- **Absence of justification-** The Ministry did not provide a valid reason for removing the requirement of public notice, which is considered essential for such exemptions.
- **Inadequate details-** A subsequent notification was made by the ministry in 2023 which also failed to clarify the definition of linear projects, the responsible authority for environmental safeguards or set limits on the amount of earth that could be extracted.

- **Rushed exemption-** The Court highlighted the flaws in 2020 exemption, it expressed confusion over the government's rush to issue the exemption, since it coincided with a nationwide lockdown that halted construction.

### National Green Tribunal (NGT)

- **Statutory body-** It is established under *National Green Tribunal Act, 2010*.
- **Ministry-** Ministry of Law and Justice
- **About-** It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.
- Its dedicated jurisdiction in environmental matters shall provide speedy environmental justice.
- **Mandate-** To endeavour for disposal of applications or appeals finally *within 6 months* of filing of the same.
- **Governing principles-** The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by *principles of natural justice*.
- NGT applies the principles of *sustainable development*, *precautionary principle*, and *polluter pays principle*.
- **New Delhi-** It is the Principal Place of Sitting of the Tribunal.
- India is the *3<sup>rd</sup> country in the world*, after Australia and New Zealand, to set up a statutory body for environmental protection.

## 4.5 Right Against Climate Change

### Why in news?

Recently the Supreme Court has ruled that people have a "right to be free from the adverse effects of climate change", which should be recognised by Article 14 and Article 21 of the Constitution.

### What was the case before Supreme Court?

- A writ petition was filed for the protection of critically endangered *Great Indian Bustard (GIB) and Lesser Florican*.
- The plea included measures like bird diverters, halting new projects, and dismantling harmful structures in critical habitats and also referred to India's commitment to transition to non-fossil fuel energy sources in *Paris climate treaty*.
- In 2021, the Supreme Court had restricted the setup of overhead transmission lines and proposed conversion of existing overhead low and high voltage lines into underground power lines across a vast area of GIB habitats in Rajasthan and Gujarat.
- The government has sought to modify the order due to its impact on India's power sector and the challenges of undergrounding power lines.
- Recently the court revised its previous order to allow for the assessment of underground power lines in specific areas, considering various factors like population density and infrastructure requirements.

*The court noted that environmental aspects of the Directive Principles should be interpreted in conjunction with the right to life and personal liberty under Article 21.*

### What are the key highlights of recent Supreme Court ruling?

- **Fundamental right-** The court connects the fight against climate change to the constitutional right to life and equality asserting that these cannot be fully realized without a clean and stable environment.
- **Right to health-** The judgement recognised that the right to health is compromised by environmental issues like air pollution and climate change, disproportionately affecting underserved communities.
- **Human rights-** The court emphasized the interplay between climate change and various human rights, including health, indigenous rights, gender equality, and development.
- **Huge impact-** Environmental rights violations have wide-reaching impacts across multiple rights domains, including life, health, water, housing, and procedural rights.

*A healthy environment, free from the adverse effects of climate change, is deemed a fundamental human right.*

- **Gendered impact of energy access-** The judgment noted that unequal energy access affects women and girls more due to traditional gender roles.
- **Role of solar power-** The court highlighted solar power as a key solution in combating the adverse effects of climate change.

### Need of solar energy

- **Growth of energy demand-** India's expected contribution to global energy demand growth is substantial, and solar power can provide energy security and environmental benefits.
- **Air pollution-** The need for cleaner energy sources is underscored by severe air pollution, and solar power offers a pollution free alternative.
- **Water conservation-** With falling groundwater levels and rainfall, solar power presents an advantage as it does not deplete water resources.
- Thus the court has highlighted solar power as a critical solution for India's energy future.
- **Environmental preservation-** Articles 48A and 51A(g) of the Indian Constitution emphasizes the State's and every citizen's responsibility towards environmental conservation, although these provisions are not enforceable in a court of law, they signify the constitutional recognition of the importance of protecting the natural world.
- **Expert committee-** The court proposed to constitute 9 member expert committee to examine the problem faced by the bird species whose natural habitat and flight routes collide with power transmission lines in Gujarat and Rajasthan.
- **Renewable energy goals-** The court recognized India's goals to achieve 175 GW of renewable energy capacity by 2022 and 450 GW by 2030, emphasizing the importance of clean energy for environmental preservation.
- **Inclusive growth-** The promotion of renewable energy sources plays a crucial role in promoting social equity by ensuring access to clean and affordable energy for all segments of society, especially in rural and underserved areas.
- **Energy security-** It is essential to harness power from sources of renewable energy in Rajasthan and Gujarat to meet the rising power demand in the country in an expeditious and sustainable manner.
- **Technical complexities-** Underground power transmission cables are only available in 400 KV with lengths of 250 meters, necessitating more joints, which could lead to leaks.
- **Transmission loss-** There is a significant transmission loss in these cables, about five times higher than overhead cables, as they are less efficient in transmitting AC power.
- **Land acquisition-** The *Electricity Act* does not account for land acquisition for laying underground cables, unlike overhead transmission lines, which only require the right of way.
- **Environmental concerns-** The bench also noted potential environmental issues, such as the impact on vulnerable species and the risk of forest fires.

### Supreme Court's interpretation of Article 21

- Article 21 has been interpreted expansively by the court to encompass various rights that are essential for dignified human existence.
- The court emphasized that the right to life is more than mere survival or animal existence, it includes the right to live with human dignity.
- In 1987, *right to a clean environment* was recognised as part of life under Article 21 was a significant step in recognizing environmental preservation as integral to human well-being.
- Over the years, the Supreme Court has included a range of rights under Article 21, such as right to education, shelter, clean air, livelihood and medical care which are seen as essential components of a dignified life.

### What lies ahead?

- The Supreme Court affirms that Indian citizens have a right against the adverse effects of climate change, despite the lack of specific legislation on the issue.
- The Supreme Court has, from time to time, expanded the fundamental rights chapter to include various facets of a dignified existence. However, this is the first time that it has included the "right against the adverse effects of climate change"

## Great Indian Bustard

- **Scientific name** – *Ardeotis nigric*
- It is the **State bird of Rajasthan**.
- **Habitat** – Dry grasslands and scrublands on the Indian subcontinent.
- Its largest populations are found in **Rajasthan** in the arid grasslands of Thar Desert National Park and Pokhran Field Firing Range.
- They are **omnivores** and considered as an indicator of the health of grassland ecosystem.
- **Reproduction** – They are a slow-reproducing species and lay few eggs and have almost a year-long parental care of chicks.
- **Threat** – Habitat loss, Hunting and poaching.
- **Conservation Efforts** – In 2012, Project Bustard, a national conservation program was launched to protect the GIB along with Bengal florican (Critically endangered) and lesser florican (Critically endangered).
- GIB has also been identified as one of the species for the recovery programme under the Integrated Development of Wildlife Habitats of Ministry of Environment, Forests and Climate Change.

Conservation Status of Great Indian Bustard		
IUCN Red List	Critically Endangered	
Wildlife (Protection) Act, 1972	Schedule I	
CMS Convention	Appendix I	
CITES	Appendix I	

## 4.6 Climate Litigation

### Why in news?

Recent Supreme Court's ruling on right against climate change could energise climate litigation in India.

### Climate Litigation

- Climate litigation means legal action that aims to **combat climate change** and involves arguments which are related to climate change.
- It is one tool communities and individuals are using to force governments and corporations to do more to prevent dangerous climate change.
- **Categories-**
  - Cases relying on human rights enshrined in international law and national constitutions
  - Challenges to domestic non-enforcement of climate-related laws and policies
  - Litigants seeking to keep fossil fuels in the ground
  - Advocates for greater climate disclosures and an end to greenwashing
  - Claims addressing corporate liability and responsibility for climate harms; and
  - Claims addressing failures to adapt to the impacts of climate change.

### What is the Supreme Court's recent ruling on right against climate change?

- The Supreme Court of India has made a **significant ruling** that acknowledges the fundamental right of people to be free from the adverse impacts of climate change, it is seen as an extension from the *right to life* (Article 21) and *equality* (Article 14) under Indian Constitution.
- The court has recognized that the *right to a clean environment* is well established in Indian jurisprudence, and given the increasing damage caused by climate change, it is essential to establish a distinct right to be protected against its negative effects.

*Global Climate Litigation Report 2023 by UNEP identified 2,180 climate-related cases being heard by courts, tribunals and other adjudicatory bodies in 65 countries.*

- The central government sought to modify a 2021 order related to the bird's conservation, arguing that it was impractical and could hinder India's renewable energy development and its climate change commitments.
- The Supreme Court agreed to amend the order but also took the opportunity to address the broader issue of climate change risks.
- The ruling is expected to energize climate litigation in India, as it sets a precedent for the legal recognition of the right to be protected from climate change.
- It also reflects a global trend where courts are increasingly being approached to address climate-related issues.

*UN General Assembly's recognises the human right to a clean, healthy and sustainable environment.*

### Why there is global surge in climate litigation?

- **Diverse actors-** Children and youth, women's groups, local communities, and Indigenous Peoples are taking prominent role in bringing climate litigation cases.
- **Awareness generation-** Due to involvement of diverse actors, it fosters climate change governance reforms in many countries around the world.
- **Environmental rule of law-** Access to justice enables the protection of environmental law and human rights, promoting accountability in public institutions.
- **Connection with human rights-** Many cases brought before the courts show concrete links between human rights and climate change.
- **Global impact-** While most cases have been brought in the United States, climate litigation is taking root worldwide. About 17% of cases are now reported in developing countries, including Small Island Developing States.
- **Vulnerable voices-** Vulnerables, including children and youth, are making their voices heard globally. Cases have been brought by and on behalf of children as young as 7 and 9 years old in Pakistan and India.
- **Role of judiciary-** Sensitization of courts due to climate related issues due to increased litigation, it further enhances the accountability in government and corporate climate actions.

*As per Global climate litigation report India ranks 14<sup>th</sup> globally with 11 cases.*

### What is the status of climate litigation in India?

- **Role of judiciary-** National Green Tribunal deals exclusively with environmental matters, is the main forum for climate related cases but petitions routinely land in the High Court and Supreme Court.
- **Potential for new jurisprudence-** Supreme Court's ruling on right against climate change could lead to a new jurisprudence that balances human and socio-economic development with environmental and climate considerations.
- **Effectiveness of court rulings-** There is a question about the effectiveness of court rulings on climate change, particularly in enforcing rights related to climate change impacts.
- **Challenges-** The court may not be proactive in climate change cases as they are with other environmental issues due to complex nature of climate change and its socio economic implications.

### What lies ahead?

- Climate change is a complex issue that may not be fully addressed through litigation alone, as it involves multi-dimensional problems that exceed the capabilities of local, regional, or national governments.
- Courts may encourage the government to develop mitigation and adaptation strategies but are less likely to enforce such measures strictly.

## 5. GOVERNMENT POLICIES AND INTERVENTIONS

### 5.1 Maritime Anti-Piracy Act, 2022

#### Why in news?

Recently the Navy Chief Admiral R. Hari Kumar has said that the new maritime anti-piracy act, 2022 has been a great enabler as the Indian Navy completed 100 days of 'Operation Sankalp'.

## What are the key provisions of the Maritime Anti-Piracy Act, 2022?

Key aspects	About
<b>Applicability</b>	<ul style="list-style-type: none"> <li>It will apply to all parts of the sea adjacent to and beyond the limits of the Exclusive Economic Zone of India.</li> <li>It will be applicable beyond <u>200 nautical miles</u> from the coastline.</li> </ul>
<b>Definition of piracy</b>	<ul style="list-style-type: none"> <li>Piracy is defined as any illegal act of violence, detention, or destruction committed against a ship, aircraft, person or property, for private purposes, by the crew or passengers of a private ship or aircraft.</li> <li>Inciting or intentionally facilitating such acts would also qualify as piracy. It includes any other act that is considered as piratical under international law.</li> <li>Piracy also includes voluntary participation in the operations of a pirate ship or aircraft used for piracy.</li> </ul>
<b>Definition of ship</b>	<ul style="list-style-type: none"> <li>The Act defines ship as vessel or water craft, and</li> <li>Seaplanes and other aircraft capable of being used as means of transportation in water.</li> </ul>
<b>Personnel authorised for arrest and seizure</b>	<ul style="list-style-type: none"> <li>A warship or military aircraft of the <u>Indian Navy</u>,</li> <li>A ship or aircraft of the <u>India Coast Guard</u>, or</li> <li>Ships or aircraft on government service, and authorised for such purpose.</li> <li>Coastal police stations are now empowered to handle piracy cases.</li> </ul>
<b>Offences and penalty</b>	<ul style="list-style-type: none"> <li>Attempt to cause death- Life imprisonment or death.</li> <li>Attempt to commit or aid piracy- up to 10 years of imprisonment, or fine, or both.</li> <li>Participating, organising or directing others to commit piracy- up to 14 years of imprisonment or fine or both.</li> </ul>
<b>Extraditable offences</b>	<ul style="list-style-type: none"> <li>The accused can be transferred to any country for prosecution with which India has signed an extradition treaty.</li> <li>India has an agreement with Somalia where Somalian pirates have been extradited since 2017</li> </ul>
<b>Jurisdiction of designated court</b>	<ul style="list-style-type: none"> <li>Designated courts- The central government, in consultation with the <u>Chief Justice of the concerned High Court</u>, can notify <u>Sessions Courts</u> as the designated courts under this Act.</li> <li>Port or place of disembarkation within India of the person suspected or accused will be taken into account while deciding jurisdiction of the Court.</li> </ul>
<b>Offences covered</b>	<ul style="list-style-type: none"> <li>The designated court will try offences committed by a person in the custody of the Indian Navy or Coast Guard, <u>regardless of nationality</u>.</li> <li>A citizen of India, a resident foreign national in India, or a stateless person.</li> <li>The court may try a person even if they are <u>not physically present</u> in the court.</li> <li><b>Exemptions-</b> Warships and government owned ships employed for non-commercial purposes are not under jurisdiction of the court.</li> </ul>
<b>Offences over foreign ship</b>	<ul style="list-style-type: none"> <li>The Court does not have jurisdiction over offences committed on a foreign ship unless an intervention is requested by                             <ul style="list-style-type: none"> <li>The country of origin of the ship</li> <li>The ship owner</li> <li>Any other person on the ship</li> </ul> </li> </ul>

## What is the significance of the Act?

- It is the **first domestic law** to empower Indian authorities and courts to deal with piracy and pirate ships on the high seas.
- **Maritime security**- The Act ensures maritime security which is the key to safeguarding India's security and economic well-being.
- **Navigation security**- More than 90% of India's trade takes place by sea routes and over 80% of the country's hydrocarbon requirements was sea-borne, security of these routes and lanes of communication is critical.
- **Increased authority**- Earlier only allocated police station in Mumbai was handling piracy cases, now it empowers all coastal police authorities which has been a great enabler for the security forces particularly for Navy.
- **Align with UNCLOS, 1982**- It is an essential step for India to fulfill its international obligations under the United Nations Convention on the Law of the Sea (UNCLOS) and enhance its maritime security which has defined piracy and given a uniform international legal framework for combatting acts of piracy.

India ratified  
UNCLOS in 1995.

## Operation Sankalp

- **Launch year**- 2019
- **Origin**- It was started as there were explosions in oil tanker ships in the Gulf of Oman amid tensions between Iran and the US.
- **Aim**- To ensure safe passage of Indian Flag Vessels transiting through the *Strait of Hormuz*.
- **Need**- Based on the threat assessment in the region, the Indian Navy is conducting maritime security operations in
  - Gulf of Aden and adjoining areas,
  - Arabian Sea and
  - Off the East Coast of Somalia
- **IFC-IOR**- Information Fusion Centre- Indian Ocean Region of the Indian Navy at *Gurugram* has played a transformative role as a principal hub for enabling information exchange in Indian Ocean Region.
- **Significance**- It has played a pivotal role as the *'First Responder'* and *'Preferred Security Partner'* in the Indian Ocean Region.
- **Role**- The naval ships, aircraft and Special Forces have demonstrated an unflinching resolve to *'secure the seas'* and protect the maritime community from various non-traditional threats present in the region.

## 6. GOVERNANCE

### 6.1 Technology to Advance Criminal Justice

#### Why in news?

Recently the Chief Justice of India emphasized the critical role of technology in advancing criminal justice on Central Bureau of Investigation (CBI) Raising Day.

#### What are the applications of AI in criminal justice reforms?

- **Predictive policing**- AI can assist law enforcement agencies in identifying potential crime hotspots and patterns, which can aid in the deployment of resources and personnel.
- **Case management**- AI-driven systems can streamline case management processes by automating scheduling, reminders, and document management.
- **Evidence analysis**- AI can assist in the analysis of evidence, including fingerprint matching, facial recognition, and voice analysis.

The National Intelligence Grid (NATGRID) is the integrated intelligence master database structure for counter-terrorism purposes connecting databases of various core security agencies under the Government of India.

- **Legal research-** AI-powered legal research tools can help lawyers and judges access relevant case law, legal precedents, and statutes quickly, aiding in the interpretation and application of legal provisions of CrPC, Indian Penal Code, 1860 and Indian Evidence Act, 1872 provisions during trials and hearings.
- **Judicial decision making-** AI can provide data-driven insights to assist judges in making informed decisions regarding sentencing and parole.
- **Data management-** AI can help manage vast volumes of data and evidence, ensuring that it is securely stored and easily accessible.
- **Risk assessment algorithms-** AI driven risk assessment tools can be used for bail, sentencing, and parole decisions.
- **Forensic analysis-** AI is being used in forensic analysis, including the examination of digital evidence, fingerprints, and DNA.
- **Facial recognition-** It can be used in identifying suspects and improving surveillance.
- **Legal aid-** AI-driven chatbots and virtual assistants can provide legal information and assistance to individuals who may not have access to legal counsel, helping them understand their rights and responsibilities under the legal framework such as Criminal Procedure Code, 1973.

### What are the benefits and challenges of technology in criminal justice reforms?

Benefits	Challenges
<ul style="list-style-type: none"> <li>• <b>Enhanced efficiency-</b> AI can automate routine tasks, leading to quicker case processing.</li> <li>• <b>Cost effective-</b> It would lead to potential cost savings for law enforcement agencies.</li> <li>• <b>Reduced bias-</b> AI can help minimize human biases in decision-making processes.</li> <li>• <b>Improved resource allocation-</b> AI can optimize resource allocation by identifying crime hotspots and allocating police resources accordingly.</li> <li>• <b>Reduce case backlog-</b> By automating routine tasks and document processing, AI can help reduce the backlog of cases in the criminal justice system, ensuring that justice is delivered in a timely manner.</li> <li>• <b>Reduce complexities-</b> Creation of Network for Evidence Tracing, Research, and Analysis (NETRA) is a significant leap forward in CBI which is designed to handle complex criminal investigations by analysing digital evidence.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Biased data-</b> If historical criminal justice data contains biases, AI algorithms may reinforce those biases, leading to unfair outcomes.</li> <li>• <b>Data privacy-</b> The use of AI in criminal justice necessitates the collection and analysis of large datasets, raising concerns about the privacy and security of sensitive information.</li> <li>• <b>Lack of transparency-</b> The deployment of AI in law enforcement may raise ethical questions and concerns among the public, requiring transparent policies and communication to build and maintain trust.</li> <li>• <b>Technical limitations-</b> The technical limitations may result in errors and misinterpretations which needs human oversight.</li> <li>• <b>Skewed data-</b> It could lead to community-based profiling of marginalized social groups, potentially violating privacy rights and disproportionately targeting specific communities.</li> </ul>

### How to address the ethical considerations in criminal justice reforms?

- **Equitable distribution-** The benefits of digitization should reach everyone regardless of their background is essential, mechanism should be in place to address the digital divide.
- **Digitization of foundational processes-** Paying attention to foundational processes, such as filing of First Information Reports (FIRs) is crucial which would enhance transparency and allow for tracing back the sequence of events.
- **Synchronization with court procedure-** Investigations should align with court procedures to ensure effective and time bound prosecutions, the complexities of cases undertaken by Central Bureau of Investigation necessitates meticulous adherence to legal parameters.
- **Institutional commitment-** It involves dedicated financing for infrastructure upgrades, synergies across different wings of criminal justice administration and calibrated strategies to keep personnel informed about rapid environmental changes.
- **Integrating technology-** A multi-pronged approach to integrate technology with court procedures is recommended, it aims to prevent the severity of accusations and excessive delays in CBI courts from leading to a presumption of guilt.

