

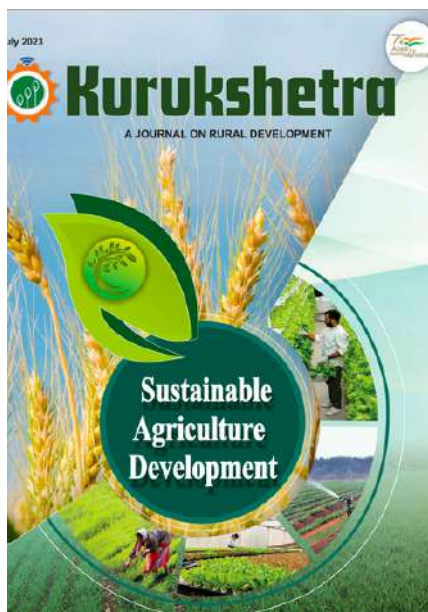
# OFFICERS' Pulse

## DIGEST

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# Schemes

## 1) Pradhan Mantri Kaushal Vikas Yojana

### About PMKVY

- Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is the flagship scheme of the **Ministry of Skill Development & Entrepreneurship** implemented by **National Skill Development Corporation (NSDC)**. The scheme was launched in 2015.
- It is implemented under the **Skill India Mission**.
- The objective of this programme is to **enable a large number of Indian youth to take up industry-relevant skill training** that will help them in securing a better livelihood.
- Individuals with prior learning experience or skills will also be assessed and certified under **Recognition of Prior Learning**.
- Skill training is based on the **National Skill Qualification Framework (NSQF)** and industry led standards.

### Objectives of PMKVY

- To impart industry-related skills to the **unemployed youth and school/college dropout**;
- To provide **financial and placement assistance** to trained candidates.

### PMKVY has three key components

- **Short Term Training (STT):** Under this component, training is given to unemployed youths or school/college dropouts in line with the National Skills Qualification Framework.
- **Recognition of Prior Learning:** Under this module, assessment and certification is given to applicants with existing skills or a prior learning experience.

- **Special Projects:** This module has been designed to create a platform that facilitates training for special job roles in government, corporate or industrial bodies.

### Why in News?

- The Ministry of Skill Development and Entrepreneurship announced that over 27 lakh 87 thousand candidates were skilled under Pradhan Mantri Kaushal Vikas Yojana (PMKVY) between 2020 and 2023.
- Out of 12.94 lakh women candidates trained in the last three years, under PMKVY, 2.16 lakh have been reported placed in a job.

### Related Information

#### About NSQF

- The National Skills Qualifications Framework is a **competency-based framework** that **organizes all qualifications according to a series of levels of knowledge, skills and aptitude**.
- These levels, graded from one to ten, are defined in terms of learning outcomes which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning. NSQF in India was notified in **2013**.
- Under NSQF, the learner can acquire the **certification for competency** needed at any level through **formal, non-formal or informal learning**. In that sense, the NSQF is a **quality assurance framework**.

#### About NSDC

- National Skill Development Corporation is a **not-for-profit public limited company** incorporated in 2008.
- NSDC was set up by the **Ministry of Finance** as a **Public Private Partnership (PPP) model**. The

**Government of India** through the Ministry of Skill Development & Entrepreneurship **holds 49% of the share capital** of NSDC, while the **private sector has the balance 51%** of the share capital.

- NSDC acts as a catalyst in skill development by providing funding to enterprises, companies and organizations that provide skill training.
- Its mandate is also to enable a support system which focuses on quality assurance, information systems and train the trainer academies either directly or through partnerships.

## 2) PM-DevINE

### About the Scheme

- The **Prime Minister's Development Initiative for North-East Region (PM-DevINE)** was announced by the government in the **Union Budget 2022-23**.
- It is a **Central Sector scheme, with 100% Central funding**.
- PM-DevINE is aimed at **rapid and holistic development of the North- East Region** by **funding infrastructure and social development projects**, based on felt needs of the States.
- It strives to fill the gaps in various sectors and **will not be a substitute for existing Central and State Schemes**.
- The objectives of PM-DevINE are:
  - To **Fund infrastructure convergently**;
  - To **Support social development projects** based on felt needs of the North East;
  - To **Enable livelihood activities** for youth and women;
  - To **Fill the development gaps** in various sectors.

- PM-DevINE is implemented by the **Ministry of Development of North Eastern Region (DoNER)** through the **North Eastern Council** or Central Ministries/agencies.

### Why in News?

- The Government of India has allocated Rs. 1500 crore for the PM-DevINE scheme.

### Related Information

#### North Eastern Council

- The North Eastern Council is the **nodal agency for the economic and social development** of the **North Eastern Region** which consists of the **eight States** of **Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura**.
- It is a **statutory organization** established under the **North Eastern Council Act, 1971** at **Shillong, Meghalaya**.
- Initially, NEC was an Advisory Body for the North Eastern Region. Now NEC is mandated to function as a **Regional Planning Body** for the North Eastern Region.
- The Council comprises **Governors and Chief Ministers** of constituent States and **three members nominated by the President**.