- **Virtual court model-** The e-committee of the [Supreme Court](#) has developed a virtual court model, once implemented it will enable simultaneous conversion of speech into text.

### What lies ahead?

- CJI has emphasized that importance of establishing adequate safeguards to prevent the misuse of AI and other advanced technologies.
- AI should be wielded within ethical boundaries to uphold the integrity of the justice system.

### NETRA Lab

- **Ministry-** Ministry of Personnel, Public Grievances and Pensions
- **Vision-** To further strengthen investigative processes of CBI in the digital domain.
- **Mission-** To extract data from the electronic footprints, process it into actionable intelligence and aid investigation process
- **Purpose-** It is designed to handle complex criminal investigations by analysing digital evidence.
  - It covers a wide range of sources, including mobile devices, cloud storage, and e-Discovery data.
  - It plays a crucial role in expediting the investigation process and contributes to deliver justice efficiently.

## 7. HEALTH

### 7.1 The WHO Pandemic Agreement

#### Why in news?

Recently the 9<sup>th</sup> meeting of the Intergovernmental Negotiating Body (INB) was convened to develop a revised draft of the negotiating text of the WHO Pandemic Agreement.

#### How Intergovernmental Negotiating Body evolved?

*The 'pandemic treaty' was first proposed by Chile and the European Union (EU).*

- **Launch year-** 2021,
- **Established by** - World Health Assembly
- **Aim-** To draft and negotiate a convention, agreement or other international instrument under the Constitution of the World Health Organization to strengthen pandemic prevention, preparedness and response.
- **Need-** In light of the impact of the COVID-19 pandemic, World Health Organisation's 194 Member States established a process to draft and negotiate a new convention, agreement, or other international instrument on pandemic preparedness and response.
- **Principles-** The INB's work is based on the principles of inclusiveness, transparency, efficiency, Member State leadership and consensus.

#### What are the key features of the treaty?

- **Aim-** To strengthen global defences against pandemics and prevent catastrophic crises by addressing systemic failures revealed by COVID- 19.
- **Pathogen surveillance-** Strengthening surveillance for pathogens with pandemic potential.
- **Workforce capacity-** The health care workforce should be enhanced to respond to pandemics effectively.
- **Improve logistics-** The supply chain resilience should be improved for medical products and equipment.
- **Technology transfer-** Facilitating the transfer of technology to support the production of vaccines, diagnostic tests, and treatments.
- **Intellectual Property (IP) Waiver-** Address the issue of intellectual property rights to ensure equitable access to medical products.
- **WHO PABS System-** Pathogen Access and Benefit Sharing system establishes a mechanism for sharing pathogen information while ensuring equitable access to benefits derived from research.
- **Accountability-** Robust governance, enforcement and accountability measures within the treaty framework.

### What is the significance of the treaty?

- **Equitable access to benefits-** In PABS system, countries would share genome sequence information and samples with WHO-coordinated networks and databases .
- In exchange, manufacturers of diagnostics, therapeutics, and vaccines would be required to provide
  - 10% of their products free of charge
  - 10% at not-for-profit prices
- **Legal obligation-** The legal obligation on provision sharing aims to establish legal obligations for all users of biological materials and genetic sequence data under PABS.
- **Importance of robust PABS system-** It is useful for particularly low- and middle-income countries, including some African nations, as it promotes equitable access to medical countermeasures.
- **Establishment of COP-** It proposed for establishment of the Conference of Parties (COP) to oversee the implementation of the Pandemic Agreement.

*The COP suggests that the Agreement could be a classic international treaty adopted under Article 19 of the WHO Constitution as opposed to the alternative Article 21 opt-out regulations.*

### What are the concerns with the treaty?

- **Concern of developed countries-** Countries such as Australia, Canada, UK, US and European Union have termed the proposed text as *step backwards* particularly regarding the financing and IP.
- **Hesitancy to share information-** Developing countries are cautious about sharing information on pathogen spread and evolution, especially if they perceive little benefit in return, it is exacerbated during COVID-19 pandemic due to vaccine nationalism.
- **Global governance challenges-** The absence of adequate enforcement mechanisms hampers coordinated efforts for pandemic countermeasure stockpiles.
- **Lack of enforcement-** The Pandemic Agreement faces significant challenges due to the absence of robust enforcement mechanisms.
- **Risk of ineffectiveness-** Even if the Global North reaches consensus on key issues like technology transfer, the PABS System, and intellectual property waivers, the Agreement could still be rendered ineffective without robust enforcement.
- **Concern with existing regulations-** The international health regulations are legally binding but they fail to prevent unjust travel or trade restrictions and the hoarding of vaccines and other medical countermeasures during the COVID-19 pandemic.
- **Issue with COP-** The COP model mirrors the UN Framework Convention on Climate Change (UNFCCC) summits where all nations receive equal voting rights but it remains uncertain whether negotiators will reach consensus on this structure.
- **IP requirement-** The firms that received public financing need to waive or reduce their IP royalties remains a critical point of debate as pharmaceutical industry is not satisfied with this provision.

*Vaccine nationalism is a scenario where the wealthy countries sign deals with pharmaceutical companies directly to secure vaccines for their own populations limiting the stock available for others.*

### What lies ahead?

- The pandemic agreement underscores the understanding that no single government or institution can effectively combat the threat of future pandemics in isolation.
- India underscores the importance of clarity in defining roles and responsibilities especially between developed and developing nations to achieve equitable outcomes.

### International Health Regulations

- The International Health Regulations was adopted after the **2002-2003 SARS outbreak**.
- In 2005, it set out countries' obligations where public health events have the potential to cross borders.
- These include advising the WHO immediately of a health emergency and measures on trade and travel.
- These regulations are still considered appropriate for regional epidemics, such as Ebola but inadequate for a global pandemic.

## 7.2 Youth Suicide in India

### Why in news?

India's suicide rate reached a record high in 2022, with a significant portion of these tragedies involving the youth, indicating a critical public health issue.

#### Status of suicide in India

- National Crime Records Bureau (NCRB) reports that 1.71 lakh people died by suicide in 2022.
- The suicide rate has increased to 12.4 per 1,00,000 – the highest rate ever recorded in India since 1967.
- The report reveals that *41% of all suicides are by young people* below the age of 30.
- As per NCRB 2021 data the highest number of student suicides is reported in Maharashtra followed by Madhya Pradesh and Tamil Nadu.
- Suicide is the leading cause of mortality for *young women* in India.
- A Lancet study stated that suicide death rates in India are among the highest in the world and a large proportion of adult suicide deaths occur between the ages 15 and 29.
- A young Indian dies by suicide *every 8 minutes*, which is a loss to family, society, the economy and future of the country.

### What are the causes of suicide in young people of India?

- **Mental health issues-** Depression, anxiety, and other mood disorders are significant contributors to suicidal behavior among young people.
- **Family issues-** *Negative or traumatic family dynamics*, including domestic violence, parental pressure and intergenerational conflicts, can exacerbate stress and contribute to suicidal ideation among youth.
- **Academic stress-** The intense pressure to perform well academically, driven by societal expectations and a *competitive education system*, can lead to feelings of inadequacy and hopelessness among students.
- **Social factors-** Peer pressure, social isolation and unhealthy lifestyle habits can increase vulnerability to suicidal behaviour among young people.
- **Exposure to violence-** It can be in the form of *physical or sexual abuse* which can have long lasting psychological effects and increase the risk of suicide among youth.
- **Gender specific factors-** Early marriage, gender based violence, and rigid gender roles contribute to highest rate of suicide among young girls and women.
- **Addiction-** Substance abuse, alcohol and excessive internet use particularly among college students are associated with increased suicidal behaviour.
- **Media influence-** Sensationalized media coverage of suicide especially when involving celebrities, can contribute to suicidal ideation among vulnerable individuals.

### How to address the issue of suicide among young people in India?

- **Mental health awareness-** Schools, colleges, and community organizations can play a crucial role in providing support services and promoting mental well-being among students.
- **Early intervention-** Identifying and addressing mental health problems at an early stage is essential in preventing suicidal behavior. Schools should have *counsellors or mental health professionals* who can provide support to students facing academic stress, family issues etc.,
- **Family support-** Providing parents with education and resources on parenting skills and communication can help prevent conflicts and enhance family relationships.
- **Educational reforms-** The education system should focus on holistic development rather than solely academic achievements. Alternative assessment methods, career guidance, and opportunities for exploring diverse interests can reduce the pressure on students and alleviate the fear of failure.

*One-third of young people are cyber-bullied.*

*And of this sub-set, one third are suicidal.*

*Teens who used social media for more than 2 hours a day are more suicidal.*

- **Regulate media reporting-** Implementing guidelines for responsible reporting of suicide and promoting positive narratives of resilience and hope can mitigate this risk.
- **Prevent substance abuse-** Addressing substance abuse issues through awareness campaigns, access to treatment services, and regulation of alcohol and drug sales can help reduce the risk of suicide among young people.
- **Community engagement-** Building strong support networks within communities and empowering local organisations to provide mental health services and interventions can enhance resilience and prevent social isolation among youth.
- **Implementation of National Suicide Prevention Strategy-** It was launched by the *Ministry of Health* should be effectively disseminated and implemented across all states.
- **Research-** Continual research and data collection are essential for understanding the evolving trends and risk factors associated with youth suicide.
- **Crisis intervention services-** Establishing helplines, crisis intervention centers, and online support platforms can provide immediate assistance to individuals in distress and prevent suicidal acts.

### Steps taken by India to tackle mental health related issues

- **National Mental Health Program, 1982-** It focuses on ensuring the availability and accessibility of minimum mental healthcare for all.
- **National Mental Health Policy, 2014-** A policy designed to promote mental health, prevent mental illness, and ensure socio-economic inclusion of those affected by mental illness.
- **Mental Health Act, 2017-** It provides for mental healthcare and services for persons with mental illness and to protect, promote and fulfil the rights of such persons during the delivery of mental healthcare and services.
- **NIMHANS:** The National Institute of Mental Health and Neurosciences in Bengaluru, a premier institution for mental health and neuroscience education and research.
- **Training** - Online capacity building of health workers by NIMHANS in providing psychosocial support and training through (iGOT)-Diksha platform
- **KIRAN-** A toll-free, 24/7 helpline providing support for individuals facing mental health issues.
- **MANAS Mitra:** A mobile application aimed at promoting mental well-being.
- **Tele-MANAS helpline, 2022-** A telecommunication service that offers mental health support to those in need.

## 7.3 Sugar Processed Foods

### Why in news?

As per recent report Nestle's products for babies in Asia, Africa and Latin America were found to contain added sugars, while the same products sold in Europe did not have it.

### Regulation of sugar

- **Sugar-** It is the generic name for sweet-tasting, soluble carbohydrates, many of which are used in food.
- **Artificial sweeteners-** They are sugar substitutes that are used to sweeten foods and beverages with very little to no calories.
- **Regulation-** Food Safety and Standards (Advertising and Claims) Regulations 2018, the FSSAI said that only if total sugar is **less than 5g per 100g** in a product, it can claim to be 'low on sugar.' Any product which is 'low on sugar,' can potentially be healthy.
- **WHO-** World Health Organisation has advised against the introduction of added sugars before the age of 2, it also recommends limiting free sugar intake to less than 10% of total energy intake with future benefits by reducing intake to less than 5% of total energy.

### What are the key highlights of recent report on Nestle's products?

- **Report by-** Public Eye in collaboration with the International Baby Food Action Network (IBFAN)

- **Discrepancy in nutritional standard-** Nestle was criticized for applying different nutritional standards in different countries.
- **High level of sugar-** Baby food products marketed in *low and middle-income countries* as healthy and essential for children's development were found to contain high levels of added sugars, similar products sold in Switzerland where Nestle is headquartered did not contain added sugars.
- **Lack of transparency-** The report pointed out that Nestle did not provide clear information about the quantity of sugar content on the packaging of its products, this could *mislead parents* into believing that these products are healthier than they actually are.
- **Health risks-** The presence of added sugars in baby food products poses risks to children's health, excessive sugar consumption can contribute to various health issues including obesity, *diabetes* and dental problems.
- **Poor diet habits-** Introducing babies to sweet tastes at a young age may also reinforce a preference for sugary foods, leading to poor dietary habits later in life.

### What are the harmful effects of added sugars particularly for babies?

- **Nutritional impact-** Consuming foods high in added sugars can lead to imbalances in the diet, potentially displacing more nutritious foods and nutrients.
- **Impact on health-** Excessive sugar intake is associated with an increased risk of obesity, type 2 diabetes, cardiovascular disease, and dental caries. Babies and young children are especially vulnerable to these health risks due to their developing bodies and eating habits.
- **Long term effects-** Experts warn that high sugar intake can put pressure on *baby's pancreas* potentially leading to diabetes and obesity in the future, excess sugar can turn into triglycerides, leading to *fatty liver and insulin resistance*.
- **Regional health disparity-** World Health Organization (WHO) has issued a warning about the alarming *increase in obesity* rates, especially in low and middle-income countries, where it has escalated to "epidemic proportions."
- **Surge in NCDs-** The rise in obesity is contributing to a surge in non-communicable diseases like *cardiovascular disease, cancer and diabetes*. One of the primary culprits behind this epidemic is the heightened consumption of highly processed foods that are often loaded with sugar.
- **Impact of Maltodextrin-** Maltodextrin is used to enhance the flavour and texture but has *higher glycemic index* than a table sugar, which can quickly raise blood sugar levels.
- **Addictive nature-** Sugar has addictive properties and can lead to cravings for sweet foods, this may predispose them to develop a preference for sweet tastes potentially leading to overconsumption of sugary foods in the future.
- **Tooth decay-** Early exposure to sugar, especially through frequent consumption of sugary foods and beverages can increase the risk of tooth decay and dental cavities in infants and young children.

Indian Council of Medical Research study estimates that 101.3 million people in India could be diabetic.

Glycemic index is a measure used to determine how much a food can affect your blood sugar levels.

### What lies ahead?

- Government authorities are warning against branding items with added sugar as "healthy" and have called out *misleading promotion* and marketing tactics.
- The impact of high sugar processed food is a *global health concern*, hence it underscores the need for better dietary practices and policies to combat these trends.

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

- **Establishment** - It is a statutory body established under the *Food Safety and Standards Act, 2006*.
- **Ministry** - *Ministry of Health & Family Welfare*. **Headquarters** - Delhi
- **Function** - To regulate and monitor, manufacture, processing, distribution, sale and import of food while ensuring safe and wholesome food to the consumers.
- To protect and promote public health through the regulation and supervision of food safety.
- **State Food Safety Index-** It is released annually by FSSAI to measure the performance of states on parameters of food safety.

## 8. INTERNATIONAL ISSUES

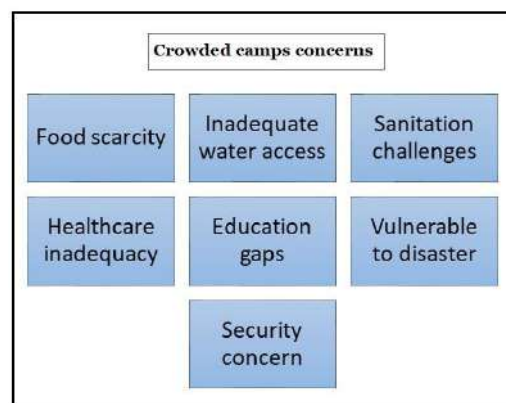
### 8.1 Rohingya Refugee Crisis

#### Why in news?

Recently Rohingya refugees are rescued in the waters of West Aceh, Indonesia has once again drawn attention to the plight of the refugees who are increasingly embarking on dangerous sea journeys to seek a better life.

#### Who are Rohingya refugees?

- The Rohingya are a Muslim minority ethnic group with historical ties to the Arakan kingdom in Myanmar (formerly known as Burma).
- The term "Rohingya" is derived from the word "Arakan" in the Rohingya dialect, with "ga" or "gya" meaning "from."
- Despite claiming generations of residence in Myanmar's Rakhine State, the Rohingya face challenges due to successive governments labelling them as illegal immigrants from Bangladesh.
- **Unique tradition-** Their cultural and religious distinctiveness sets them apart from the majority Buddhist population in Myanmar, and they speak a Bengali dialect different from the common Burmese language.
- Unfortunately, Myanmar has denied them recognition as an ethnic group, rendering them the world's largest stateless population, devoid of fundamental rights and security.
- **Myanmar's 1982 citizenship law-** Rohingya community members (along with other ethnic minorities) can only attain citizenship if they can prove their ancestors resided in Myanmar before 1823.
- Otherwise, even if one of their parents is a Myanmar citizen, they are classified as "resident foreigners" or "associate citizens".
- **Forced displacement-** The Rohingya have been fleeing Myanmar in large numbers since violence erupted in 2012 and escalated dramatically in 2017, resulting in what the UN described as "ethnic cleansing."
- **2017 crisis-** A massive wave of violence erupted in Rakhine, forcing over 750,000 people to seek sanctuary in Bangladesh.
- The brutality of security forces resulted in entire villages being razed, families torn apart, and severe human rights violations, including mass rape.
- Over the years, Rohingya seeks refuge in neighbouring countries such as Bangladesh, Thailand, Indonesia, Malaysia and India.
- **UN fact finding commission-** In 2018, the commission accused Myanmar of having genocidal intent against the Rohingya, it uncovered clear patterns of abuse by the military, including systemic targeting of civilians, sexual violence etc.,
- **Refugee camps in Bangladesh-** An estimated 960,000 Rohingya live in refugee camps in Bangladesh where they are primarily located near Myanmar border in Cox's bazar which houses some of the world's largest and most densely populated refugee camps.
- **Overcrowded camps-** The refugee camps lack basic human necessities



#### What are the issues that Rohingya face in high sea journeys?

- **Risk high sea journeys-** Returning to Myanmar is virtually impossible and worsening conditions in Bangladeshi relief camps, many Rohingya risk dangerous journeys.
- **Reach other countries-** They undertake treacherous voyages across the Bay of Bengal and the Andaman Sea to reach Muslim-majority nations like Indonesia and Malaysia.