## 3) Pradhan Mantri Swasthya Suraksha Yojana

### About the Scheme

- Government of India is implementing Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) which aims at **correcting regional imbalances in the availability of affordable tertiary healthcare services and to augment facilities for quality medical education** in the country.
- It was launched in **2006**.
- PMSSY has two components:-

- **Setting up of All India Institute of Medical Sciences (AIIMS); and**
- **Upgradation of existing Government Medical Colleges/Institutions (GMCIs).**

#### Why in News?

- So far, the setting up of 22 new AIIMS and 75 projects of upgradation of GMCIs have been approved under PMSSY in various phases.

### 4) PM-KUSUM Scheme

#### About the Scheme

- The Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Scheme was launched in **2019** for **installation of solar pumps and grid connected solar and other renewable power plants** in the country.
- It was launched by the **Ministry of New and Renewable Energy**.
- Under the scheme, farmers are provided **subsidies for setting up stand-alone solar pumps and to solarise their grid-connected pump sets**.
- This scheme enables farmers to set up **solar power generation capacity on their barren lands** and to **sell it to the power grid**.
- The Scheme consists of **three components**:
  - **Component-A:** Setting up of decentralized ground/ stilt mounted grid connected solar or other renewable energy based power plants up to 2 MW capacity;
  - **Component-B:** Installation of stand-alone solar agriculture pumps of capacity up to 7.5 HP;
  - **Component-C:** Solarisation of existing grid connected

agriculture pumps of capacity up to 7.5 HP.

#### Benefits of the Scheme

- The Scheme will have substantial environmental impact in terms of **savings of CO2 emissions**. All three components of the Scheme combined together are likely to result in saving about 27 million tonnes of CO2 emission per annum.
- Further, Component-B of the Scheme on standalone solar pumps may result in **saving of 1.2 billion liters of diesel per annum** and **associated savings in the foreign exchange** due to reduction of import of crude oil.
- The scheme has **direct employment potential**. Besides increasing self-employment the proposal is likely to generate employment opportunities equivalent to **6.31 lakh job years** for skilled and unskilled workers.
- In addition, the scheme would provide **additional income to farmers**, by giving them the option to sell additional power to the grid, through solar power projects set up on their barren lands.
- The scheme also reduces the government's burden of **power subsidy in the agriculture sector**.

#### Why in News?

- Nearly 2.46 lakh farmers have benefited from the PM-KUSUM Scheme.

### 5) UDAN Scheme

#### About the scheme

- In 2017, the **Ministry of Civil Aviation** launched the Regional Connectivity Scheme (RCS) "UDAN" (Ude Desh Ka Aam Naagrik) which aims at **providing connectivity to un-served and under-served airports** of the country.

- It aims to achieve its objective through **revival of existing air-strips and airports** to make **flying affordable** to the common man who wants to travel to and fro the Tier 2 and Tier 3 cities of the country.
- UDAN has a unique market-based model. Airline routes are allocated to operators selected through a **competitive bidding mechanism**.
- Under the scheme, nearly **half of the seats in UDAN flights are offered at subsidised fares**, and the participating carriers are provided a certain amount of **viability gap funding (VGF)** - an amount shared between the Centre and the concerned states.
- The scheme also offers **waiver of certain statutory charges and taxes on jet fuel** to companies in order to offer affordable connectivity.
- The **Airports Authority of India (AAI)** is designated as the Implementing Agency under this Scheme.
- Following four successful rounds of the scheme, the Ministry of Civil Aviation recently launched **UDAN 5.1** to **further enhance the connectivity to remote areas of the country and achieve last mile connectivity through helicopters**. For the first time under RCS-UDAN, this round is **designed specifically for helicopter routes**.

#### Why in News?

- The Ministry of Civil Aviation has announced that discontinued

routes under the UDAN scheme are being put up for bidding again.

- **50% of RCS routes have shut down** since the launch of the scheme in 2017, and as a result, 15 airports developed under the scheme had fallen into disuse.
- According to the Civil Aviation Minister, more than 1.23 crore people and 2.23 lakh flights have flown under the UDAN scheme.

#### Related Scheme

##### Krishi UDAN

- The Krishi Ude Desh Ka Aam Naagrik (Krishi Udan) scheme was launched in 2020 to **assist farmers in transporting agricultural products on international and national routes so that it improves their value realisation**.
- It is an initiative of the **Ministry of Civil Aviation**.
- The objective is to **increase the share of air in the modal mix for transportation of Agri-produce**, which includes horticulture, fishery, livestock & processed products.