- **Exploitation**- Human traffickers exploit their desperation, charging exorbitant amounts to ferry, they are often given inadequate space and basic supplies, violence against women have been documented.
- **Stranded refugees**- Some Rohingya remain stranded at sea for weeks because countries are reluctant to accept refugees.
- **Illegal immigration**- Some countries detain the refugees along the route on illegal immigration charges, enduring lengthy incarceration without resolution.
- **Deadliest stretch of waters**- UN has estimated that 1 in 8 Rohingya individuals attempting the sea route either dies or disappears rendering Andaman sea and Bay of Bengal among the deadliest stretches of water globally.



### What lies ahead?

- The UN refugee agency urgently calls upon regional coastal authorities to take timely action, emphasizing that saving lives and rescuing those in distress at sea is both a humanitarian imperative and a longstanding duty under international maritime law.
- Rohingya crisis requires concerted efforts from the international community to ensure the safety, dignity, and rights of Rohingya refugees are upheld.
- This includes providing adequate humanitarian assistance, addressing the root causes of the crisis in Myanmar, and holding accountable those responsible for human rights violations against the Rohingya population.

## 8.2 Iran Israel Conflict

### Why in news?

Iran launched drones and missiles towards Israel, in retaliation for an Israeli attack on its consulate that occurred in Damascus, Syria.

### History of Iran and Israel relations

- Iran was one of the first countries in the region to recognise Israel after its formation in 1948.
- **First Arab Israeli war**- In 1948, the opposition of Arab states to Israel led to the first Arab-Israeli war. Iran was not a part of that conflict, and after Israel won, it established ties with the Jewish state. It made Iran the second Muslim-majority country after Turkey to take such a step.
- **Israel's diplomacy**- It was part of Israel's "periphery doctrine", a strategy that aims to build alliances with non-Arab countries in the Middle East.
- **Pahlavi dynasty**- Under Shah Mohammad Reza Pahlavi, Iran maintained close ties with the US and Israel, even selling oil to Israel during Arab economic boycott.
- **Islamic Revolution, 1979**- The overthrow of the Shah led to the establishment of a religious state in Iran, altering its stance on Israel to view it as an occupier of Palestinian territories.
- **Iran's regional ambitions**- Post revolution, Iran aimed to expand its influence, challenging regional powers like Saudi Arabia and Israel, both US allies.
- **Iran Iraq accord, 1975**- Iran ceased support for Kurdish-Iraqi separatists, reduced hostilities and affected Israel's strategic value to Iran.



- **Nuclear facility attack-** Israel periodically targeted Iran’s nuclear facilities to hinder Iran’s potential development of nuclear weapons.
- **Stuxnet cyberattack, 2010** US and Israel reportedly created Stuxnet, a computer virus that disrupt Iran’s *Natanz nuclear facility*, marking a significant moment in cyber warfare.
- **Iran’s proxy support-** Iran's support for militant groups like Hezbollah and Hamas, which oppose Israel and the US further escalate tensions between two countries.

**What is the current issue?**

- **Hamas attack-** On October 7, 2023 Hamas-led militants storm across the border into Israel, Hamas hopes that other regional adversaries of Israel would join the conflict.
- **Militants involvement-** Hezbollah, Houthi which are backed by Iran have involved in Israel-Hamas, they pressure Israel to cease war with Hamas.
- **Damascus strike-** Israeli war jets targeted an Iranian consulate in Syria, resulting in the death of senior Iranian military commanders.
- **Iran aerial assault-** Iran launched over 300 drones and missiles on Israel as a response to Damascus strike, a significant attack that was largely neutralized by Israel’s defence system and international support.
- **Support from US-** US played a significant role in countering the attack, deploying air defence missiles and aircraft in the region.

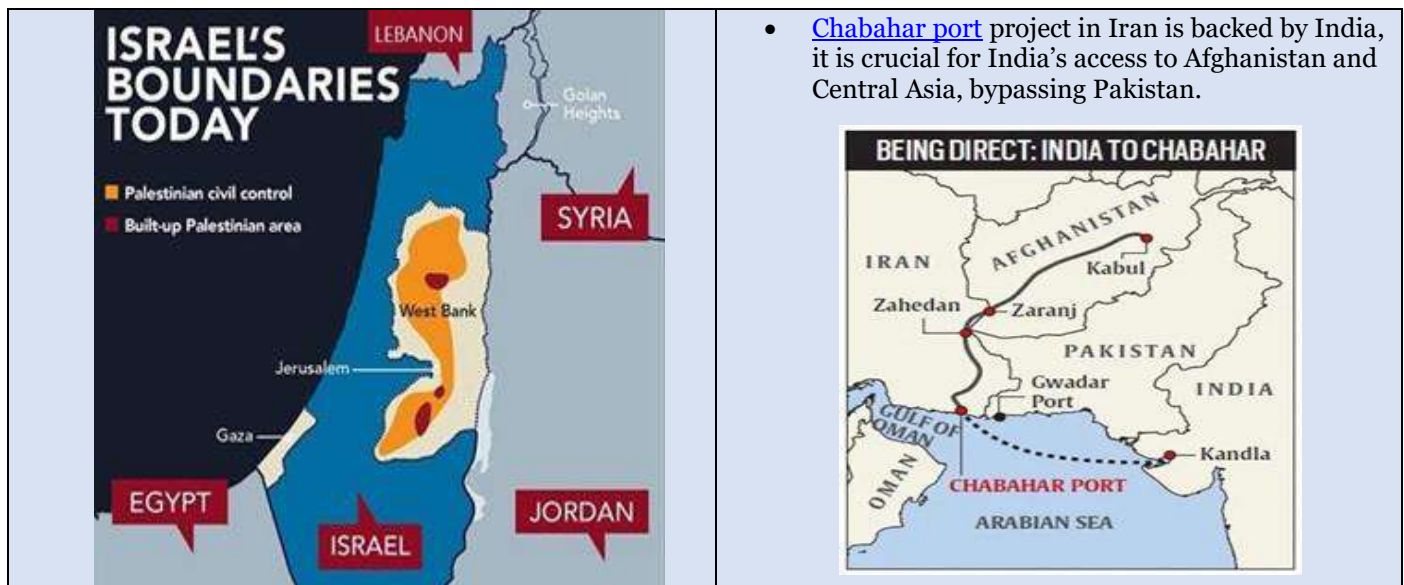
**Regional groups supported by Iran**

- **Hamas-** It originated during the first Intifada in 1987 to establish a Palestinian state, it has governed the *Gaza Strip* since 2007.
- **Palestine Islamic Jihad, 1979-** It is the second-largest militant group in the *Gaza Strip and the West Bank*, it receives financial assistance and training from Iran.
- **Hezbollah-** It means “Party of God” set up by Iran’s Revolutionary Guards in 1982 to fight Israeli forces that had invaded *Lebanon* that year.
- **Houthis-** They have been engaged in *Yemen’s civil war* for over a decade, they attacked ships in the Red Sea during Israel Hamas conflict disrupting a major shipping route between Europe and Asia it is supported by Iran.
- **Popular mobilisation Forces-** It is *Iraq’s state sanctioned coalition* of paramilitary groups they maintain close ties with Iran’s Revolutionary Guards.

**What is India’s stake in Iran Israel conflict?**

- **Strategic balance-** India has managed to maintain diplomatic ties with both Iran and Israel, balancing its interests in the region for decades.

Israel	Iran
<ul style="list-style-type: none"> <li>• India recognised Israel in 1950 and <i>full diplomatic relations</i> were established after the opening of embassies in 1992.</li> <li>• India has benefited from Israeli expertise and technologies in <i>agriculture</i> such as horticulture mechanization, protected cultivation etc.,</li> <li>• The relationship with Israel is particularly strong in <i>defence and security</i>, with Israel being a major arms supplier to India.</li> <li>• India-Israel cooperation in <i>S&amp;T</i> is overseen by the Joint Committee on S&amp;T, established under the S&amp;T Cooperation Agreement signed in 1993.</li> <li>• There are approximately 85,000 Jews of Indian-origin in Israel (with at least one Indian parent), who are all Israeli passport holders.</li> </ul>	<ul style="list-style-type: none"> <li>• India and Iran established <i>diplomatic links</i> in 1950.</li> <li>• Iran has been a significant supplier of <i>crude oil</i> to India, although this has been affected by international sanctions.</li> <li>• In 2018, India and Iran signed an <i>Agreement for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion</i> with respect to taxes on income.</li> <li>• Both India and Iran share concerns over <i>terrorism</i>, particularly from Pakistan and Afghanistan and the situation with Taliban.</li> <li>• India over the years has emerged as one of the favourite tourist destinations for Iranian tourists and every year around 40,000 Iranians visit India for various purposes.</li> </ul>



- [Chabahar port](#) project in Iran is backed by India, it is crucial for India's access to Afghanistan and Central Asia, bypassing Pakistan.

**What lies ahead?**

- India's consistent call for calm and restraint underscores its desire to maintain peace and prevent the escalation of hostilities within its borders and in the region.
- India's stance is a reflection of its broader foreign policy approach, which seeks to navigate complex international relations while upholding its national interests.


**8.3 Baloch - Pakistan Issue**

**Why in news?**

The Majeed Brigade of the separatist group Baloch Liberation Army (BLA) has claimed responsibility for recent attack on a complex outside Pakistan's strategic Gwadar Port.

**Why Balochistan remains problem in Pakistan?**

- Balochistan, in Pakistan's southwest, is the **country's largest and most sparsely populated** province.
- **Population-** Ethnic Baloch live in Pakistan, Iran and Afghanistan, the Baloch nationalism traces its roots to the early decades of the 20th century, when new international borders came to be drawn in the region.
- **Accession of Balochistan-** At the time of Partition, Balochistan was composed of multiple chiefdoms under British influence. Ahmed Yar Khan, chief of Kalat, sought independence for his people but was compelled to accede in 1948 after Pakistan's invasion of Kalat.
- **Insurgency-** The forced accession of Balochistan led to a series of insurgencies characterized by violent confrontations between Baloch nationalists and the Pakistani state.



## BALOCHISTAN FACTS

**Accession**

The rulers of the princely state Khanate of Kalat, a major constituent of Balochistan, refused to join Pakistan in 1947. It was annexed to Pakistan in a military operation in 1948 and Yar Khan, the then ruler, signed the treaty of accession while his brothers and followers declined to surrender

**Insurgency**

After the 1948 military action, rebellion crisis erupted in 1958, in 1962-63 and 1973-77. Pakistan has even used its air force against the Baloch people to counter insurgency. Fresh tensions started with General Pervez Musharraf coming to power in Pakistan in 1999. There were large scale military build-up in the region which rebels fought against

**Strategic Importance**

- Balochistan is a mineral rich state and holds immense revenue potential for Pakistan
- China has proposed economic corridor to link Pakistani port of Gwadar with Kashgar, a trading hub in western China
- Iran-Pakistan gas pipeline is planned to go through Balochistan

**Separatist Groups**

- Balochistan Liberation Army (BLA)
- The Baloch Republican Party
- Baloch Liberation Front

- **State repression-** Pakistani security forces have been accused of brutal repression, including extrajudicial killings, torture, and enforced disappearances of Baloch activists, journalists, and civilians.
- **Ethnic differences-** The conflict's persistence can be attributed to ethnic differences as Balochistan's people have a distinct history, language, and culture, which sets them apart from Punjabis or Sindhis.
- **Power imbalance-** Pakistan's formation is based on religion led to skewed power dynamics among different Muslim ethnicities this could be witnessed from Punjab landlords as they held significant influence over the bureaucracy.
- **Economic injustice-** Despite Balochistan's significant natural resources, including oil reserves and strategic locations such as Gwadar Port, the Baloch people have not reaped the benefits.
- **Marginalization-** Economic disparities, including unemployment and preferential treatment of outsiders in job opportunities, have fueled resentment among the Baloch population.
- **Growing militancy-** Baloch nationalist groups, including the Baloch Liberation Army (BLA), have formed alliances with Islamist organizations like the Tehreek-e-Taliban Pakistan (TTP) and the Islamic State.
- **Political turmoil-** In 1974 then Prime Minister Zulfikar Ali Bhutto was assassinated as he was unwilling to grant significant autonomy to Balochistan situation, this marked the significant violence for nationalism.
- **Majeed Brigade-** It is a dedicated suicide squad within the Baloch Liberation Army (BLA) which has been responsible for carrying out high-profile attacks targeting security personnel, government officials, and infrastructure, including Chinese interests in Pakistan.

### Why India's role is significant in in Baloch-Pakistan issue?

- **Strategic location-** Balochistan is a region that spans across Pakistan, Iran, and Afghanistan, and has a strategic position at the mouth of the Persian Gulf, a vital waterway for global oil trade.
- **Maritime connectivity-** Balochistan also has access to the Arabian Sea and the Indian Ocean, making it a potential hub for maritime connectivity and trade.
- **Geopolitical dynamics-** Balochistan is home to Baloch minority which is strategically important for the global powers that are competing for influence in Central Asia and the Middle East.
- **New great game-** It refers to the rivalry and competition among regional and global powers for influence and resources in Central and South Asia, especially in Afghanistan and its neighbouring countries.
- **China factor-** China has a strategic interest in Gwadar, a port city in Balochistan, as part of its Belt and Road Initiative and its naval ambitions in the Indian Ocean.
- **Security concerns-** Balochistan's proximity to Afghanistan, where the [Taliban regime](#) has recently taken over, adds to the complexity and uncertainty to the regional security dynamics.
- **Change in foreign policy-** India as a rising power with growing economic and security interests in the region, needs to rethink its traditional neutrality and passive approach in the Middle East and Central Asia.
- **Chabahar port-** It is situated in Iran, the port is developed by India, it directly competes with Pakistan's China

*Amnesty International report from 2011 highlighted the use of 'kill and dump' strategies by Pakistani forces.*

### Gwadar port

- **Location-** It is situated on the Arabian Sea at Gwadar in Balochistan province of Pakistan.
- **Strategic connectivity-** It is deep sea port that connects South Asia with Central Asia, Middle East, Africa and Europe.
- **Operational control-** China since 2013.
- **Significance-** It is the lynchpin of [China-Pakistan Economic Corridor](#) (CPEC) plan, and is considered to be a link between the Belt and Road Initiative and the Maritime Silk Road projects.
- **CPEC-** It aims to connect the deep-sea Pakistani ports of Gwadar and Karachi to China's Xinjiang province and beyond by overland routes.



## 8.4 Shahpurkandi Dam Project

### Why in news?

As the Shahpurkandi barrage on the river Ravi in the Indian state of Punjab nears completion, there are fears in downstream Pakistan regarding the restriction of water flow.

### River Ravi

- **Location** - Ravi is a *trans-border river* that flows through India and Pakistan.
- It is one of the *5 tributaries of the Indus River* that gives the Punjab region its name and identity.
- **Origin** - In the Himalayas within Himachal Pradesh
- **Length** – Has a total length of 720 km, of which 320 km are in India and 400 km are in Pakistan.
- **Other names** - Iravati, Hydraotes, Parushani, The river of Lahore (since Lahore is situated on its eastern bank).
- **Tributaries** - Seul, Saiwa, Nai, Ujh, Budhil, etc.
- **Dams and barrages built on Ravi** - Ranjit Sagar Dam, Chamera Dam, Madhopur Headworks, Sidhnaï Barrage and Shahpur Kandi barrage
- **Historical significance** - The *Battle of the Ten Kings* was fought on the banks of the Ravi River, which was then called Parushani.
- **Religious significance** - Guru Nanak, the founder of Sikhism, was believed to be born on its banks in the village of Rai Bhoi di Talwandi, now known as *Nankana Sahib*.
- The Hindus believe that it as one of the *Sapta Sindhu*, or the seven holy rivers of India.

### What is the project about?

- **Location** - It is a 55.5-metre-high dam constructed on the **river Ravi**.
- It is located downstream of *Ranjit Sagar dam* and upstream of *Madhopur barrage* in Punjab, India.
- **Project** - It is a part of the Rs 3,300 crore Shahpurkandi multipurpose river valley project, which also comprises two hydropower plants with an installed capacity of 206 MW.
- **Year** - 1<sup>st</sup> ideated in 1979 between Punjab and Jammu and Kashmir and was declared a national project in 2008.
- **Implemented by** – Punjab
- **Objective** – To minimise some of the water of Ravi that is currently going waste through the Madhopur barrage downstream to Pakistan.



### How significant is Shahpurakandi Dam Project to India?

- **Irrigation** - It will facilitate irrigation of 5,000 hectares in Punjab and over 32,000 hectares in Jammu and Kashmir.
- **Power** - J&K will get 20% share of power and Punjab will get 80%.
- **Full utilization of river** - It will also check uncontrolled flow of water (approximately 2 MAF) to Pakistan.
- **Boosts defence potential** - Regulated water supply in canals will also bolster defence potential of the vulnerable *Kathua-Samba corridor*.
- **Ensures water supply** - Balancing the reservoir will also optimise water supply to *Upper Bari Doab Canal*, which was erratic and dictated by power generation considerations.

- The earlier, tedious method of lifting water into **Tawi Lift Canal** will get simplified with gravity feed.

### How is the usage of Ravi river water regulated?

- **Indus Waters Treaty (IWT)** administers how river Indus and its tributaries that flow in India and Pakistan will be utilised.
- The IWT is one of only two major transboundary water treaties in South Asia (the other being the 1996 Ganges treaty).
- Signed in **1960** between between India and Pakistan.
- It was brokered by the **World Bank**.

*India, with the lowest per-capita freshwater availability, has barely 4% freshwater reserves for 17% of the world's population.*

Rights of water usage		
River segment	India's rights	Pakistan's rights
<b>Eastern Rivers</b> - Sutlej, Beas and Ravi	Unrestricted use over the Eastern Rivers	-
<b>Western rivers</b> - Indus, Chenab and Jhelum	Obligation to let flow the western rivers unrestricted. However, since Indus flows from India, it is allowed to use 20% of its water for <ul style="list-style-type: none"> <li>• Irrigation</li> <li>• Power generation</li> <li>• Transport purposes</li> </ul>	Unrestricted use of the Western rivers.

- **Rights of water usage** - Both India and Pakistan have the **right to non-consumptive use** and rights of drainage issues and river conservation aspects.
- Pakistan also has the right to object to the design of the Indian projects.
- India is currently utilising around 94-95% of its share of water in the eastern rivers through a network of dams, including the **Bhakra** on Sutlej, **Ranjit Sagar** on Ravi, and **Pong and Pandoh** on Beas.

*Shahpur Kandi dam project, a proposed multipurpose project on the Ujh river in J&K and the 2<sup>nd</sup> Sutlej-Beas link project in Punjab are the 3 key projects of India to utilise the water guaranteed under the IWT.*

### What is the issue over water sharing?

- Since signing the treaty, one of India's biggest grievances has been that does not allow it to build storage systems on the western rivers.
- According to the treaty, such systems can be built under exceptional circumstances but India complains that any such attempts are blocked by Pakistan.
- In 2023, India had issued a notice to Pakistan for the modification of the Indus Waters Treaty (IWT).

*China is building Yarlung-Zangbo dam on Tsangpo (Brahmaputra) with plans to build a 1,100-km long channel to Takaltaman desert.*

## G.S PAPER III

### 9. ECONOMY

#### 9.1 90 Years of RBI

#### Why in news?

The Reserve Bank of India (RBI) recently celebrated its 90<sup>th</sup> year in Mumbai.