##### Krishi UDAN 2.0

- In a bid aimed at facilitating and incentivising the movement of agricultural produce through air transportation, especially biodegradable food products from **hilly areas, north-eastern States and tribal regions**, MoCA launched the **Krishi Udan 2.0** in 2021.
- **Krishi UDAN 2.0 primarily focuses on the hilly areas, North-Eastern states, and tribal areas.**

# Initiatives

## 1) Atal Innovation Mission

### About the Mission

- The Atal Innovation Mission (AIM) is a flagship initiative set up by the **NITI Aayog to promote innovation and entrepreneurship** across the length and breadth of the country. It was setup in **2016**.
- Towards this end, AIM has taken a **holistic approach** to ensure creation of a problem-solving innovative mindset in schools and creating an ecosystem of entrepreneurship in universities, research institutions, private and MSME sector.

### Initiatives under Atal Innovation Mission

#### Atal Tinkering Labs - at School Level

- AIM has launched the establishment of thousands of Atal Tinkering Labs enabling students from **grade 6 to grade 12** to have access to and tinker with innovative tools and technologies like 3D printers, robotics, miniaturised electronics do-it-yourself kits, thus stimulating a problem solving innovative mindset to solve problems in the community they are in.

#### Atal Incubators at Universities, Institutions, Industry Level

- To promote creation of a supporting ecosystem for start-ups and entrepreneurs, AIM has been establishing world-class incubators called **Atal Incubation Centres (AICs)** in universities, institutions, corporates, etc. that would foster innovative start-ups and become scalable and sustainable enterprises.

#### Atal Community Innovation Centres

- To promote the benefits of technology led innovation to the

**unserved/ underserved regions of India including Tier 2, Tier 3 cities, aspirational districts, tribal, hilly and coastal areas,** AIM is setting up Atal Community Innovation Centres (ACICs) with a unique partnership driven model wherein AIM would **grant up to Rs. 2.5 crore** to an ACIC subject to a partner proving equal or greater matching funding.

#### Atal New India Challenges

- To create **product and service innovations having national socio-economic impact**, AIM has launched Atal New India Challenges in partnership with five different ministries and departments of the central government.

#### Applied Research and Innovation for Small Enterprises (ARISE)

- To promote **innovation in a phased manner in the MSME/Start-up sector**, AIM launched ARISE along with partner Ministries so that great research ideas are converted to viable innovative prototypes followed by product development and commercial deployment.

#### Mentorship and Partnerships

- To enable all the initiatives to succeed, AIM has launched the **"Mentor India - The Mentors of Change"** programme, in collaboration with the public sector, corporates and institutions, to support all the initiatives of the mission.

#### Why in News?

- NITI Aayog has launched the **National Space Innovation Challenge 2023 (NSIC 2023)** for all school students across the country under the Atal Innovation Mission.



- It has been launched with the goal of giving an open platform where they can innovate and enable themselves to solve modern-day space technology problems.

## 2) Smart Cities Mission

### Need for the Mission

- **Cities accommodate ~31% of India's current population and contribute 63% to the GDP (Census 2011). By 2030, urban areas are expected to accommodate 40% of India's population and contribute 75% to the GDP.**

- Population growth in cities leads to infrastructure management and service delivery challenges. The Smart Cities Mission in India is an initiative that aims to efficiently and effectively tackle these challenges.

### About the Mission

- The Smart Cities Mission was launched in 2015.
- The main objective of the Mission is to **promote cities that provide core infrastructure, clean and sustainable environment and give a decent quality of life to their citizens** through the application of 'smart solutions'.



- The Mission aims to drive economic growth and improve quality of life through **comprehensive work on social, economic, physical and institutional pillars** of the city.
- The focus is on sustainable and inclusive development by creation

of **replicable models** which act as lighthouses to other aspiring cities.

### Coverage

- The mission will cover **100 cities** that have been **distributed among the States /Union Territories (UT)** on the basis of an **equitable criteria**.

- Each State/UT will have a certain number of potential Smart Cities, with **each State/UT having at least one.**

### Funding

- The Mission is operated as a **Centrally Sponsored Scheme.** The **Central Government** gives financial support on an average **Rs.100 crore per city per year.** An **equal amount on a matching basis** is to be provided by the **State/Urban Local Bodies (ULBs).**
- Additional resources are to be raised through **convergence**, from ULBs' own funds, grants under

Finance Commission, innovative finance mechanisms such as Municipal Bonds, other government programs and borrowings.

- Emphasis has been given on the **participation of the private sector through Public Private Partnerships (PPP).**

### What are Smart Cities?

- There is **no standard definition or template** of a smart city.
- In the context of our country, the **six fundamental principles** on which the concept of Smart Cities is based are:



### Implementation by Special Purpose Vehicle (SPV)

- The implementation of the Mission at the City level will be done by a **Special Purpose Vehicle (SPV)** created for the purpose. The SPV will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects.
- Each Smart City will have a SPV which will be headed by a **full time CEO** and have nominees of Central Government, State Government and ULB on its Board.
- The SPV will be a **limited company** incorporated under the **Companies Act, 2013** at the city-level, in which the **State/UT and the ULB** will be the promoters having **50:50 equity shareholding.**

### Why in News?

- The Centre has decided to extend the Smart Cities Mission deadline

by one year, from June 2023 to June 2024.

- The flagship mission, which involves development of 100 cities into smart cities, had an initial deadline of June 2021. This would be the second extension of the mission.

## 3) National Edible Oil Mission-Oil Palm

### About Oil Palm

- Oil Palm (*Elaeis guineensis*), **originated from West Africa** is comparatively a new crop in India and has **highest vegetable oil yielding capability per ha.**
- It produces two distinct oils, i.e. **palm oil** and **palm kernel oil**, which are used for culinary as well as industrial purposes.
- The Oil Palm grows best in areas with a **mean maximum temperature of 30-32°C** and on an

**average of at least five hours of sunlight.** Oil palm is a humid crop and requires a **well distributed rainfall of 200 cm per annum.**

- The adult palms can withstand occasional water logging, but frequent water logged, extremely sandy and hard lateritic soils should be avoided. Best suited soils are **moist, well-drained, deep loamy alluvial soils, rich in organic matter with good water permeability.**

#### **Oil palm growing States**

- **Andhra Pradesh, Telangana and Kerala** are major Oil palm growing States and account **98% of total production.** Karnataka, Tamil Nadu, Odisha, Gujarat and Mizoram have also sizable areas under Oil palm cultivation.
- Recently, Arunachal Pradesh, Assam, Manipur and Nagaland have also initiated Oil palm plantation programs on a large scale.

#### **About NMEO-OP**

- In 2021, the Government of India launched the National Edible Oil Mission-Oil Palm (NMEO-OP) to **boost domestic oilseed production and make the country self-sufficient in cooking oils.**
- Under the mission, the government aims to **increase the oil palm production area to 10 lakh ha., and boost the Crude Palm Oil production to 11.20 lakh tonnes by 2025-26.**
- With **palm oil having 55 per cent share in total edible oil imports,** NMEO-OP would ensure that farmers get all facilities, from quality seeds to technology to promote cultivation of palm and other oil seeds.
- The strategy to implement the NMEO-OP will include increasing production of seedlings by

establishment of seed garden, nurseries of oil palm to assure domestic availability of seedlings.

#### **Funding Pattern**

- NMEO-OP is a **Centrally Sponsored Scheme** and the cost will be shared as **60:40** between the Central and the State Government for General states and **90:10** for NE states and **100%** for UTs and for central agencies.

#### **Significance**

- While India has become self-sufficient or Aatamnirbhar in the production of rice, wheat and sugar, it was not enough as the country is **dependent on huge imports of edible oils.**
- India is the **world's biggest vegetable oil importer.** India **produces less than half of the roughly 2.5 million tonnes of edible oil that it consumes annually.**
- It imports the rest, buying **palm oil from Indonesia and Malaysia, soyoil from Brazil and Argentina, and sunflower oil, mainly from Russia and Ukraine,** with the import bill hovering around Rs 75,000 crore per year.
- The increase in cultivation of oil palm will not only benefit farmers but also consumers who would get quality cooking oils at a cheaper rate.
- Besides, it would benefit processors and the entire value chain, thereby creating job opportunities.

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

- The Government of India, along with the State Governments, have initiated a Mega Oil Palm Plantation drive under the NMEO-OP to further increase the oil palm cultivation in the country.

## 4) E-Shram Portal

### About the Portal

- In 2021, the **Ministry of Labour and Employment** unveiled the e-shram portal to **register 38 crore unorganised workers**, such as construction labourers, migrant workforce, street vendors and domestic workers, among others.
- The workers will be issued an **e-Shram card containing a 12 digit unique number**. This is a **permanent number** and valid for lifetime.
- The portal would lead to the creation of a **national database of unorganised workers**. In future, it is envisaged that **all the social security benefits** to unorganized workers will be delivered through this portal. In **emergency and national pandemic like situations**, this database may be utilized to provide necessary assistance to the eligible unorganized workers.
- Apart from being **Aadhaar-linked**, it will collect details of the name, occupation, address, educational

qualification, skill types and family of the registered workers.

- The portal was developed by the Ministry of Labour & Employment, in technical collaboration with the **National Informatics Centre** (an attached office under the Ministry of Electronics and Information Technology).
- The portal is open to workers engaged in the **unorganised sector** and **aged between 16 and 59**.

### Why in News?

- Over 28.96 crore unorganised workers have registered on eShram portal.
- eShram portal captures details of workers such as name, permanent address, current address, occupation, educational qualification, skill type etc.

# Environment

## 1) Marine Heatwaves

### About Marine Heatwaves

- **Marine heatwaves** are periods of “**extremely high temperatures**” in the **ocean**.
- Marine heatwaves can occur in **summer** or **winter** and they are defined based on differences with expected temperatures for the location and time of year.
- Marine heatwaves occur when **Sea surface temperatures (SST)** exceed **90%** for **five days** in a row, from the **previous SST observations** recorded at the same time in the **last 30 years**.

### Causes for the formation of marine heatwaves

- Factors such as **increased warming** and **weak winds** contribute to its formation;
- **Ocean currents** can build up areas of warm water;
- **Air-sea heat flux** or warming through the ocean surface from the atmosphere;
- Climate phenomena like **El Niño** can cause marine heat waves.