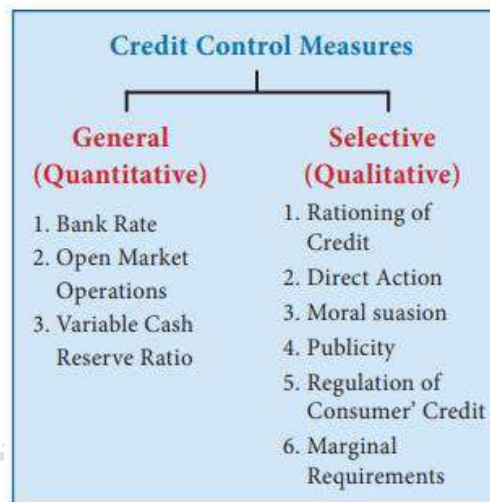
#### What is the history of RBI?

- **About-** RBI is India's central banking institution, which controls the monetary policy of the Indian rupee.

- **Hilton Young Commission**-RBI was set up based on the recommendations of the Royal Commission on Indian Currency and Finance, which was appointed by Lord Reading, then viceroy of India.
- **Established year**- April 1, 1935 in accordance with RBI Act, 1935.
- **Headquarters**- It is moved from Calcutta to Mumbai in 1937.
- **Nationalisation**- The bank was nationalised (fully owned by government) in 1949.

**What are the functions of RBI?**

- **Monetary authority**- It controls the supply of money in the economy to stabilize exchange rate, maintain healthy balance of payment, attain financial stability, control inflation, and strengthen banking system.
- **Issuer of currency**- RBI is the sole authority to issue currency, it also takes action to control the circulation of fake currency.
- **Issuer of banking license**-As per Section 22 of Banking Regulation Act, 1949 every bank has to obtain a banking license from RBI to conduct banking business in India.
- **Banker to the government**- It acts as banker to both the Central and the State governments, by providing short term credit and advises the government on banking and financial subject
- **Banker's Bank**- RBI is the bank of all banks in India as it provides loan to banks, accept the deposit of banks, and rediscount the bills of banks.
- **Lender of last resort**- The banks can borrow from the RBI by keeping eligible securities as collateral at the time of need or crisis, when there is no other source.
- **Act as clearing house**- For settlement of banking transactions, RBI manages 14 clearing houses. It facilitates the exchange of instruments and processing of payment instructions.
- **Custodian of foreign exchange reserves**- Manages foreign exchange reserves, administers Foreign Exchange Management Act (FEMA), and maintains exchange rate stability.
- **Regulator of economy**- It controls the money supply in the system, monitors different key indicators like GDP, Inflation, etc.,
- **Regulator and supervisor of Payment and Settlement Systems**- The Payment and Settlement Systems Act of 2007 (PSS Act) gives RBI oversight authority for the payment and settlement systems in the country.
- **Developmental role**- RBI promotes development of quality banking system, ensures credit availability to productive sectors, establishes financial infrastructure, expand access to financial services and promotes financial literacy.
- **Exchange manager and controller**- Represents India in international monetary organizations like IMF, authorizes commercial banks as dealers.
- **Banking Ombudsman Scheme**- RBI introduced the scheme in 1995 to address complaints against banks, allows complainants to file grievances and appeal decisions.
- **Banking Codes and Standards Board of India (BCBSI)** - To measure the performance of banks against Codes and standards based on established global practices, the RBI has set up the BCSBI.



Major contributions of RBI	
Initiatives	About
<b>Green Revolution Package (1960s-1970s)</b>	It played a pivotal role in supporting this initiative by providing credit facilities to farmers, promoting agricultural mechanisation, and implementing policies to enhance rural credit accessibility.
<b>Nationalization of banks, 1969</b>	It was implemented under the Banking Companies (Acquisition and Transfer of Undertakings) Act of 1970, to better serve the needs of development of the economy in conformity with national policy objectives.

<b>Priority Sector Lending, 1972</b>	It provides timely and sufficient credit to key sectors of the economy that might otherwise face difficulties in accessing funds
<b>Liberalization of Indian economy, 1991</b>	It refers to the series of policy changes aimed at opening up the country's economy to the world, with the objective of making it more market-oriented and consumption-driven.
<b>TReDS, 2014</b>	It is an electronic platform where MSMEs can sell their receivables at a competitive rate to financiers, including banks and non-banking financial companies (NBFCs), through an auction mechanism.
<b>Unified Payment Interface (UPI), 2016</b>	It was launched by the National Payments Corporation of India (NPCI) to provide seamless and instant experience to users across India.
<b>Inflation Targeting Framework, 2016</b>	Under this framework, the RBI set a target for inflation and adjusted monetary policy instruments to achieve it, the banking regulator has set an inflation target of 4%, with a tolerance band of +/- 2%.
<b>Bharat Bill Payment System (BBPS), 2019</b>	It was launched by NPCI, which is an integrated bill payment system that offers interoperable and accessible bill payment services to customers through a network of agents or online channels.
<b>Aadhar-based eKYC, 2019</b>	The Aadhaar eKYC process enables financial institutions to authenticate customers' identities remotely, without the need for physical documentation.
<b>Emergency Credit Line Guarantee Scheme (ECLGS), 2020</b>	To provide immediate credit assistance to small and medium enterprises (SMEs) affected by the COVID-19 pandemic.
<b>Account Aggregator, 2021</b>	The framework allows customers to manage their financial data from various financial entities in a secure and seamless manner through a consent-based mechanism.

### What are the challenges of RBI?

- **Global financial crises-** RBI has had to navigate through various global financial crises, such as the Asian financial crisis (late 1990s) and the global financial crisis of 2008 which posed challenges to India's financial stability and required coordinated policy responses from the RBI and other authorities.
- **Domestic disruptions-** During demonetization in 2016 certain currency notes were invalidated overnight which presented significant logistical and economic challenges.
- **COVID-19 pandemic-** RBI implemented various measures to support the economy, such as liquidity injections, regulatory relaxations, and interest rate cuts, to mitigate the economic impact of the pandemic.
- **Bad loans-** Non-Performing Assets (NPAs) or bad loans have been a persistent challenge for the Indian banking sector, RBI has implemented measures to address this issue, including asset quality reviews, prompt corrective action frameworks, and resolution mechanisms like the Insolvency and Bankruptcy Code (IBC).
- **Inflation management-** India has experienced periods of high inflation, RBI implemented monetary policy measures to manage inflation.
- **Crypto regulations-** Despite a Supreme Court ruling overturning the RBI's ban on cryptocurrency trading, regulatory clarity on crypto remains ambiguous

## 9.2 RBI's Surge in Gold Reserves

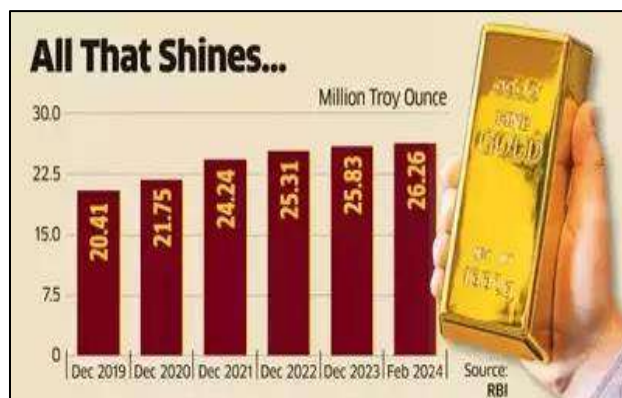
### Why in news?

RBI has increased gold purchases to diversify reserves, with gold value contributing to a 3 billion dollars rise in forex reserves to 648.5 billion dollars.

### What is the status of RBI's gold reserves?

- The Reserve Bank of India has increased its gold purchases, significantly boosting its foreign exchange reserves with 3 billion dollar rise reaching a record 648.5 billion dollars.

- The RBI has bought approximately 13.3 tonnes of gold (between January-February 2024), accounting over 80% of its total purchases in 2023.
- RBI has consistently buying gold since 2017 to diversify its foreign currency assets and hedge against inflation and forex risks.
- The proportion of gold in India's total foreign exchange reserves has increased from around 7.9% in early April 2023 to approximately 8.41% in early April 2024. But it's important to note that the central bank holds only a portion of these reserves domestically.
- A significant portion is held abroad, with custody arrangements in institutions such as the Bank of England and the Bank of International Settlements (BIS).



### Why RBI is buying gold?

- **Safe haven asset-** Gold is traditionally viewed as a safe haven asset during times of economic and political instability, gold's intrinsic value and status as a globally recognized store of wealth contribute to its appeal as a reserve asset.
- **Russia-Ukraine conflict-** Heightened uncertainty in the global geopolitical landscape has diminished US dollar as stable currency, this underscores the importance of diversification and risk management in reserve management strategies.
- **Surge in gold price-** The surge in international gold prices has bolstered the value of the Reserve Bank of India's (RBI) gold reserves as this increase in value reflects both the quantity of gold held by the RBI and the prevailing market price of gold.
- **Volatility in Forex market-** Gold historically has served economic uncertainty, geopolitical tension etc., compared to currencies hence gold is perceived as more stable stores of value.
- **Raising interest rate in US-** When interest rate rise in the United States, it can affect global financial market as they reduce liquidity in emerging markets and increase borrowing costs. Hence central banks diversify their reserve assets, including their holding of gold to hedge against potential adverse effects of rising US interest rates.
- **Diversify asset classes-** Gold offers diversification benefits because its price movements often behave differently from those of other asset classes, such as equities or bonds.
- **Global economic shifts-** The move reflects a broader trend of declining confidence in dollar assets among central banks, with a noticeable drop in US treasury bond holdings from 50.1% to 47.2%.
- **Weakened dollar-** Currently, US bonds are at their highest yields, indicating a weakened dollar compared to its past strength, despite being the dominant currency in global trade.

The RBI's gold reserves are typically valued based on prices quoted on the London Bullion Market Association (LBMA), one of the world's leading precious metals markets.

RBI aims to diversify its reserves with gold accounting for about 8.41% of total foreign exchange reserves in value as of early April 2024.

### Foreign Exchange Reserve

- **About-** Forex reserves are assets maintained by *monetary authorities* to check the balance of payments, deal with the foreign exchange rate of currency and to maintain financial market stability.
- **Governed by-** RBI Act, 1934 and the Foreign Exchange Management Act, 1999.
- **Composition-** India's forex reserves can be broken into four categories.
  - Foreign currency assets
  - Gold
  - Special drawing rights
  - IMF's Reserve Tranche Position

### Why gold is an important component in foreign exchange reserve?

- **Commodity-linked currencies** - Gold has performed even better when expressed in terms of commodity-linked currencies.
- **Increasing value of gold** - The rate of the gold has been increasing more than the US dollar.
- **Weak global financial system** - The financial system is expected to face several crisis because of more volatility.
- **Foundation for the rupee** - Gold reserves coupled with a strong economy, balanced current account deficit and good balance of payment lay the foundation for the rupee in long term.

### What lies ahead?

- RBI by maintaining a diversified reserve portfolio that includes gold alongside other assets, aims to enhance the stability and resilience of their reserves, ultimately supporting their broader monetary and financial stability objectives.
- RBI can reduce exposure to any single asset class or currency due to diversified reserves, this strategy helps safeguard reserves against volatility, economic shocks, and geopolitical uncertainties.

### Bank of International Settlements (BIS)

- **Established year**- 1930.
- **Ownership**- It is owned by 63 central banks including RBI that account for 95% of the GDP.
- **Head office**- Basel, Switzerland.
- **Representative offices**- Hong Kong and Mexico City.
- **Mission**- To support central banks pursuit of monetary and financial stability through international cooperation and to act as bank for central banks.
- **Basel Committee on Banking Supervision**- It provides the Basel norms.

## 9.3 Global Financial Stability Report 2024

### Why in news?

Recently International Monetary Fund has released Global Financial Stability Report 2024

### Global Financial Stability Report 2024

- **Released by**- International Monetary Fund
- **Publication**- *Semi-annual* (Twice per year in April and October)
- **Theme**- The Last Mile: Financial Vulnerabilities and Risks.
- **About**- It provides an assessment of the global financial system and markets, and addresses emerging market financing in a global context.
- **Focus**- The report focuses on current market conditions, highlighting systemic issues that could pose a risk to financial stability and sustained market access by emerging market borrowers.
- **Frequent assessment**- It replaced two previous reports by the IMF, the annual International Capital Markets Report and the quarterly Emerging Market Financing Report.
- **World Economic Outlook**- The Report draws out the financial ramifications of economic imbalances highlighted by the IMF's World Economic Outlook.
- **Chapters**-
  - High Inflation
  - Unregulated credit market
  - Cyber-attack on financial institutions

## What are the key highlights of the report?

Issues	Recommendations
<ul style="list-style-type: none"> <li>• <b>Investor optimism-</b> The report warns the investor optimism about the end of <i>high inflation and potential interest rate cuts</i> by central banks may be premature as inflation has stalled in some economies.</li> <li>• <b>Geopolitical risks-</b> Ongoing conflicts in <i>West Asia and Ukraine</i> could disrupt supply and keep prices high, preventing central banks from reducing rates soon.</li> <li>• <b>Market correction risks-</b> If central banks do not act as investors expect, there could be a significant market correction, resulting in <i>substantial losses</i> for those who have invested in anticipation of rate cuts.</li> </ul>	<ul style="list-style-type: none"> <li>• Central banks should avoid easing monetary policy prematurely and push back against overly optimistic market expectations for rate cuts.</li> <li>• In jurisdictions displaying ample evidence of inflation moving towards target, policy should gradually move to a more neutral stance.</li> <li>• Emerging and frontier economies should strengthen efforts to contain debt vulnerabilities.</li> <li>• Regulatory authorities should use supervisory tools to ensure that banks and NBFCs are resilient to the credit cycle downturn.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Private credit market-</b> The IMF is concerned about 2.1 trillion dollars unregulated private credit market where non-bank financial institutions lend to corporate borrowers, potentially affecting the broader financial system.</li> <li>• <b>Higher returns-</b> The investors are drawn to the private credit market due to the potential for higher returns compared to traditional investments.</li> <li>• <b>Concerns of financial soundness-</b> The IMF is concerned that many borrowers in the private credit market may not be financially robust, with some unable to cover even their interest costs.</li> <li>• <b>Benefits borrowers-</b> Borrowers who may not have access to <i>long-term funds</i> through conventional channels find opportunities in the private credit market.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider a more proactive supervisory and regulatory approach.</li> <li>• Close data gaps and enhance reporting requirements to comprehensively assess risks.</li> <li>• Strengthen cross-sectoral and cross-border regulatory cooperation</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Cyber risks-</b> With growing digitalization, evolving technologies, and increasing geopolitical tensions, cyber incidents— especially those with malicious intent—are a rising concern for macro financial stability.</li> <li>• <b>Economic loss-</b> Although most losses from cyberattacks are modest, the risk of extreme losses has been increasing.</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthen response and recovery procedures to boost resilience against cyber incidents.</li> <li>• Enhance data reporting and information sharing.</li> <li>• Develop national cybersecurity strategies and effective regulation and supervisory frameworks</li> </ul>

## What does it mean for India?

- **Foreign capital flows-** Emerging markets, including India, have experienced strong fund flows due to optimism surrounding central banks easing interest rates, but this could change rapidly if western central banks signal their intention to maintain high interest rates for an extended period.
- **Risk of capital outflow-** If investors perceive that interest rates will remain elevated in western economies, they may withdraw money from emerging markets like India this would exert pressure on Indian currency leading to further depreciation of Indian rupee.
- **Rupee depreciation-** The Indian rupee has already been depreciating, trading at a new low of 83.57 against the U.S. dollar recently. Despite likely intervention by RBI, external factors continue to impact the rupee's value.
- **Effects on the financial system-** A severe outflow of capital could have consequences on India's financial stability, the RBI may need to take measures such as curbing liquidity or raising interest rates.
- **India's private credit market-** India has seen the emergence of a small but growing private credit market with the rise of [Alternative Investment Funds](#) (AIFs).
- **Regulatory scrutiny-** Both the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI) have increased their scrutiny over these funds to ensure financial stability.

*In 2023, India ranked as the second-largest recipient of foreign capital after the U.S.*

*Investments through AIFs in India have more than tripled from 2018 to 2022-23.*

## 9.4 Drop in Private Investments

### Why in news?

The decline of private investment, indicated by the Gross Fixed Capital Formation has been a concern for the Indian economy since 2011-12.

### Status of private investment in India

- Private investment in India began to significantly pick up after the economic reforms of the late 1980s and early 1990s, which improved private sector confidence.
- **Pre-Liberalization era-** Prior to economic liberalization, private investment remained either slightly *below or above 10% of GDP*.
- **Post-Liberalization-** After liberalization, private investment took on the leading role in fixed capital formation.
- **Public investment-** Public investment as a percentage of GDP steadily rose over the decades, from less than 3% of GDP in 1950-51 to eventually overtake private investment in the early 1980s.
- **Global financial crisis-** The growth in private investment continued until the global financial crisis of 2007-08, during which it rose to around 27% of GDP.
- **Current status-** From 2011-12, private investment began to decline and hit 19.6% of GDP in 2020-21.
- **Recent Trends-** However, from 2011-12 onwards, private investment began to decline and hit a low of 19.6% of GDP in 2020-21.

### Why there is a need of private investment for an economy?

- **Multiplier effect-** Private investments create both *direct and indirect employment opportunities*, stimulate consumption, and contribute to overall development.
- **Effective collaboration-** Faster development can be achieved when the *public and private sector collaborate* effectively, especially in critical areas such as infrastructure and long term investments.
- **Essential development-** India has established public-private partnerships to *channel private sector funds* effectively, it is crucial for directing investments into essential development areas like airports, industrial parks, higher education, and skill development.
- **Long term growth-** Countries with higher private investment tend to experience *greater rates of growth* over the long term. To boost economic growth and welfare, it's essential to implement public policies that encourage sustained increases in private investment rates.
- **Foster innovation-** The investments are driven by *competition*, contribute to economic progress and technological advancement by enhancing efficiency, output, and innovation.
- **Environment efficiency-** It is crucial for both *ecological conservation* and economic growth, with resources like cash, budgets, communication systems, and infrastructure playing a significant role.

### Gross Fixed Capital Formation

- It is the spending towards investments in boosting the *productive capacity* of the economy which typically accounts for 30% of the GDP.
- It is used as an indicator of the level and quality of investment in a country, its competitiveness & innovation.
- GFCF refers to the growth in the *size of fixed capital* within an economy. Fixed capital includes assets like buildings and machinery, which are essential for production and require investment to be created.
- *Private GFCF* serves as a rough indicator of how much the private sector in an economy is willing to invest. It reflects the private sector's commitment to expanding its productive capacity.
- *Overall GFCF* also includes capital formation resulting from government investment. Government spending on infrastructure, education, and other areas contributes to the overall fixed capital base.
- Fixed capital plays a crucial role in boosting economic growth. By enabling workers to produce more goods and services each year, it improves living standards.
- Developed economies possess more fixed capital per capita than developing economies such as India.