### Why in news?

- A recent study revealed that marine heat waves could result in the deaths of several species, coral bleaching, and more intense storms in the years to come.

### Recent findings

- With a rise in **global temperatures**, ocean temperatures have remained at record-high levels, giving rise to **marine heat waves (MHWs)** around the globe.
- The **National Oceanic and Atmospheric Administration (NOAA)** has stated that around **40 percent** of **global oceans** were **already experiencing marine heatwave conditions**.

### Impact of marine heatwaves

- Marine heatwaves can **increase** the incidence of **tropical cyclones** and **hurricanes**.
- Marine heat waves affect **ecosystem structure** and drastically affect **Biodiversity**.
- **Mass mortalities of aquatic flora** and **fauna** can occur.
- **Economic losses** occur due to the loss of economically important species.
- Marine heat waves, also fuel the **growth of invasive alien species**, which can be destructive to marine food webs.
- These events are linked to **coral bleaching**, **fishkills**, **seagrass destruction**, and **loss of kelp forests**, affecting the fisheries sector adversely.

## 2) Ambergris

### What is ambergris?

- Ambergris is a substance that originates from the **digestive system** of **sperm whales** and is often referred to as “**floating gold**”.
- It is a **waxy, grayish substance** that is produced in the **intestines** of whales to protect their stomachs from **sharp objects** like squid beaks, which are part of their diet.
- Over time, layers of this waxy material accumulate and solidify into lumps.

### How is it formed?

- The process of ambergris formation involves a **complex chemical reaction** within the whale's digestive system.
- Once it has formed, the whale may expel the ambergris through its feces or vomit it out.
- The ambergris then floats on the ocean's surface and can be found

washed up on beaches or collected from the water.

- Ambergris is produced only by an estimated **1% of sperm whales** only.

### Uses of Ambergris

- **Perfumes and Fragrances:** One of the most well-known and traditional uses of ambergris is as an ingredient in perfumes and fragrances. Its complex, long-lasting scent can enhance and stabilize other aromatic compounds in perfumes.
- **Aromatherapy:** Ambergris has been used in aromatherapy for its unique and relaxing scent.
- **Traditional Medicine:** In some cultures, ambergris has been used in traditional medicine for various purposes, such as treating ailments related to the digestive system or as an aphrodisiac.
- **Culinary Uses:** In the past, ambergris was occasionally used as a flavoring agent in culinary recipes, particularly in high-end dishes.

### Smuggling of Ambergris

- Natural ambergris is relatively rare and due to its **high value** it is frequently **smuggled**.
- There have been several cases where the **coastline of Gujarat** has been used for such smuggling.
- Since the sperm whale is a **protected species**, hunting the whale is not allowed, but smugglers have resorted to unfair means to trap sperm whales.

### Why in News?

- Mysuru police recently arrested three men from for trafficking highly-valued ambergris.

### Related Information

#### Sperm whales

- **Sperm whales** are the **largest toothed whales** and are known for

their **massive heads** and distinctive appearance.

- Sperm whales are found in oceans around the world, from **cold polar waters** to **tropical** and **subtropical regions**.
- Sperm whales are known to live in **social groups** known as **Pods**. These pods are usually composed of **females** and their **offspring**.
- Adult males often live a more **solitary existence** or form smaller bachelor groups.
- Sperm whales use **echolocation** for identifying **prey**.
- Threats to these species include **marine pollution**, **noise pollution**, and **climate change**.
- Sperm whales are declared **vulnerable** in IUCN red list. They are also protected under **Appendix I of CITES**.

## 3) Commission for Air Quality Management in NCR

### Background

- The **Commission for Air Quality Management in the National Capital Region and Adjoining Areas Act, 2021**, was passed by the Parliament in 2021.

### What is the Act all about?

- The monitoring and management of air quality in the Delhi-NCR region has been done in pieces by multiple bodies, including the Central Pollution Control Board (CPCB), the state pollution control boards, the state governments in the region, including Delhi, Haryana, Uttar Pradesh, and Rajasthan, and the Environment Pollution (Prevention and Control) Authority (EPCA) of the National Capital Region.
- They, in turn, are monitored by the **Union Ministry of Environment and Forests and Climate Change (MoEF)**, and the **Supreme Court**

which monitors air pollution as per the judgment in '**M C Mehta vs Union of India**' case in 1988.