### Why private investment has fallen?

- **Low private consumption**- It is the key reason for the lack of growth in private investment, especially since the pandemic as robust consumption is necessary to assure businesses of demand for their products, which would encourage investment in fixed capital.
- **Challenges in financial sector**- Issues in financial sector such as *non-performing assets (NPAs)* in banks and liquidity constraints can hinder private investments.
- **Reluctance of bank**- They resist to lend to businesses, *especially small and medium enterprises (SMEs)* can restrict access to capital needed for investment.
- **Infrastructure deficit**- The cost and risk of investment is increased due to unreliable power supply, poor transportation networks and bureaucratic delays in obtaining permits which limits efficiency and competitiveness of businesses.
- **Global economic factors**- Economic downturns or slowdowns in major global economies can impact investor sentiment and lead to reduced investment flows into emerging markets like India.
- **Policy inertia**- Delays or lack of progress in implementing structural reforms and policy initiatives aimed at improving the business environment, *enhancing ease of doing business*, and attracting investment can contribute to declining private investment.

### What are the consequences of low private investment?

- **Slower economic growth**- When private investment remains low, it hampers the expansion of the fixed capital base. This, in turn, leads to slower economic growth.
- **Crowding out effect**- It is a scenario where the increased government spending ultimately decreases private sector spending.
- **Impact on capital allocation**- Private investors are often considered better allocators of capital than public officials as they are driven by profit motives, hence if low private investment this could mean less efficient capital allocation.
- **High taxation**- If private investment is low, the government may need to raise taxes to make up for the investment shortfall, which can further slow economic growth.
- **Financial instability**- Low levels of private investment can be associated with greater instability, increasing the risk of firms going bankrupt or experiencing slower growth.
- **Impact on Infrastructure**- It can lead to a decline in private capital, which might affect wages and productivity.

### What lies ahead?

- The government should increase consumption by transferring more money to the people, which could, in turn, stimulate private investment.
- A healthy balance between private and government investment is crucial for sustainable economic growth.
- Private investments is crucial as it is profit driven hence encourages efficient resourceful utilization and help avoid wasteful spending.

## 4.7 Asset Attachments by ED

### Why in news?

Prime Minister Modi is considering legal options to return nearly Rs 3000 crore seized by the Enforcement Directorate to the people of West Bengal.

#### Enforcement Directorate (ED)

- **About**- It is a premier financial investigation agency and economic law enforcement agency of the Government of India. **Headquarters** - New Delhi
- **Ministry**- Department of Revenue, Ministry of Finance.
- The ED currently draws its statutory powers from 3 different acts
  - Foreign Exchange Management Act, 1999 (FEMA)

- [Prevention of Money Laundering Act, 2002 \(PMLA\)](#)
- Fugitive Economic Offenders Act, 2018 (FEOA)
- **Director** - Director is the head of the Enforcement Directorate assisted by special directors.
- The [director](#) is appointed in accordance with the provisions of the [Central Vigilance Commission Act 2003](#).
- The Centre appoints the director on recommendation of a high-level committee headed by the Central Vigilance Commissioner.
- **Tenure**- The director has a fixed tenure of 2 years and a maximum 3 annual extensions.

### How are seizures made?

- **Enforcement Directorate**- It is responsible for handling cash and other assets it seizes or attaches during investigations under Prevention of Money Laundering Act (PMLA).
- **Conduct search**- ED conducts searches at the premises of suspects with a search warrant under PMLA.
- **Seizure**- Any cash or assets recovered during these searches are seized in the presence of independent witnesses who sign a seizure memo.

Seizures	Prior to 2018	System rationalised in 2018
<b>Seized cash</b>	<ul style="list-style-type: none"> <li>● It was deposited into fixed deposit accounts opened by the concerned administrative zones.</li> <li>● The money remained in the account until the case was decided.                             <ul style="list-style-type: none"> <li>○ <b>If convicted</b>- The cash attached would be deposited in the government treasury.</li> <li>○ <b>If acquitted</b>- The entire amount along with interest would be returned to the accused.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● The money gets deposited directly in the treasury through personal deposit accounts.</li> <li>● The concerned zones now open PD accounts in the name of Enforcement Directorate with State Bank of India.</li> <li>● These accounts do not generate any interest on deposits.</li> </ul>
<b>Seized gold or other valuables</b>	It would be deposited in a locker.	<ul style="list-style-type: none"> <li>● The rest of the procedure for both gold and cash remains the same.</li> </ul>

### What happens after seizure or attachment?

- **Purpose of attachment**- To deprive the accused of the benefits associated with the attached asset, the law ensures that the property remains off-limits to the accused until the trial is complete.
- **Confirmation from adjudicating authority**- After the seizure, ED has 180 days to obtain confirmation from the adjudicating authority regarding the seizure.
- Once the attachment is confirmed, the ED gains the right to take possession of the seized property.
- **Appeal**- The Adjudicating Authority's order can be challenged in [PMLA Appellate Tribunal](#) and subsequently in the [high court](#) which may either stay the order, restore the property to the owner, or allow ED's possession.

### How ED is handling various attachments?

Attachments by ED	Handling of ED attachments
<b>Unused properties</b>	<ul style="list-style-type: none"> <li>● Some properties may have limited utility for the agency or other government departments while the trial is ongoing.</li> <li>● In such cases, the special director of the ED becomes the custodian and administrator of the property.</li> <li>● After the trial concludes, the government may auction these properties, but they may deteriorated due to lack of maintenance as the properties left unused for extended periods.</li> </ul>
<b>Immovable property</b>	<ul style="list-style-type: none"> <li>● In the case of immovable property (such as land or buildings), the ED can issue an eviction notice to the property owner.</li> <li>● Upon compliance, the ED assumes physical possession of the property</li> </ul>

<b>Running businesses</b>	<ul style="list-style-type: none"> <li>• As a rule, running businesses are not shutdown following the confirmation by adjudicating authority.</li> <li>• If the accused does not receive legal protection from the tribunal or the high court, the ED has the authority to claim all profits generated from the operation of commercial premises (e.g., hotels).</li> <li>• These profits are deposited into PD accounts of the agency.</li> <li>• If the accused is acquitted, the entire amount is returned to them.</li> </ul>
<b>Residences</b>	<ul style="list-style-type: none"> <li>• If a residence is attached by the ED and the attachment is confirmed by judicial authorities, the agency gains the right to seek eviction of the accused from the premises.</li> <li>• However, if the accused is unable to move out, the ED has an alternative of seeking rent from the accused.</li> </ul>
<b>Vehicles</b>	<ul style="list-style-type: none"> <li>• Earlier the attached vehicles were sent to warehouses owned by the <b>Central Warehousing Corporation</b>.</li> <li>• Unfortunately the case dragged for years, at the end of the trial neither the accused nor ED could recover anything substantial from the vehicle.</li> <li>• To address the issue, the rules were recently amended which allows the ED to use the attached vehicle during the trial, the ED still seeks rent fixed by the local transport department.</li> </ul>

## 10. AGRICULTURE

### 10.1 Need of Agroforestry

#### Why in news?

Agroforestry has gained popularity after decades of mono-cropping inspired by Green Revolution as it enhances farmer livelihoods and benefits the environment.

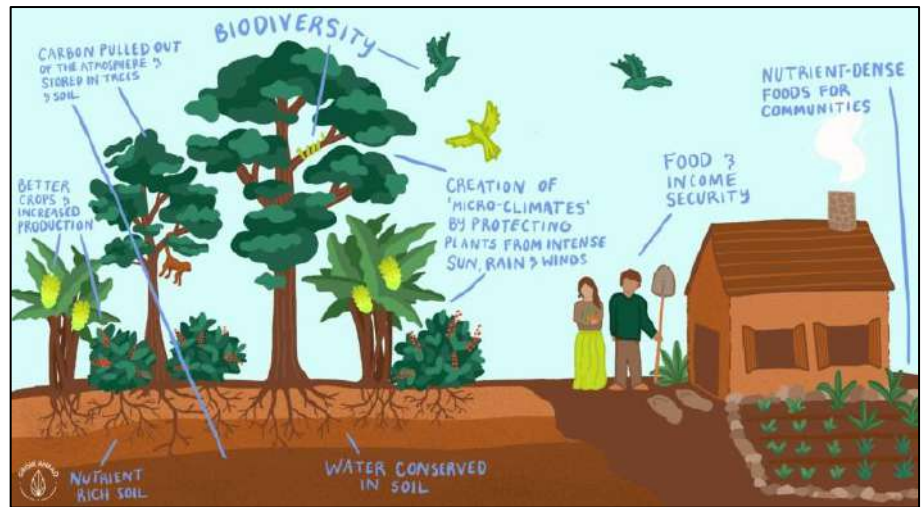
#### What are the features of agroforestry?

- **Integration of trees and shrubs**- It is a comprehensive land use system that goes beyond traditional agriculture by integrating trees and shrubs into farmlands and rural landscapes.
- **Enhanced productivity**- It *diversifies agricultural production* by incorporating trees and shrubs alongside traditional crops and livestock that can lead to increased yields and overall productivity of the land.
- **Improved profitability**- It can provide *additional source of income* for farmers through products such as fruits, nuts, timber, and medicinal plants hence contribute to greater economic stability and resilience for farming communities.
- **Increased diversity**- It can *promote biodiversity* by creating habitats for various plant and animal species that not only supports ecosystem health but also provides ecological services such as pollination and pest control.
- **Sustainability**- By mimicking natural ecosystems, agroforestry enhances the sustainability of agricultural practices. Trees help to conserve soil, improve water retention, and *mitigate the impacts of climate change* by sequestering carbon.
- **Resilience**- Agroforestry systems are adaptable and *responsive to ecological conditions*, allowing farmers to adjust their practices based on factors like soil type, climate, and landscape characteristics.
- **Built social institutions**- It encourages *community participation* and cooperation in natural resource management. It can foster social cohesion and empower local communities to collectively manage their landscapes for mutual benefit.

*Agroforestry is the interaction of agriculture and trees, including the agricultural use of trees.*

## Why there is a need of agroforestry?

- **Weather induced changes-** Challenges like the *Gaja cyclone*-induced damage prompted farmers in Tamil Nadu to transit agroforestry by planting trees like jackfruit and mangoes, leading to increased profits.
- **Diverse agro climatic zones-** Agroforestry provides a flexible and adaptable approach that can be tailored to suit the specific needs and conditions of different regions, from the humid tropics to the arid deserts.



- **Climate resilience-** Indian agriculture faces increasing incidences of *extreme weather events* such as droughts, flood and cyclone, agroforestry can built resilience against such shocks by providing buffers and diversifying income sources for farmers.
- **Enhance small landholders-** The majority of farmers in India are small landholders who depend on agriculture for their livelihood, agroforestry offers them opportunities to improve their income and food security through diversified production systems that include crops, trees, and livestock.
- **Water management-** Agroforestry-based watershed management can help conserve water, recharge aquifers, and improve water-use efficiency in agriculture as erratic rainfall patterns and overexploitation of groundwater resources is a cause of concern for India.
- **Biodiversity conservation-** India is one of the world's biodiversity hotspots, it promotes biodiversity conservation by providing habitats for native species preserving genetic diversity and restoring degraded ecosystems.
- **Rural development-** It can contribute to rural development by generating employment opportunities, fostering entrepreneurship, and revitalizing local economies.
- **Food security-** It can integrate food crops with fruit and nut trees can contribute to diversified diets and improved nutrition outcomes, thereby enhancing food security at the household and community levels.

## Steps taken by India to promote agroforestry

- **Sub-Mission on Agroforestry-** It was launched in 2016-17 to encourage tree plantation on farm land alongside crops/cropping systems under the scheme "Har Medh Par Ped".
- **National Agroforestry Policy-** It was launched in 2014 that aims to support and expand agroforestry practices.
- **Trees Outside of Forests India-** It is a joint initiative by USAID and India's Ministry of Environment to increase tree covers in 7 states (Andhra Pradesh, Assam, Haryana, Odisha, Rajasthan, Tamil Nadu, and Uttar Pradesh) to expanding the area under trees outside forests for the benefit of livelihoods and the ecosystem.
- **AICRP-** All India Coordinated Research Project on Agroforestry (AICRP) was established to conduct systematic research on tree-crop interactions.
- **Greening and Restoration of Wasteland (GROW) with Agroforestry-** It is a NITI Aayog initiative that focuses on using agroforestry for greening wastelands and carbon sequestration.
- **Indian Forest and Wood Certification Scheme-** It was launched in 2023 by Ministry of Environment, Forest and Climate Change to promote sustainable management of forests and agroforestry.

## What lies ahead?

- There is a need of tools like *Jaltol* which is an open source water accounting tool that helps assess water needs for different tree-crop combinations, enabling informed decision making in water stressed region.
- The need of the hour is to choose native species that is crucial for sustainability, tools like Diversity for Restoration aid in selecting climate-resilient species.

- Potential incentive mechanisms such as payment of ecosystem services would strengthen the ideology of nature-centred economics.
- There is a need to ensure economic viability through market linkages while meeting the criteria of sustainable agroforestry which is crucial to empower small land holders.
- Agroforestry presents a potential solution to foster healthy ecosystems and resilient livelihoods in India requiring collaboration among conservationists, agro-economists, and policymakers.

## 11. ENVIRONMENT

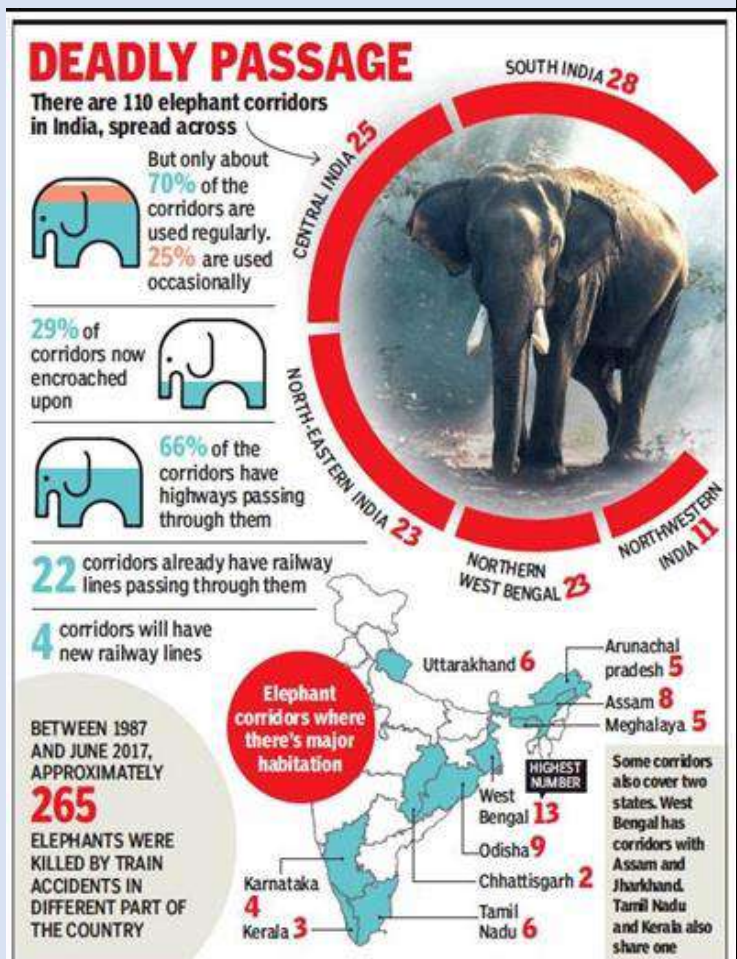
### 11.1 Elephant Corridors in India

#### Why in news?

The Ministry of Environment Forest and Climate Change recently directed Arunachal Pradesh and Assam to prepare a proposal to notify the Dulung-Subansiri elephant corridor.

#### Status of elephants

- Elephants are the natural heritage animal of India, elephant calves are able to walk within 1 or 2 hours of birth.
- The *Asian elephant* is the largest mammal living on the land of Asia.
- **Scientific name** - *Elephas maximus*
- **Gestation period** - 22 months
- **IUCN Red List** – Endangered
- **Wildlife Protection Act 1972** - Schedule I
- **CITES** - Appendix I
- **Population** - There are about 50,000-60,000 Asian elephants in the world.
- **Elephant reserves**- There are 33 elephant reserves in India, latest being Terai Elephant Reserve in Uttar Pradesh.
- **Elephant corridors**- About 101 elephant corridors have been identified in the country which need to be secured for conservation of elephants.
- **West Bengal**- It has the highest number of identified elephant corridors in India, accounting for over 17% of all the reported elephant corridors in the country.
- **World elephant day**- It is an international annual event, celebrated on **12th of August** every year.
- **Status of elephants**- More than 60% of the world's elephant population is in India., Karnataka has the highest number of elephants (6,049), followed by Assam (5,719) and Kerala (3,054).



#### How elephant corridor is designated in India?

- Elephant corridor is that it is a strip of land that facilitates the movement of elephants between two or more viable habitat patches.
- **Wildlife Protection Act, 1972**- It empowers the state governments to declare areas that link protected regions as “conservation reserves” under *Section 36A*.

- **Community reserves-** It can also be designated as “community reserves” according to Section 36C of the wildlife protection act, 1972.
- **Role of ministry-** The Ministry of Environment, Forest and Climate Change collaborates with state forest departments to identify and validate elephant corridors.
- **State level designation-** State governments play a crucial role in demarcating and designating these corridors as “ State Elephant Corridors”.
- **Legal protection-** These designations subject the corridors to legal protection under relevant laws, such as the Wild Life (Protection) Act, 1972, and the Environment Protection Act, 1986.
- **National Elephant Corridor Project-** It aims to ensure and manage these vital pathways for elephant movement, this project identifies and conserves corridors to ensure the long term survival of Asian elephants within India’s political boundaries.

**Why India needs elephant corridor?**

- **Legal protection-** The corridors will legally protected, potentially designating it as a wildlife sanctuary or conservation reserve.
- **Reduce habit isolation-**It allow elephants to continue their nomadic mode of survival, despite shrinking forest cover, by facilitating travel between distinct forest habitats.
- **Keystone species-** Supreme Court in elephant corridor case said that its State’s duty to protect a “keystone species” like elephants, which are immensely important to the environment.
- **Forest conservation-** Animal paths are blocked as forests have been turned into farms and unchecked tourism, these elephant corridors would check the negative impacts on wildlife habitats and migration routes.
- **Man-animal conflict-** Animals are forced to seek alternative routes resulting in increased [elephant-human conflict](#), these particularly affect animals that have large homes like elephants, a dedicated elephant corridor would reduce the fatalities.
- **Forest regeneration-** They would help regenerate forests on which other species, including tigers depend.
- **Preserve migratory corridors-** The negative impacts of forest fragmentation on ecosystems highlight the necessity of preserving and restoring migratory corridors to mitigate these effects.
- **Hydropeaking risks-** Worldwide Institute of India report highlighted the dangers of hydropeaking in lower Subansiri hydroelectric project which could lead to flash floods and pose threat to elephants, particularly calves.

*Kerala is the first state to declares man-animal conflict as a state-specific disaster.*

*Supreme Court upheld the Tamil Nadu government’s authority to notify an ‘elephant corridor’ and protect the migratory path of the animals through the Nilgiri biosphere reserve.*

Project elephant	Monitoring of Illegal Killing of Elephants (MIKE)
<ul style="list-style-type: none"> <li>• <b>Launch year-</b> In 1992 as a Centrally Sponsored Scheme.</li> <li>• <b>Objectives</b> <ul style="list-style-type: none"> <li>○ To protect elephants, their habitat and corridors</li> <li>○ To address issues of man-animal conflict</li> <li>○ Welfare of captive elephants</li> </ul> </li> <li>• <b>Ministry -</b> Ministry of Environment, Forest and Climate Change provides financial and technical support to major elephant range states in the country.</li> <li>• <b>MIKE-</b> Monitoring of Illegal Killing of Elephant is launched in 10 elephant reserves since 2003.</li> <li>• Project Elephant completed 30 years in 2022.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Established by-</b> CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora).</li> <li>• <b>First implementation-</b> It was started in South Asia (Bangladesh, Bhutan, India, Nepal and Sri Lanka) in the year 2004.</li> <li>• <b>Objective-</b> It is an international collaboration that tracks trends in information related to the illegal killing of elephants to monitor effectiveness of field conservation efforts.</li> </ul>

## 11.2 Kunming-Montreal Global Biodiversity Framework

### Why in news?

The University of Arizona hosted a symposium focusing on the rights of indigenous people that put spotlight on the Kunming-Montreal Global Biodiversity Framework (GBF)

### Kunming-Montreal Global Biodiversity Framework

- **Theme-** Ecological Civilization: Building a Shared Future for All Life on Earth.
- **Adopted-** At UN Convention on Biodiversity Diversity ([COP-15](#))
- **Aim-** To halt and reverse biodiversity loss by 2030 while respecting the rights of indigenous and local communities.
- **Paris agreement for nature-** It is being referred as the “Paris moment” for biodiversity, as 196 countries (excluding, significantly, the US) signed this historic deal.
- **Goals-** GBF contains 4 global goals ("Kunming-Montreal Global Goals for 2050").
- **Targets-** The framework contains 23 targets ("Kunming-Montreal 2030 Global Targets").
- **'30 by 30' target-** 30% of the Earth's land and oceans protected status by 2030.
- **Reduce harmful subsidies** - Reduce environmentally harmful subsidies by at least 500 billion dollar a year
- **Restore ecosystem** - Restore at least 30% area of degraded ecosystems.
- **Increase protected areas-** It sets target to increase terrestrial, inland water, and coastal and marine areas, especially those of particular importance for biodiversity and ecosystem functions and services,” to at least 30% of the world's terrestrial area.
- Currently, protected areas cover approximately 16% of the world's terrestrial area .

### Who are indigenous people?

- World Bank states that Indigenous Peoples are distinct social and cultural groups that share collective ancestral ties to the lands and natural resources where they live, occupy or from which they have been displaced.
- The land and natural resources on which they depend are inextricably linked to their identities, cultures, livelihoods, as well as their physical and spiritual well-being.
- **ILO-** In 1989 International Labour Organization Convention on Indigenous and Tribal Peoples protects Indigenous peoples from discrimination and specifies their rights to development, customary laws, lands, territories and resources, employment, education and health.
- **UN-** It adopted a declaration on the rights of indigenous people including their rights to self determination and to protect their cultures, identities, languages, ceremonies and access to employment, health, education and natural resources.

*Around 84% of India's national parks have been established in areas inhabited by indigenous peoples.*

### What are the implications of GBF on indigenous communities?

- **Threat to tribal lands-** The ambitious targets of the framework particularly the expansion of protected areas, pose a significant threat to indigenous communities in India.
- **Expansion of protected areas-** The proposed upgrades and expansion of wildlife sanctuaries and reserves, such as Kumbalgarh Wildlife Sanctuary and the Nauradehi Sanctuary, directly impact tribal villages and their inhabitants.
- **Marginalization-** The implementation of GBF targets risks further marginalizing indigenous people who have historically lived in harmony with their natural environment.
- **Forest (Conservation) Amendment Act, 2023-** It includes provisions for zoos, safaris and ecotourism demonstrates a shift towards prioritizing commercial interests over the rights of indigenous communities.
- **Human rights violation-** Indigenous communities within protected areas often face human rights violation, including denial of basic amenities such as housing, healthcare and education.
- **Displacement-** In South Asian countries like Indonesia and Cambodia, the establishment of national parks and wildlife sanctuaries has led to the displacement and disenfranchisement of indigenous people.

## Impact in India

- **Kumbalgarh Wildlife Sanctuary, Rajasthan**- Upgrading the Wildlife Sanctuary to tiger reserve would impact around 160 tribal villages located inside and outside the sanctuary.
- **Nauradehi Sanctuary, Madhya Pradesh**- Expansion of the sanctuary would affect 60 villages primarily inhabited by tribal people.
- **Barak Bhuban Wildlife Sanctuary, Assam**- The notification for the sanctuary poses a threat to indigenous groups such as the Khasis and Dimasas.
- Despite the gazette notification claiming the area to be free from encroachment, indigenous communities, like the Khasis, possess historical documents demonstrating their ancestral presence in the region since 1914.
- **Denial of basic rights**- The indigenous people in Ujungkulon National Park have been denied basic rights such as housing, health, education, electricity and security.
- **Recreational space**- The UN special Rapporteur on Indigenous People emphasized that protected areas which was created for recreational spaces and hunting ground for western colonial elites, it still prevails as certain ecotourism projects depict indigenous people as mere animals in zoo presenting them in model replicas of traditional homes, clothing and musical instruments.

### How the tribal lands should be protected?

- **Recognition of indigenous rights**- There is a need for India to recognize and uphold the rights of indigenous communities, including the right to free, prior and informed consent.
- **Custodian of protected areas**- Amendments to the existing laws, such as Panchayat (Extension to Scheduled Areas) Act should ensure that tribal communities are acknowledged as custodians of protected areas.
- **Inclusive development**- India must adopt policies that prioritize environmental protection without disproportionately impacting indigenous populations.
- **Equitable conservation policies**- The conservation efforts should be equitable and inclusive, considering biodiversity conservation in non-tribal regions as well.
- **Address human rights violations**-It is imperative for the Indian government to address human rights abuses within protected areas seriously.
- **Provide basic services**- Indigenous peoples' access to essential services and their rights to education, healthcare, and housing should not be neglected or left solely to wildlife or forest departments.

### What lies ahead?

- The Kunming-Montreal GBF aims to enhance global biodiversity conservation efforts, its implementation must consider and safeguard the rights and livelihoods of indigenous communities in India.
- Balancing conservation goals with respect for indigenous rights is essential for achieving sustainable and inclusive environmental stewardship.

## 11.3 National Clean Air Program

### Why in news?

The National Clean Air Program targets to achieve reductions up to 40% of PM 10 concentrations by 2025-26.

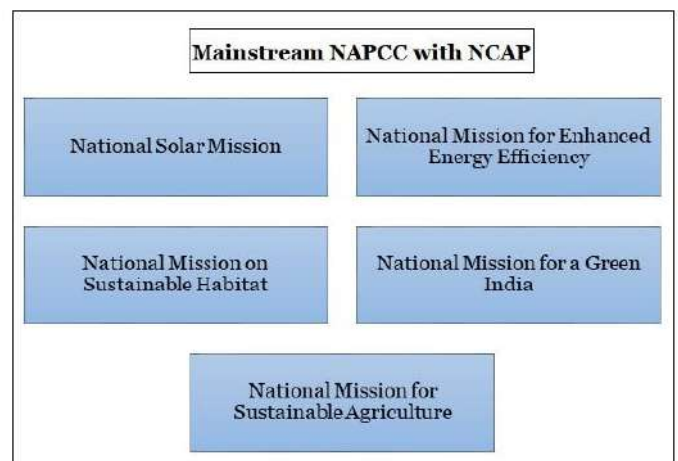
### National Clean Air Program

- **Year**- 2019
- **Ministry**- Ministry of Environment, Forest and Climate Change.
- **About**- The program is a pollution control initiative, the government committed funds as well as set targets for 131 (non-attainment cities) of India's most polluted cities.
- **Non-attainment cities**- They are called as non-attainment cities as they did not meet the national ambient air quality standards (NAAQS) for the period of 2011-15 under the National Air Quality Monitoring Program (NAMP).

- **Goal-** To meet prescribed annual average ambient air quality standards at all locations in the country in a stipulated timeframe (long-term).
- **Objectives**
  - Stringent implementation of mitigation measures for prevention, control and abatement of air pollution.
  - Augment public awareness and capacity building measures.
  - Augment and strengthen air quality monitoring network across the country
- **Tenure**
  - **Mid-term-** 5 years action plan to begin with keeping 2019 as base year.
  - **Long term-** The program is further extendable to 20-25 years after mid-term review of the outcomes
- **Phase-I** - It proposes a tentative national target of 20%-30% reduction in PM<sub>2.5</sub> and PM<sub>10</sub> concentrations by 2024, with 2017 as the base year for comparison.
- **Phase-II**-The government set a new target of a 40% reduction in particulate matter concentration, by 2026.
- **Fund-** The program is backed by 15<sup>th</sup> Finance Commission.
- **Cities responsibilities-** Cities are required to take measures to improve air quality inter-alia include solid waste management, control of pollution from biomass burning and air pollution from construction & demolition activities.
- **Non-binding-** The program is considered as a scheme rather than legal binding document hence there are no specified penal actions against cities that fail to meet the targets outlined in the program.
- **PRANA**– Portal for Regulation of Air-pollution in Non-Attainment cities, is a portal for monitoring of implementation of National Clean Air Programme (NCAP).
- **Status of air quality-** Out of 131 identified cities, decrease in PM<sub>10</sub> Concentration has been observed in 88 cities during 2022-23 as compared to levels during FY 2017-18.

### What is the approach of NCAP?

- **Collaborative approach-** The NCAP emphasizes collaborative, multi-scale, and cross-sectoral coordination among relevant central ministries, state governments, and local bodies, it ensures a comprehensive approach to air quality management.
- **Integration with existing policies-** The program seeks to integrate existing policies and programs, including the National Action Plan on Climate Change (NAPCC). By mainstreaming NAPCC initiatives, the focus is on five national missions
- **Enhancing effectiveness-** The NCAP aims to enhance the effectiveness of the policies and programmes that are already in place, this involves adjusting directions, expanding scope, and accelerating implementation within specified time frames.
- **Smart cities framework-** The program leverages the smart cities framework to launch its initiatives. Specifically, it targets the 43 smart cities among the 102 non-attainment cities—areas where air quality standards are not met.
- **Dynamic and evolving-** The program is designed to be dynamic, adapting to new scientific and technical information as it emerges. It remains responsive to international best practices and experiences in air quality management.



### How India can make significant impact in NCAP phase-II?

- **Emission inventory database-** NCAP should prioritize the development of an official emission inventory database covering all major cities and sources of pollution, this will ensure accurate reflection of emission trends and facilitate targeted interventions.

- **Transition to PM2.5 monitoring**- PM10 has been the primary focus in the initial phase, transitioning to PM2.5 monitoring is essential due to its more severe health impacts.
- **Holistic sectoral actions**- Parameters under framework like Swachh Vayu Survekshan should be considered to promote initiatives such as reducing biomass burning, industrial emissions compliance, and improving public transportation density.
- **Innovative financing mechanisms**- Urban Local Bodies play a significant role in implementing clean air initiatives hence NCAP should explore innovative mechanisms such as municipal bonds and social impact bonds to empower ULBs and overcome resource shortages.
- **Shift to airshed level planning**- Transitioning from city-level to airshed-level planning will extend NCAP's reach beyond urban centers, encompassing rural areas for a more inclusive impact.
- **Delhi model**- Initiatives like the Commission on Air Quality Management in the [Delhi-NCR region](#) can serve as models for effective governance structure and collaboration mechanisms at the airshed level.

*Graded response action plan is a set of measures drafted by the Centre's Commission for Air Quality Management (CAQM) to tackle air pollution in Delhi and NCR region.*

### What lies ahead?

- NCAP's recognition of the far-reaching impacts of particulate matter pollution on public health and the economy underscores its urgency.
- With a targeted reduction of particulate matter concentration by 40% by 2026, the NCAP signifies a determined push towards tangible improvements.
- The road to cleaner air is challenging, but the NCAP exemplifies India's potential to overcome the odds, fostering a future where breathability and well-being prevail.

## 11.4 New Green Credit Programme Rules

### Why in news?

Recently the Ministry of Environment, Forest and Climate Change has issued further guidelines on its Green Credit Programme that will prioritise the restoration of ecosystem.

### Green Credit Program (GCP)

- **About**- It is an *innovative market-based mechanism* introduced under LiFE (Lifestyle for Environment)
- **Goal**- To lay an emphasis on sustainability, reduce waste and improve the natural environment
- **Objective** – Incentivize voluntary environmental actions across diverse sectors by various stakeholders like individuals, communities, private sector industries, and companies.
- **GCP's governance framework** – Inter-ministerial Steering Committee and GCP administrator.
- **GCP Administrator** – Indian Council of Forestry Research and Education (ICFRE), it implements, manage, monitor and operate the program.
- **Focus** – Water conservation and afforestation.
- **Digital platform** – It will streamline registration of projects, its verification, and issuance of Green Credits.
- **Green Credit Registry and trading platform** – It allows buying and selling of Green Credits.
- **Green Credit Rules, 2023**- It empowers the Central Government to notify the methodology for calculating green credit based on the Administrator's recommendations.

### What are the concerns with Green credit program?

- **Commodification of conservation**- The program turns environmental conservation into a commodity, this is because the industries that clear forests for non-forestry purposes are required to compensate by afforesting an equivalent area.
- **Impact on Forest ecology**- The GCP's method of identifying 'degraded land parcels' for tree plantation is criticized for potentially disrupting local ecosystems and biodiversity. The term 'degraded' is considered vague and could lead to soil degradation and loss of ecosystem services.

- **Risk of ‘Green Deserts’**-The program might lead to the creation of ‘green deserts,’ or monoculture plantations, which lack the ecological complexity of natural forests. This could result from a forest measurement approach that focuses solely on tree count.
- **Loss of biodiversity hotspot**- The emphasis on afforestation in areas labelled as ‘wastelands’ is worrisome as these areas might include grasslands and other habitats that are crucial for carbon sequestration and species conservation, and their transformation into forested areas could result in biodiversity loss.
- **Impact on ecosystem**- India has diverse forest types, including grasslands and shrub-dominated areas hence inappropriate tree planting could introduce invasive species or hinder the development of a sustainable ecosystem.
- **Carbon trading issues**- The program’s provision of using green credits in carbon trading is contentious due to the unclear methodology for equating stored carbon from trees with carbon credits.

#### How the government responded to the concerns with the new green credit programme rules?

- **Afforestation rules**- It allowed entities to fund reforestation in designated degraded areas.
- **Role of States**- The State forest departments are responsible for the tree planting. After two years and an evaluation by the ICFRE, each tree earns one ‘green credit.’
- **Afforestation**- Currently, 13 States have been offered 387 parcels totalling 10,983 hectares for this purpose. Entities meeting the criteria will receive cost estimates for afforestation.
- **Updated guidelines**- The Environment Ministry issued guidelines for States to calculate the cost of restoring degraded forest landscapes.
- **Flexibility**- The new guidelines allow flexibility recognizing that not all degraded forests can support such tree density. In some areas, shrubs, herbs, and grasses may be suitable for ecosystem restoration.
- **Preference for indigenous species**- The new rules emphasized using indigenous species, and naturally growing seedlings will be retained during restoration efforts.
- **Role of public sector**- Several public sector companies, including Indian Oil, Power Grid Corporation, National Thermal Power Corporation, Oil India, Coal India, and National Hydropower Corporation, have registered to invest in the programme.
- **Pilot project mode**- The programme is currently in a “pilot project” mode and questions about quantifying shrubs and grasses in terms of green credits are still being addressed.
- **Partial offsets of obligations**- Companies won’t be able to fully offset their compensatory afforestation obligations using green credits but can claim a portion of it.
- **Equivalence issues**- The relationship between green credits and carbon credits is still being determined as it is important for integrating the programme with broader carbon trading markets and ensuring that the credits represent meaningful carbon sequestration.

*Previously, there was a requirement of a minimum of 1,100 trees per hectare for an area to qualify as reforested. However, the new guidelines allow flexibility, recognizing.*

#### What lies ahead?

- Green Credit Program represents a commendable step towards fostering environmental stewardship and sustainability.
- However, to achieve its objectives effectively, it must address the identified challenges and incorporate nuanced strategies that prioritize ecosystem restoration and biodiversity conservation.

### 11.5 Conserve Soil for Food Security

#### Why in news?

India did not sign the agriculture agreement in COP 28 as it would involve significant changes in agricultural policies and farming practice.

#### Major outcomes of COP28

- **Host**- [Dubai, United Arab Emirates](#)
- **Loss and Damage Fund**- World Bank will host the L&D facility as a financial intermediary fund (FIF) for an interim period of 4 years. It was 1st announced during COP27 in Sharm el-Sheikh, Egypt.

- **Global stocktake**- It is the *first ever global stocktake* that is designed to assess the collective progress towards achieving the purpose of Paris Agreement.
- **UAE Declaration on a New Global Climate Finance Framework**- It aims to make finance available, accessible and affordable bridging the trust gap between the Global North and Global South.
- **ALTÉRRRA**- It is the world's largest private investment initiative to attract more climate investment to Least Developed Countries (LDCs) and Small Island Developing States (SIDS).
- **Global Roadmap on Food and Agriculture**- It is a *first of its kind non-binding* global roadmap for food systems to be finalized at COP30 in Brazil, for the first time agriculture was brought into agreement.
- **Emirates Declaration on Resilient Food Systems, Sustainable Agriculture, and Climate Action**- Its aim is to promote food security while combatting climate change, *India refrained from signing* as it conflicted with its longstanding policy of not committing to climate.

### What are the challenges of food security?

- **Population growth**- Homo sapiens took over 200,000 years to reach a population of 1 billion in 1804, however the next billion was added in just 123 years by 1927.
- **Climate change**- It leads to extreme weather events such as droughts, floods, and heatwaves, which can devastate crops and livestock.
- **Limited natural resource**- Land degradation, water scarcity, and depletion of natural resources pose significant challenges to food production. Soil erosion, pollution, and overexploitation of water resources diminish agricultural productivity and threaten long-term food security.
- **Poverty**- It limits people's access to food by constraining their purchasing power and reducing their ability to produce or purchase food.
- **Income inequality** - It heightens disparities in access to food, with marginalized communities often facing the greatest barriers to food security.
- **Conflict**- It disrupts food production, distribution, and access, leading to food shortages, displacement, and humanitarian crises.
  - **Example**- Gaza and Haiti on the brink of famine due to ongoing war and crisis by criminal gangs respectively
- **Trade barriers**-Practices such as tariffs, and subsidies distort global food markets and can hinder access to affordable and nutritious food.
- **Environmental degradation**- Deforestation, biodiversity loss, and pollution degrade ecosystems and reduce their capacity to support agriculture.
- **Food waste**- Significant amounts of food are wasted or lost throughout the supply chain, from production and processing to distribution and consumption.