- The Act, however, seeks to create an overarching body - **Commission for Air Quality Management in National Capital Region and Adjoining Areas** - to consolidate all monitoring bodies, and to bring them on one platform so that air quality management can be carried out in a more comprehensive, efficient, and time-bound manner.
- The Centre also seeks to **relieve the Supreme Court from having to constantly monitor pollution levels through various cases.**

#### Overarching Body

- Apart from consolidating all agencies that monitored, investigated and planned mitigation of air pollution in the region, the commission has **replaced the Supreme Court-appointed Environment Pollution (Prevention and Control) Authority (EPCA).**
- Over the years, the EPCA's powers had been waning. While dissolving the body, the Centre felt that the EPCA had become redundant and had been ineffective in addressing issues related to air pollution. The EPCA also **did not have penal provisions that the commission will now have.**

#### What are the powers of the commission?

- The Commission is the **most powerful air pollution monitoring body set up by the Centre to date.** The rulings by the commission on air pollution will **override anything contained in any other law.**
- The powers of the commission will also **supersede that of any other body in matters of air pollution.** Therefore, in cases where conflict

may arise between orders or directions issued by the other state governments, state pollution control boards or even the Central Pollution Control Board, the **orders of the commission will prevail.**

- The Commission will have the power to **take measures, issue directions and entertain complaints "for the purpose of protecting and improving the quality of air in the National Capital Region".**
- It will also coordinate action taken by states on air pollution and will lay down parameters for air quality and emission or discharge of environmental pollutants. It will also have **powers to restrict industries** in any area, **carry out random inspections** of any premises including factories and be able to **close down an industry or cut its power and water supply** in case of non-compliance.
- It will also be **monitoring the measures taken by the states to prevent stubble burning.**

#### What will be the composition of the commission?

- The Commission will be headed by a **full-time chairperson** with experience of not less than 15 years in the field of environmental protection and pollution control or having administrative experience of not less than 25 years.
- The commission will also have **three members**, being stakeholders from sectors such as agriculture, industry, transport or construction apart from representatives of several ministries.
- The Chairperson and members of the Commission will have a tenure of **three years or till the age of seventy years**, whichever is

earlier, and shall be eligible for re-appointment.

- The Act further says that **no civil court** will have jurisdiction to entertain any suit, proceeding or dispute pertaining to or arising out of the actions taken or directions issued by the commission and that **orders of the commission can only be contested before the National Green Tribunal.**

#### Why in News?

- The Commission for Air Quality Management has announced various measures to effectively tackle the menace of air pollution across the National Capital Region (NCR).

### 4) Atal Bhujal Yojana

#### About the Scheme

- Atal Bhujal Yojana (Atal Jal) is a **Central Sector Scheme** with focus on **community participation and demand side interventions for sustainable groundwater management in identified water stressed areas of seven States** in the country viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.
- The scheme, partly funded by the **World Bank**, is being implemented from **2020** for a period of 5 years.
- It envisages **people's participation** through the formation of water budgeting, preparation & implementation of Gram-panchayat-wise water security plans, etc.
- The scheme also envisages **sustainable groundwater management**, mainly through convergence among various on-going schemes, with emphasis on demand side measures through

active involvement of local communities and stakeholders.

- It is being implemented by the **Ministry of Jal Shakti.**

#### Why in News?

- Atal Bhujal Yojana is being implemented in water stressed Gram Panchayats (GPs) of 229 administrative Blocks/ Talukas in 80 districts of 7 States, viz., Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

### 5) National Action Plan on Climate Change

#### About NAPCC

- The National Action Plan on Climate Change (NAPCC) was formally launched in **2008**.
- There are **eight "National Missions"** which form the core of the National action plan. They focus on promoting understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation.
- The NAPCC provides the **overarching policy framework for climate change mitigation and adaptation** through its National Missions. The NAPCC represents **multipronged, long term and integrated strategies** for achieving key goals in the context of climate change.

#### Missions under the NAPCC

##### 1. National Solar Mission

- This initiative was started to promote the use of solar power.
- The Mission has set the ambitious target of deploying **100 GW** of grid connected solar power by 2022. It is under the **Ministry of New and Renewable Energy.**

##### 2. National Mission for Enhanced Energy Efficiency



- The initiative was undertaken to promote the market for energy efficiency by fostering innovative policies and effective market instruments.
- Implementation agencies of the Mission- **BEE - Bureau of Energy Efficiency & EESL - Energy Efficiency Services Limited.**
  - *Bureau of Energy Efficiency is a **statutory body** under the **Ministry of Power** set up under the provisions of the **Energy Conservation Act, 2001.** It is responsible for spearheading the improvement of energy efficiency in the economy through various regulatory and promotional instruments.*
  - *Energy Efficiency Services Limited is a **joint venture of PSUs under the Ministry of Power.** It was set up in 2009 to facilitate energy efficiency projects.*

### **3. National Mission on Sustainable Habitat**

- It aims to make cities sustainable through improvements in energy efficiency in buildings, management of solid waste and shift to public transport.
- The **Ministry of Housing and Urban Affairs** backs the mission.

### **4. National Mission for Sustaining the Himalayan Ecosystem**

- Aimed at protecting the Himalayas, it has mapped institutes and civil society organisations working on the Himalayan ecology for ease of coordination between governmental and non-governmental agencies.
- It is the **only area-specific mission** under the NAPCC.

- The **Ministry of Science and Technology** has been entrusted with the responsibility of coordinating the mission.