### Steps taken by India to provide food security

- **Green revolution (1960s)**- It refers to the large increase in production of food grains resulting from the use of high yielding variety (HYV) seeds especially for wheat and rice, Dr. M.S, Swaminathan was the key architect for this movement in India.
- **Integrated Management of Public Distribution System (IMPDS)** – The scheme entitles food grains from any Fair Price Shop (FPS) of their choice anywhere in the country.
- **National Food Security Act, 2013 (NFSA)** - Provides a legal right to persons belonging to eligible households to receive foodgrains at subsidised price.
- **Targeted Public Distribution System (TPDS)** - States were required to identify the poor for delivery of food grains and for its distribution in a transparent and accountable manner.
- **Antyodaya anna yojana (AAY)** - Aims at reducing hunger among the poorest segments of the Below Poverty Line population.
- **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)** -A food security welfare scheme announced during covid-19 where the centre provides provides **5 kg of free food grains** per month to the poor.

### What are the impact of food security policy on environment?

- **Soil degradation**- Heavy subsidies on chemical fertilizers, particularly urea, have led to imbalanced use of nitrogen (N), phosphate (P), and potash (K). which made soil deficient in organic carbon.
- **Poor Soil Organic Carbon (SOC)**- The optimal SOC level should be between 1.5% and 2%, but 60% of Indian soils have SOC levels below 0.5% due to excessive use of chemical pesticides.
- **Loss of biodiversity**- The use of HYV seeds displaced indigenous species and agricultural system that has led to loss of biodiversity and agricultural genetic resources aggravating the genetic vulnerability of many valuable gene pools.
- **Groundwater depletion**- Groundwater levels are falling in many Indian states, with critical conditions in Punjab, Haryana, and Rajasthan. This is attributed to free electricity for irrigation, minimum support prices, and unrestricted procurement of paddy, leading to excessive groundwater use.
- **Ecological impact**- The overuse of groundwater has resulted in an ecological crisis, with the water table dropping annually and paddy fields emitting about 5 tons of carbon per hectare.
- **Loss of crop diversity**- Policies have caused a shift in crop patterns, particularly in Punjab where rice cultivation increased from 4.8% in 1960 to over 40% today, replacing other crops like maize, millets, pulses, and oilseeds.
- **India's status**- India, with only 2.4% of the world's geographical area, 4% of global freshwater resources, and 18% of the world's population, is under huge stress, be it its soils, water, air (GHG emissions) or biodiversity.

### What lies ahead?

- The need of the hour is to implement policies that are beneficial to both peasant and the planet to save future generation.
- A holistic approach must be implemented to handle the climate change and extreme weather events are likely to increase causing massive damage to lives and livelihoods.
- Immediate action must be taken to create climate-resilient food systems, restore soil health, halt groundwater depletion, significantly reduce greenhouse gas emissions, and incentivize biodiversity conservation through green credits.

## 12. SCIENCE & TECHNOLOGY

### 12.1 ISRO's role in India's private space sector boom

#### Why in news?

The Indian Space Research Organisation (ISRO) is expanding its missions with private sector involvement boosted by 100% Foreign Direct Investment in the space sector.

#### ISRO

- Dr. Vikram Sarabhai is known as father of Indian space programme.
- Indian Space Research Organisation ([ISRO](#)) is the space agency of India.
- **Role**- It is involved in science, engineering and technology to harvest the benefits of outer space for India and the mankind.
- **Formation** - It was formed in 1969 and superseded Indian National Committee for Space Research (INCOSPAR), set up in 1962 by Dr. Vikram Sarabhai with an expanded role to harness space technology.
- Department of Space (DoS) was set up and ISRO was brought under DoS in 1972.
- **Objective**- Development and application of space technology for various national needs.
- **Space system**- ISRO has established major space systems for
  - Communication, television broadcasting and meteorological services
  - Resources monitoring and management;
  - Space-based navigation services.

## What are the steps taken by India to promote private participation in space sector?

### Antrix corporation Ltd.

- **Launch year-** 1992.
- **Administrative control-** It is a wholly owned Government of India Company under Department of Space.
- **Marketing arm of ISRO-** It is the commercial and marketing arm of ISRO.
- **Primary role-** To promote, market, and deliver ISRO's commercial products to international clients.
- It serves as a conduit between ISRO and private industry partners, facilitating technology transfer, etc.

### New Space India Limited (NSIL)

- **Launch year-** 2019
- **Administrative control-** It is a schedule A category company under Department of Space (DoS).
- **Role-** Responsible for commercialising space technologies and platforms created through public expenditure.
- **Business areas-** PSLV & SSLV manufacturing, launch services, satellite based services, satellite building.
- It will help in transferring technologies developed by ISRO to industries for commercialisation.

### IN SPACe

- **Launch year-** 2020
- **About-** Indian National Space Promotion and Authorisation Centre is a single window autonomous body established under Department of Space.
- **Aim-** To create an eco-system of industry, academia & start-ups to attract major share in global space economy.
- **Role-** The Centre is responsible to promote enable authorize and supervise various space activities of the Non-Government Entities (NGEs).

### National Geospatial Policy, 2022

- **About-** The policy issued guidelines for private companies to acquire geospatial data and maps from government agencies without licenses, permissions, or clearances, except for certain categories.
- **Aim** - To develop a geospatial ecosystem, democratize data, and strengthen integrated interfaces for digital data with location.
- The policy promotes private sector participation in collecting geospatial data and allows the Survey of India to maintain high-resolution orthoimagery.

### India Space Policy, 2023

- **Vision-** To enable, encourage and develop a flourishing commercial presence in space economy.
- NGEs shall be allowed to undertake end-to-end activities in space sector through establishment and operation of space objects, ground-based assets and services, such as communication, remote sensing, navigation, etc.,
- **IN-SPACE** will be the single window clearance and authorisation agency providing guidelines and regulations for NGEs.

*The Centre aims to boost Indian space economy from its current worth of 8 billion dollars (2% of global space economy) to 100 billion dollars by 2040.*

### Revised FDI guidelines

FDI in %	Allowed for
74%	Satellite manufacturing and operation
49%	Launch vehicles, spaceports, and associated systems.
100%	To manufacture components and systems/sub-systems for satellites, ground, and user segments
Investments beyond the specified limits is allowed via government route	

### What are the private players that are involving in space sector?

Private players	About	Successful outcomes
<b>Dhruva space</b>	<ul style="list-style-type: none"> <li>It is in Hyderabad which is specialized in designing customized satellites, ground stations, and launch services.</li> <li>It manufactures satellites for missions in Low Earth Orbit (LEO) and beyond, orbital deployers, ground stations, antennas, and space operations command systems.</li> </ul>	<ul style="list-style-type: none"> <li>Successfully tested and launched its indigenously developed satellite orbital deployers in ISRO's PSLV missions.</li> <li>Currently building a spacecraft manufacturing facility in Hyderabad after securing funding</li> </ul>
<b>Skyroot</b>	<ul style="list-style-type: none"> <li>It is in Hyderabad which focuses on manufacturing space launch vehicles.</li> <li>It is developing and testing three space vehicles and various rocket engines.</li> </ul>	<ul style="list-style-type: none"> <li>It became the first private Indian startup to successfully test liquid propulsion engines and a 3D printed cryogenic engine.</li> <li>It launched India's first private rocket, <a href="#">Vikram-S</a>, in 2022.</li> </ul>
<b>Agnikul cosmos</b>	<ul style="list-style-type: none"> <li>It is incubated at Indian Institute of Madras.</li> <li>It specializes in manufacturing space launch vehicles.</li> <li>It partnered with ISRO for technology support.</li> </ul>	<ul style="list-style-type: none"> <li>It tested its single-piece 3D printed engine Agnilet in 2022.</li> <li>It inaugurated India's <a href="#">first private mobile launchpad</a> and mission control center.</li> <li>It raised 11 million dollars in Series A funding and established the Agnikul Rocket Factory-1.</li> </ul>
<b>Manastu Space</b>	<ul style="list-style-type: none"> <li>It is a Mumbai based space startup that specializes in green tech for space and debris collision avoidance systems for CubeSats.</li> <li>Offers in-space services such as refueling satellites and removing expired satellites from orbits to reduce space debris.</li> </ul>	<ul style="list-style-type: none"> <li>It has signed deals with UK and French startups.</li> <li>In 2023, the company raised 3 million dollars in pre-series A round funding led by Indian Angel Network.</li> </ul>

## 12.2 The Hypothesis of Dark Energy

### Why in news?

The Dark Energy Spectroscopic Instrument (DESI) aims to uncover clues about dark energy by mapping the universe in three dimensions.

### Dark Energy Spectroscopic Instrument (DESI)

- It is a scientific research instrument for conducting spectrographic astronomical surveys of distant galaxies.
- Location-** The DESI is retrofitted onto the Mayall Telescope on top of Kitt Peak in the Sonoran Desert, US.
- International collaboration-** Over 900 researchers, including a team from the *Tata Institute of Fundamental Research in Mumbai*, are involved in this global project
- Goal-** To measure the effect of dark energy on the expansion of the universe.
- 3D map-** By obtaining optical spectra for tens of millions of galaxies and quasars, DESI constructs a 3D map spanning the nearby universe to a staggering 11 billion light years.
- Components-** Focal plane and a bank of spectrographs.
- Focal plane-** DESI houses an impressive array of 5,000 fiber-positioning robots which work together to precisely position optical fibers on celestial objects, allowing for efficient spectroscopic observations.
- Spectrographs-** DESI employs a bank of spectrographs that receive light from the fibers, it analyze the spectra of galaxies and quasars, providing valuable information about their composition and other properties.

### What is dark energy?

- Everything we see - the planets, moons, galaxies, organisms - makes up less than 5% of the universe.
- Dark energy is an invisible, repulsive energy that counteracts the gravitational attraction between matter, it causes the Universe's expansion to accelerate.
- **Discovery**-The existence of dark energy was inferred from observations of distant supernovae in the late 1990s, these observations revealed that the expansion of the Universe was accelerating, contrary to expectations.
- **Cosmic expansion**- Dark energy is responsible for the cosmic acceleration observed in the expansion of the Universe, it dominates the energy content of the Universe, accounting for about 68% of its total energy density.
- **Baryon Acoustic Oscillations (BAO)**- Scientists use baryon acoustic oscillations as a "standard ruler" to study dark energy, these oscillations are imprints left in the distribution of galaxies due to sound waves in the early Universe.
- Despite its importance, dark energy remains one of the greatest mysteries in astrophysics, hence its origin, nature, and behavior are still not fully understood.

Dark Matter	Dark Energy
Dark matter is a hypothetical form of matter thought to account for approximately 85% of the matter in the universe.	Dark energy is an unknown form of energy that is hypothesized to permeate all of space, tending to accelerate the expansion of the universe.
It is the second largest constituent of the universe, 27% of the universe is dark matter.	It is the single largest constituent of the universe, 68% of the universe is dark energy.
Dark matter works like an <i>attractive force</i> that holds our universe together.	Dark energy is a <i>repulsive force</i> that causes the expansion of our universe.
It interacts with normal matter like gravity.	There is no interaction with normal matter.
Xenon1T is designed to detect dark matter.	Euclid mission will study dark energy and dark matter.

### What are the key highlights of the new 3D map by DESI?

- **Unprecedented data**- DESI has captured light from 6 million galaxies, some dating back 11 billion years to create most detailed map of the universe yet.
- **Study dark energy**- DESI examines dark energy's impact on cosmic expansion, using baryon acoustic oscillations (BAO) as a "standard ruler."
- **Precision in expansion**- The experiment has achieved better than 1% precision in measuring the Universe's expansion, enhancing our understanding of cosmic evolution.
- **Measured expansion rate**- The team has measured the universe's expansion rate at 68.5 km/s per megaparsec, which could provide insights into the nature of dark energy.
- **Mystery of dark energy**- The map has led to measurements of the universe's expansion with unprecedented accuracy, suggesting that dark energy may *not be constant* over time, challenging the standard model.
- **Scientific surprise**- The vast empty spaces between stars and galaxies have been measured to be expanding at an accelerating pace, despite the countervailing force of gravitation that pull things together.
- **Hypothesis**- Scientists have been unable to find any explanation for this rapid expansion, and have been forced to hypothesis that there must be some "dark" energy causing this expansion.
- **Future insights**- With 4 more years of data collection, DESI may reveal changes in dark energy over time, refining our cosmological model.

### XENON1T

- It is the world's most sensitive dark matter experiment.
- **Operation**- It is operated deep underground at INFN Laboratori Nazionali del Gran Sasso, *Italy*.
- **Objective**- It have been designed to *directly detect dark matter*, by searching for signs of dark matter 'hitting' ordinary matter.

### Euclid mission

- **Objective-** To understand the evolution of the Universe by looking at the light emitted from galaxies 10 billion years ago.
- **Euclid Telescope-** It was launched by *European Space Agency* from Cape Canaveral in Florida.
- **Cosmology survey mission-** It is optimized to determine the properties of dark energy and dark matter on universal scales.
- The telescope will also focus on gleaning more information on *dark energy and dark matter* and will scan more than 1/3rd of the sky.

### 12.3 Data Embassies

#### Why in news?

The International Financial Services Centres Authority (IFSCA), a regulatory body for the GIFT City, is readying a framework for setting up a single window clearance system for data embassies.

#### What is a data embassy?

*Estonia is the world's first data embassy*

- A data embassy is a solution implemented by nation-states to ensure a country's *digital continuity* with particular respect to critical databases.
- It consists of a *set of servers* that store one country's data and are under that country's jurisdiction while being located in another country, the data archives stored are inviolable and thus exempt from search, requisition, attachment or execution.
- **Purpose-** To provide uninterrupted government services, even in challenging circumstances such as natural disaster, military invasion, cyberattacks, geopolitical conflicts etc.,
- **Estonia-** It has a stringent paperless policy and crucial databases existing only in digital format it explored data embassies after cyberattacks disrupted its digital infrastructure.
- **Diplomatic agreement-** It enables the home country and the host country to establish *three pillars of sovereignty* on the recovery site

Pillars of sovereignty	About
<b>Data sovereignty</b>	The home country retains access and control over its data, which is protected through encryption keys and not subject to the host country's jurisdiction
<b>Operational sovereignty</b>	The home country has continuous visibility and control over the provider operations and can maintain its services even during extreme scenarios.
<b>Software sovereignty</b>	The home country can choose the technical stack on which it operates, without depending on the provider's software.

#### What are the advantages of data embassies?

- **Resilience and continuity-** If a country faces extensive denial-of-service attacks or a military invasion that disrupts its data centers, having a backup in a data embassy abroad allows for swift recovery.
- **Security-** Data embassies provide data sovereignty while mitigating threats as keeping data localized within a single facility or geographical boundary can pose security risks.
- **Collaboration-** Data embassies foster collaboration among nation-states and stakeholders, they creatively interpret law and technology to protect and backup data effectively.
- **Efficient infrastructure-** Holding data in state-of-the-art data centers managed by service providers in other countries ensures efficient synchronization and service recovery.

*A denial-of-service (DoS) is a type of cyber-attack in which a malicious actor aims to render a computer or other device unavailable to its intended users by interrupting the device's normal functioning.*

- **Cost effective-** Setting up and maintaining data embassies can be cost-effective compared to building and managing redundant infrastructure within the home country.
- **Back up infrastructure-** Countries consider them as a vital back-ups for critical government collected data, copies of which already exist in the territory of the host country.
- **Jurisdiction-** Data embassies like traditional embassies operate as per the law of the country whose data is being stored in the data centre, not that of the host country. Data stored in these centres is also off-bounds from host state access, much like physical embassies.
- **Data security-** Hosting of Data and Information System agreement signed by Estonia and Luxemburg allows the establishment of data embassy along with immunity and inviolability of the data centre premises by any officials from Luxemburg while granting a right of access to authorized representatives of the Republic of Estonia.

### Global legal framework for data embassies

- **Estonia-** It entered into a bilateral treaty with Luxembourg in 2017 on the Hosting of Data and Information Systems.
- **Bahrain-** In 2018, it passed a legislative decree which encourages foreign parties (both private and public actor) to enter into an agreement with Bahrain to set up data centres there.
- **Monaco-** In 2021 Monaco's e-embassy was established in Luxembourg which finalized the storage of the Monaco's sensitive sovereign data.
- **India-** In Budget 2023, the government proposed for data embassies in the country to facilitate seamless digital transfers and continuity for other nations.

### What are the challenges with data embassy?

- **Legal complexity-** Establishing data embassies involve navigating complex legal framework, it raises crucial questions regarding jurisdiction, sovereignty and the applicability of local laws.
- **Operational challenges-** It include setting up and maintaining physical infrastructure, ensuring robust security measures, and addressing communication and coordination between countries.
- **Security risks-** The risk of data breaches or unauthorized access remains a challenge hence data embassies must have a secure, resilient infrastructure to protect against cyber threats and physical risks.
- **Privacy-** Countries may have differing privacy laws and regulation, hence the data stored must comply with privacy requirement which is critical.
- **International cooperation-** Data embassies require cooperation and trust among nations, establishing bilateral agreements and frameworks can be time-consuming.
- **Public acceptance-** Convincing citizens and stakeholders about the benefits and necessity of data embassies can be challenging.

### How India aims to make it as a global hub in data embassies?

- **Policy formulation-** MeitY is reportedly working on formulating a bespoke policy to allow countries and international companies to establish data embassies within Indian territory.
- **Diplomatic immunity-** The proposed policy is expected to offer diplomatic immunity to the data stored within these embassies, shielding it from Indian regulations.
- **Align with data protection legislation-** The policy on data embassies may be integrated into the existing Digital Personal Data Protection Bill, 2022 (DPDP), or drafted separately.
- **National cloud ecosystem-** MeitY aims to develop a national government cloud to store sensitive sovereign data locally, particularly related to national security.
- **State level policies-** Gujarat have introduced policies to attract investment in IT infrastructure including data centres.

### What lies ahead?

- By establishing data embassies, India can attract foreign and private sector investments, boost its digital economy, and highlight the quality of its IT sector.
- The initiative can create employment opportunities, contributing to India's efforts to become a global hub for data storage.

## 12.4 Cyber Slavery

### Why in news?

Over 5,000 Indians have been trapped and forced to commit cyber frauds, with victims in India losing approximately Rs 500 crore in the last six months.

### What is cyber slavery?

- It is also known as digital slavery is an *organized crime* which refers to the practice of exploiting individuals through digital means for labor or other purposes, often under coercive or deceptive conditions.
- While traditional forms of slavery involve physical captivity, cyber slavery occurs in the virtual realm, where individuals are manipulated, controlled, and exploited through various online channels.
- **Coercion**- Cyber slavery involves coercing or deceiving individuals into exploitative situations, it includes false promises of employment, threats, manipulation, or other forms of coercion to compel individuals to perform certain tasks or activities.
- **Online exploitation**- It typically involves the use of digital platforms, technology, and communication channels for exploitation.
- **Virtual captivity**- While individuals may not be physically confined, they may be effectively held captive through digital means. For example, their personal information, financial assets, or reputation may be controlled or threatened, making it difficult for them to escape or seek help.
- **Global presence**- Cyber slavery is not confined by geographical boundaries and can occur on a global scale, perpetrators may operate from different countries, targeting vulnerable individuals worldwide through the internet.
- **Diverse forms**- Cyber slavery can manifest in various forms, including but not limited to forced labour in *online scams*, coerced participation in cybercrime activities, exploitation in the digital gig economy, or involuntary servitude through online platforms.