### **5. National Mission for a Green India**

- It aims at protecting, restoring and enhancing India's diminishing forest cover and responding to climate change by a combination of adaptation and mitigation measures.
- The target under the Mission is **10 million hectares (mha) on forest and non-forest lands** for increasing the forest/tree cover and to improve the quality of existing forest.
- It is driven by the **Ministry of Environment, Forest & Climate Change (MoEFCC).**

### **6. National Mission for Sustainable Agriculture**

- It has been formulated for enhancing agricultural productivity especially in rain-fed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation.

### **7. National Mission on Strategic Knowledge for Climate Change**

- The mission seeks to build a dynamic and vibrant knowledge system that informs and supports national policy and action for responding effectively to climate change challenges, while not compromising on the nation's growth goals.
- The **Ministry of Science and Technology** drives the mission.

### **8. National Water Mission**

- The main objective of NWM is conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within states through

integrated water resources development and management.

- At present, it is driven by the **Ministry of Jal Shakti**.

#### Why in News?

- National Mission for a Green India (GIM) is one of the eight Missions under the National Action Plan on Climate Change.
- Based on the perspective plans submitted by the States and as per the availability of funds, so far seventeen states and one union territory have been taken up under GIM.

## 6) Human shield effect

### About the human shield effect

- In recent decades, increasing **urbanization** has led to ever more **non-domesticated animals living in closer proximity to humans**.
- **Mesopredators**, which include medium-sized carnivorous species, tend to **move into human-dominated areas to avoid predation by larger carnivores**. This is known as the **human shield effect**.
- The human shield effect has been observed in a variety of animals, including **samango monkeys, zebras, and moose**.
- Although this behavior of mesopredators leads to a **reduction in mortality from large predators, it increases mortality from human activity**.
- Humans can present many dangers, intentional and unintentional, which include poaching, trapping, and destruction of habitat.

#### Why in News?

- A recent study revealed that the human-shield effect can be lethal to mesopredators because of increasing threats posed by anthropogenic activities.

- Researchers explained that mesopredator behavior is **antithetical** because the behavior which leads to a reduction in mortality from large predators increases mortality from human activity.

### Related Information

#### Mesopredators

- Mesopredators are a **group of animals that occupy the middle level in the food chain, between top predators and their prey**.
- They are typically **medium-sized carnivores** that feed on smaller animals but are themselves preyed upon by larger predators.
- They play an **important role in regulating the populations of their prey species and can have cascading effects on ecosystem dynamics**.
- Mesopredators include foxes, raccoons, coyotes, skunks, etc.

## 7) Thawing permafrost in the Arctic

### Permafrost

- Permafrost is essentially **any ground that stays frozen, 0 degree Celsius or lower, for at least two years straight**.
- These permanently frozen grounds are often found in **Arctic regions such as Greenland, Alaska (the United States), Canada, Russia and Eastern Europe**.
- According to NASA, permafrost is composed of a **combination of soil, rocks and sand that are held together by ice**. The soil and ice in permafrost stay **frozen all year long**.

### Permafrost Thawing

- As Earth's climate **warms**, the permafrost is **thawing**. That means the **ice inside the permafrost melts, leaving behind water and soil**.

- Thawing permafrost can have **dramatic impacts** on our planet and the things living on it.



### Why in News?

- According to a study, **thawing of permafrost in the Arctic region could result in the spread of toxic substances in the arctic region.**
- The study noted that the **Arctic is getting warmer nearly four times as fast as the rest of the planet due to climate change.** As a result, **permafrost is thawing rapidly, which could destabilise not only the industrial sites but also the contaminated areas.**
- And once the destabilisation takes place, toxic substances would be unleashed across the region, threatening numerous species living there and the health of people who depend on them.
- According to the study, as of now, around 1,000 of the known industrial sites and 2,200 to 4,800 of the known contaminated sites are already at risk of destabilising due to thawing permafrost.

### What are the other consequences of thawing permafrost?

- Thawing permafrost can severely impact the planet. One of its most dangerous consequences is the **release of greenhouse gases into the atmosphere.**
- Arctic permafrost alone holds an estimated 1,700 billion metric tons

of carbon, including methane and carbon dioxide. That's roughly **51 times the amount of carbon the world released as fossil fuel emissions in 2019.**

- Plant matter frozen in permafrost doesn't decay, but when permafrost thaws, **microbes within the dead plant material start to break the matter down, releasing carbon into the atmosphere.**
- A 2022 study by Columbia University observed that thawing permafrost would **unleash thousands of dormant viruses and bacteria.** Some of these could be new viruses or ancient ones for which humans lack immunity and cures, or diseases that society has eliminated, such as smallpox or Bubonic plague.

## 8) Life in ocean 'twilight zone' at risk from warming

### Twilight zone

- The ocean twilight zone is a **layer of water that stretches around the globe.** It lies **200 to 1,000 meters (about 650 to 3,300 feet) below the ocean surface.**
- Also known as the **midwater or mesopelagic**, the twilight zone is **cold and its light is dim.**
- **Life in the twilight zone** includes microscopic bacteria and tiny animals known as zooplankton, along with larger crustaceans, fish, squid, and many kinds of gelatinous animals.