### What is the recent issue of cyber slavery in Cambodia?

- Over 5,000 Indians are reported to be trapped in Cambodia, where they are allegedly being coerced into carrying out cyber frauds.
- Individuals are lured to Cambodia under false pretenses, often promised data entry jobs. However, upon arrival, they are forced to engage in cyber fraud activities, including posing as law enforcement officials or using fake social media profiles to scam people.
- The scams involve various tactics, including posing as women on dating apps to convince targets to invest in cryptocurrency trading or fake stock investments.
- The Indian government, particularly the *Ministry of Home Affairs (MHA)*, is actively engaged in addressing the issue, they have held meetings with various ministries and security experts to devise a strategy for rescuing those trapped in Cambodia.
- Law enforcement agencies, such as the Rourkela Police in Odisha, have taken actions against cyber-crime syndicates involved in this scam. They have made arrests and are coordinating with immigration authorities to detain suspects attempting to return from Cambodia.
- Some individuals have been successfully rescued with the help of government agencies and organizations like the Non-Resident Indian Forum of the Government of Karnataka (NRIFK).
- Authorities are considering seeking assistance from Interpol to arrest key players involved in the scam.

### What are the challenges in cyber slavery?

- **Challenges in detection**- Cyber slavery operates in the digital shadows, making it difficult to track down perpetrators, their anonymity allows them to hide behind pseudonyms, encrypted communication channels, and virtual private networks (VPNs).
- **Jurisdictional challenges**- The internet transcends national borders, complicating legal jurisdiction. Perpetrators can operate from one country while victimizing individuals in another.
- **Pseudonymity**- Perpetrators often use fake identities, making it challenging to identify and trace them.
- **Ephemeral evidence**- Digital evidence can vanish quickly due to data deletion, encryption, or rapid changes in online platforms.

- **Resource constraints-** Law enforcement agencies face resource limitations, both in terms of personnel and technology.

### What lies ahead?

- *Raising awareness* about cyber slavery is crucial, it can be done through public campaigns, educational programs and media coverage can inform people about the risks and signs of exploitation.
- Governments must enact and enforce *robust legislation* specifically targeting cyber slavery, these laws should cover both domestic and international cases, addressing jurisdictional challenges.
- The need of the hour is *international cooperation* it can be facilitated through Mutual legal assistance treaties (MLATs) that fosters information sharing, extradition, and joint investigations.
- The *victims should be empowered* through establishing helplines, counselling services, safe spaces etc., this would make them come forward.
- Technology companies should adopt *ethical supply chain practices*, ensuring their products and services are not inadvertently linked to cyber slavery.

### Steps taken by India to combat cyber attacks

- **Indian Computer Emergency Team (CERT- In)-** It is operational since 2004, it collects, analyses, and disseminates information on cyber incidents.
- **National Cyber Security Coordinator -**It is under the National Security Council Secretariat, it coordinates with different agencies at the national level on cybersecurity issues.
- **National Critical Information Infrastructure Protection Centre -** It has been set up for the protection of national critical information infrastructure.
- **Cyber Swachhta Kendra -** It is a Botnet Cleaning and Malware Analysis Centre that has been launched for detection of malicious software programmes and to provide free tools to remove them.
- **Indian Cyber Crime Coordination Centre (I4C)-** It is an initiative of the Ministry of Home Affairs (MHA) to combat cyber-crime in the country.
- **Cyber Crisis Management Plan -** It has been formulated by the government to counter cyber-attacks
- **Cyber Surakshit Bharat -** It aims to ensure awareness about cybercrime and adequate safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments.
- **Cyberdome-** It is Kerala State police department's premier facility dedicated to prevent cybercrime and mitigate security threats to the State's critical information infrastructure.

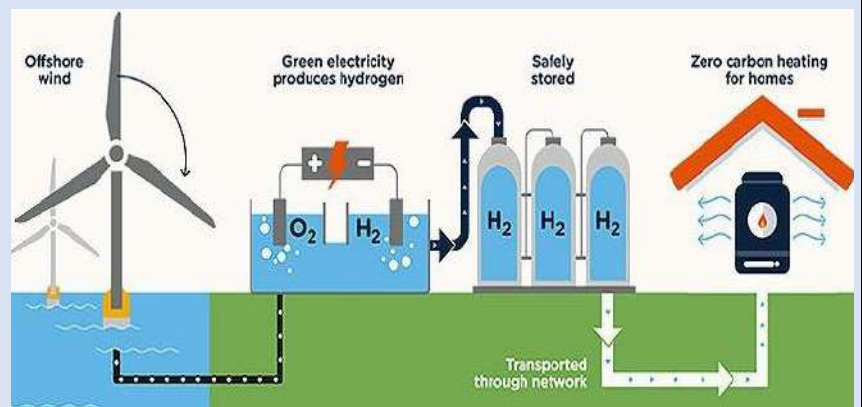
## 12.5 Green Hydrogen

### Why in news?

Recently the Ministry of New and Renewable Energy has introduced pioneering scheme to advance green hydrogen adoption through pilot projects.

### Green Hydrogen

- Hydrogen is an abundant, cheap and clean-burning which is described as the fuel of the future.
- It is produced using *electrolysis of water* with electricity generated by renewable energy.
- The *carbon intensity* ultimately depends on the carbon neutrality of the source of electricity (i.e., the more renewable energy there is in the electricity fuel mix, the "greener" the hydrogen produced).



## What are the advantages of green hydrogen?

- **Reduction of emissions-** Green hydrogen, produced from renewable energy sources, offers a clean alternative to traditional fossil fuels it will significantly reduce harmful emissions such as carbon dioxide and particulate matter.
- **Curbing pollution-** The adoption of hydrogen fuel in transportation can play a crucial role in curbing pollution in Indian cities, which are grappling with severe air quality issues.
- **Meet climate goals-** India has committed to ambitious climate targets under the Paris Agreement and Panchamrit was adopted by India at COP26.
- **Reducing fossil fuel imports-** By developing a domestic green hydrogen industry, India can reduce its dependence on costly fossil fuel imports, enhance energy security, and diversify its energy sources, thereby bolstering its resilience to supply disruptions and price fluctuations in the global energy market.
- **Business opportunity-** The transition to green hydrogen presents a significant business opportunity for India, both domestically and internationally. emerging hydrogen economy, attracting investment, creating jobs, and driving economic growth in key sectors such as manufacturing, energy, and transportation.
- **Zero carbon emission-** Hydrogen Fuel Cell Vehicles utilize hydrogen through combustion (similar to diesel and petrol cars) but emit no carbon
- **Energy efficiency-** The Hydrogen Fuel Cell Electric Vehicles convert hydrogen stored in a high-pressure tank into electricity via electrochemical reactions, research indicates that burning hydrogen in ICE vehicles is less energy-efficient than using it in fuel cells.

Panchamrit
<p><i>By 2030, India will</i></p> <ul style="list-style-type: none"> <li>○ Reach its non-fossil energy capacity to 500 GW</li> <li>○ Meet 50% of its energy requirements from renewable energy</li> <li>○ Reduce the total projected carbon emissions by 1 billion tonnes</li> <li>○ Reduce the carbon intensity of its economy by less than 45%</li> </ul> <p><i>By 2070, India will achieve the target of Net Zero.</i></p>

## Steps taken by India to promote green hydrogen

- **Scheme for green hydrogen in transportation-** It validate technical feasibility and performance of green hydrogen as a transportation fuel.
- **Pilot projects for mobility-** It will assess the practicality of green hydrogen as a fuel in buses, trucks and four wheelers that will help bridge the viability gap arising from the relatively higher capital costs associated with hydrogen powered vehicles.
- **National green hydrogen mission**- It aims to position India as a global hub for green hydrogen production, usage and export, this would make India self-reliant in clean energy and inspire a global transition towards cleaner energy sources.
- **SIGHT-** Strategic Interventions for Green Hydrogen Transition includes financial incentive mechanisms for manufacturing electrolyzers, green hydrogen production to promote green hydrogen adoption.
- **Green hydrogen hubs-** It will identify and develop regions capable of supporting large-scale green hydrogen production and utilization which will serve as green hydrogen hubs.
- **Enabling policy framework-** The mission will waive interstate transmission charges for renewable energy in green energy production, facilitate renewable energy banking and time bound grant of open access and connectivity to facilitate green hydrogen production.
- India's *1st Green Hydrogen plant in stainless steel sector* is recently inaugurated in Haryana, it will be the world's 1st off-grid Green Hydrogen plant for the stainless-steel industry and the world's 1st Green Hydrogen plant with rooftop and floating solar.

## What are the challenges in green hydrogen?

- **High cost-** The high cost of producing green hydrogen, primarily due to the energy-intensive electrolysis process, remains a major barrier.
- **Logistical challenges-** Green hydrogen requires specialized infrastructure for storage and transportation, which adds to the overall cost and complexity of the hydrogen supply chain.

- **Infrastructure deficit**- The high cost of infrastructure deployment and limited consumer demand pose significant challenges.
- **Market dynamics**- Green hydrogen currently faces stiff competition from conventional fuels and battery electric vehicles (BEVs), particularly in terms of fuel costs and infrastructure availability.
- **Storage concerns**- The lack of suitable storage solutions for high-pressure hydrogen cylinders presents a significant technical barrier.
- **Safety concerns**- Hydrogen's flammability requires stringent safety standards and protocols for handling and storage, especially at refueling stations.
- **Stiff competition**- Advances in battery technology and the decreasing cost of electric vehicle batteries pose a long-term challenge to the viability of hydrogen fuel cell vehicles, particularly in the heavy-duty commercial vehicle sector.

## 12.6 Extraction of Hydrocarbon

### Why in news?

Over millions of years, organic materials from deceased organisms undergo geological processes such as heat and pressure within the Earth's crust that transforms these into hydrocarbons.

### Where hydrocarbons are located?

- **Rock formation**- The most common forms in which these hydrocarbons exist in subterranean rock formations are natural gas, coal, crude oil, and petroleum.
- **Reservoirs**- Hydrocarbons are typically found in underground reservoirs, they are created when a more resistant rock type overlays a less resistant one, effectively creating a "lid" that traps the hydrocarbons below it.
- **Kerogen**-The primary source of hydrocarbons in the **underground formations** called kerogen, which consists of lumps of organic matter.

*Rock formation are crucial as they prevent hydrocarbons from floating to the surface and dissipating.*

Sources of kerogen	About	Benefits
Lacustrine	Remains of a lake ecosystem	It yields waxy oils.
Marine	Remains of a larger marine ecosystem	It produces oil and gas.
Terrestrial	Remains of a terrestrial ecosystem	It results in light oils, gas and coal.

Extraction of Hydrocarbons	About
Completion stage	<ul style="list-style-type: none"> <li>• After drilling, the well undergoes completion, which prepares it to drain hydrocarbons.</li> <li>• Engineers remove the drill string and punch holes in the casing to allow hydrocarbons to flow into the well.</li> </ul>
Natural pressure flow	<ul style="list-style-type: none"> <li>• Often, the pressure inside the well is lower than in the surrounding rock, causing hydrocarbons to flow upward naturally.</li> <li>• A narrower tube at the top directs the fluids to flow out in one direction.</li> </ul>
Production stage	<ul style="list-style-type: none"> <li>• The flow of hydrocarbons signifies the end of the completion stage and the start of production.</li> <li>• Systems at the wellhead control the outflow using valves.</li> </ul>
Pump jacks	<ul style="list-style-type: none"> <li>• If the pressure difference is insufficient, pump jacks may be used to mechanically lift hydrocarbons from the well.</li> </ul>

<b>Work-overs</b>	<ul style="list-style-type: none"> <li>Long-standing wells might need workovers, which involve adding or replacing components to enhance hydrocarbon recovery.</li> </ul>
<b>Production phases</b>	<ul style="list-style-type: none"> <li><b>Primary phase</b>-Relies on natural processes like pressure differences and buoyancy.</li> <li><b>Secondary phase</b>- Involves inducing artificial pressure to maintain flow (e.g., water injection).</li> <li><b>Tertiary phase</b>- Uses enhanced recovery methods like steam injection to force remaining hydrocarbons out.</li> </ul>
<b>Yield percentages</b>	<ul style="list-style-type: none"> <li>During petroleum recovery, a well might yield approximately 15% in the primary phase, 45% in the secondary, and 15% in the tertiary phase</li> </ul>

- Stopping extraction**- The contractor may cease extraction activities if the well is not producing enough to be profitable.
- Plugging the well**-The well must be plugged to prevent hydrocarbons and gases from escaping into the environment. Plugs can be temporary (if there's a possibility of recommissioning the well) or permanent.
- Plugging issues**- Improperly plugged wells can lead to environmental issues. Plugs may deteriorate or fail due to quality issues or external disturbances.
- Decommissioning**- The most thorough method of concluding operations is decommissioning the well. The process is comprehensive but can be expensive and sometimes commercially unfeasible.
- Environmental concerns**- Improperly abandoned wells can be significant sources of methane emissions. The production and use of equipment for hydrocarbon extraction also contribute to emissions.

*A study from 2018 estimated that 9,000 oilfields across 90 countries released 1.7 billion tonnes of carbon dioxide in 2015.*

## 12.7 Indian Patent System

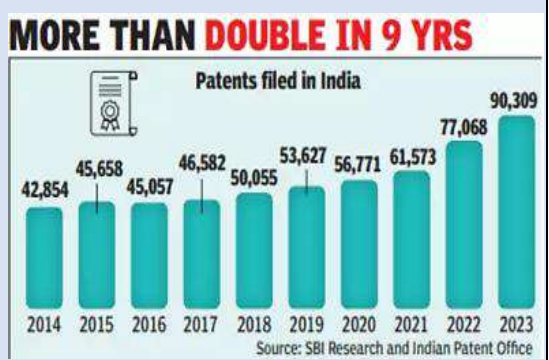
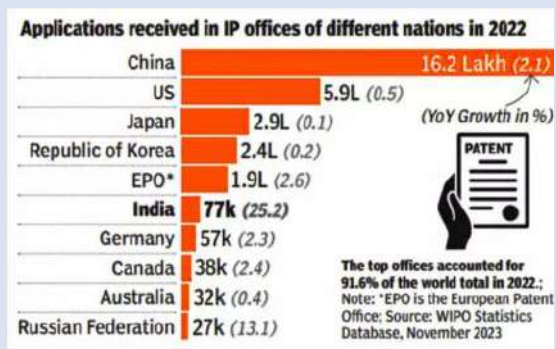
### Why in news?

Centre's Patent (Amendment) Rules, 2024 has raised concerns about public health implications.

### Status of patents in India

- A patent is an **exclusive right granted for an invention.**
- To get a patent, technical information about the invention must be disclosed to the public in a patent application.
- Once a patent expires, the protection ends, and an invention enters the public domain.
- Patent publications**-There has been a 56% increase in patent publications in 2023 compared to 2019.

**Patent grants**-The number of patents granted in 2023 has seen a 220% jump since 2019.



**Application refusal**-There was a 94% increase in application refusals in 2023 compared to the previous years.

- Bangalore**- It has emerged as an innovation hub, overtaking Delhi in patent filings.
- Global Innovation Index**- It is released by **World Intellectual Property Organization**, India has moved up the Global Innovation Index rankings from 81 in 2015–16 to **46 in 2021.**

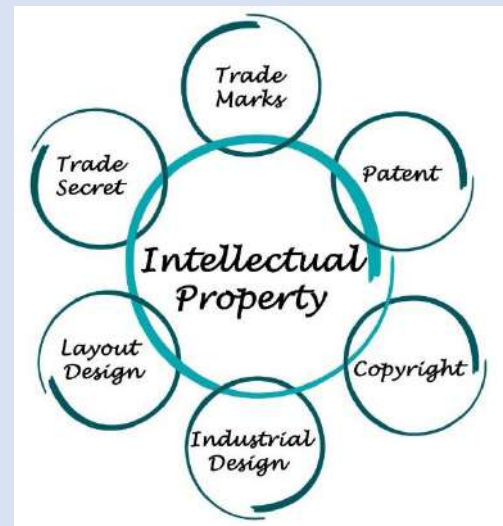
## What are the legal provisions that govern patent system in India?

- **Indian Patents and Designs Act, 1911**- The Controller of Patents and Designs was responsible for patent administration.
- **Patent Act, 1970**- It is India's first independent patent law which played vital role in the growth of industries, notably the pharmaceutical sector, earning India the title "*the pharmacy of the world.*"
- **GATT**- In 1991, India liberalized its economy and adhered to the General Agreement on Tariffs and Trade (GATT 1947), which was succeeded by the WTO, resulting in amendments being introduced in line with the TRIPS Agreement.
- **Patent (Amendment) Act, 2005**- It extending product patents in all areas of technology including food, medicine, chemicals and microorganisms.
- **Patent (Amendment) Rules, 2024**- The aim of the amendments was to streamline the working of the Indian Patent Office, enhance protection and support innovation in India.

*Patent Act, 1970 is based on the recommendations of Bakshi Tekchand Committee (1949) and the Justice Rajagopal Ayyangar Committee*

## International obligations of India in patent system

- **TRIPS agreement**- The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is an international legal agreement that establishes *minimum standards* for the regulation by the national governments of different forms of IP between all the member nations of the WTO.
- **Doha declaration**- In 2001, the WTO Ministerial Conference in Doha, Qatar emphasized interpreting the TRIPS Agreement to support public health. Developing economies like India stressed the importance of expanding health coverage at low and affordable costs.
- **Patent Cooperation Treaty- India signed** and acceded in 1998, Patent (Amendment) Act, 2002 has incorporated provisions for PCT applications into Indian law.
- **Receiving offices**- India (New Delhi, Kolkata, Chennai and Mumbai) and International Bureau in Geneva were designed to receive international applications.
- **Patent Prosecution Highway (PPH)**- It facilitate the sharing of search reports and other relevant information, Indian Patent Office launched its first bilateral PPH program with **Japan Patent office**.



## What are the key provisions of Patent (Amendment) Rules 2024?

- **Expedited examination**- Applicants can request an examination within 31 months of the priority date to accelerate the patent process.
- **Digitalization**- Transition to digital platforms for submissions and communications, with revised deadlines for providing information on foreign applications.
- **Certificate of inventorship**- Inventors can now request a certificate via Form 8A, which will include their name, recognizing their contribution.
- **Pre-grant opposition process**- The process has been streamlined, representations must be considered by the Controller within one month, and an official fee is introduced, discouraging frivolous oppositions.
- **Advance payment discount**- Patentees are offered a 10% discount for advance payments covering at least 4 years, made electronically.
- **Simplification**- The patentees are no longer required to submit value or sales data for the patent in India annually.

## What are the issues in India's patent system?

- **Manpower shortage**- The major reason for delays in the patents is the lack of sufficient manpower in patent office.
- **Limited application**- The number of patents applied and granted in India is still a fraction compared to the patents granted in China, USA, Japan, and Korea.

- **Special 310 report-** India continues to be on the '[Priority Watch List](#)' of the United States Trade Representatives for lack of adequate IP rights protection and enforcement, this would impact US investments in India.
- **Lack of transparency-** Recent 2024 amendment has been made without parliamentary discussion or transparent justification, have drawn criticism for potentially compromising public health and access to essential medications.
- **Dilution of patent provisions-** The government has been making concessions to meet the demands of industrialized countries and pharmaceutical companies, which may have influenced the dilution of certain patent provisions.
- **Lack of accountability-** The companies no longer need to file Form 27 that compelled patent holders to disclose every year if their patents are being worked in India or not, with details of quantity and value.

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