### Adaptations exhibited by Twilight zone animals

- To survive in such a low-light environment, many twilight-zone species, **produce their own light** through a **biochemical process** known as **bioluminescence.**
- Predatory fish also use bioluminescence to attract prey to

catch and eat. Some, for example, have a bioluminescent organ called an **esca** to tempt potential prey.

#### Importance of the ocean twilight zone

- The ocean twilight zone provides **important ecosystem services**, including supporting ocean food webs and commercial fisheries.
- Dead animals, clumps of dead plankton, bacteria, fecal pellets, and other particles rich in organic carbon sink from surface waters through the twilight zone to the deep ocean, providing food for twilight-zone animals.
- Satellite tagging has revealed that whales, tuna, swordfish, sharks, and other top predators dive deep down into the twilight zone to feed. Since humans value those predators for their ecological, commercial, and nutritional benefits, we **indirectly depend on the twilight zone.**

#### How does twilight zone help keep carbon dioxide outside the atmosphere?

- The twilight zone plays an important role in **transferring carbon from surface water to the deep ocean**, preventing it from returning into the air as a heat-trapping greenhouse gas.
- The multistep process is often called the ocean's "**biological pump.**"
- In surface waters where there is plenty of light, tiny plantlike organisms called **phytoplankton** use energy from the sun to transform carbon dioxide into the

energy and matter that allows them to grow.

- Phytoplankton, in turn, become food for small animals known as **zooplankton**, which are then eaten by fish and other animals.
- Some of the carbon in surface waters becomes part of a kind of underwater blizzard known as **marine snow.**
- That "snow," consists of clumps of dead plankton, bacteria, fecal pellets, and other particles rich in organic carbon, which provide **food for twilight-zone animals.**
- Another fast track for carbon into deeper water is through the **daily migration of twilight zone animals** that feed near the surface at night then bring the carbon in their food back down into the twilight zone during the day.
- About 90 percent of the carbon that gets into the twilight zone remains there, but a small percentage of it sinks to down into the deep ocean. Once there, it can remain isolated from the atmosphere for hundreds or even thousands of years.

#### Why in News?

- According to a new research, global warming could curtail life in the twilight zone by as much as 40% by the end of the century.

# Agriculture

## 1) Fair and Remunerative Price

### About FRP Mechanism

- Fair and Remunerative Price (FRP) is an arrangement for the **price to be paid to sugarcane farmers by the Sugar Mills**.
- It is announced each year by the Centre, on the advice of the **Commission for Agricultural Costs and Prices (CACP)** and after consultation with State Governments.
  - *CACP is an attached office of the Ministry of Agriculture and Farmers Welfare.*
- The system **assures margins on account of profit and risk to farmers**, irrespective of the fact whether sugar mills generate profit or not and is not dependent on the performance of any individual sugar mill.
- Under the FRP system, the price paid to farmers for sugarcane is **not linked to the profits** generated by sugar mills. Instead, **FRP is based on the recovery rate of sugar from sugarcane**.
- In order to ensure that higher sugar recoveries are adequately rewarded and considering variations amongst sugar mills, the **FRP is linked to a basic recovery rate of sugar**, with a **premium payable to farmers for higher recoveries of sugar from sugarcane**.

### What is the State Advised Price?

- State Advised Price or SAP is the price **announced by the state government, over and above the FRP**.
- Since sugar pricing comes under the **concurrent list**, both the centre and the state have the power to fix sugarcane prices — while the centre's price is the

minimum price, states can set an SAP that is **usually higher than the centre's FRP**.

### Why in News?

- The Cabinet Committee on Economic Affairs chaired by the Prime Minister has approved Fair and Remunerative Price (FRP) of sugarcane for sugar season 2023-24 (October - September) at Rs.315/ql for a basic recovery rate of 10.25%.
- It has also been approved to provide a premium of Rs.3.07/ql for each 0.1% increase in recovery over and above 10.25%, & reduction in FRP by Rs.3.07/ql for every 0.1% decrease in recovery.

## 2) Soil Health Card

### About SHC

- The Soil Health Card (SHC) scheme is promoted by the **Ministry of Agriculture and Farmers' Welfare** to provide information to farmers on **nutrient status of their soil** along with **recommendations on appropriate dosage of nutrients** to be applied for improving soil health and its fertility.
- Launched in 2015, it is being **implemented through the Department of Agriculture of all the State and Union Territory Governments**.

### Constituents of a Soil Health Card

- SHC is a printed report that a farmer will be handed over for each of his holdings.
- It will contain the status of his soil with respect to **12 parameters**, namely N, P, K (**Macronutrients**); S (**Secondary- nutrient**); Zn, Fe, Cu, Mn, Bo (**Micronutrients**); and pH, EC, OC (**Physical parameters**).

**N - Nitrogen , P - Phosphorus, K - Potassium, S - Sulphur, Zn - Zinc, Fe - Iron,  
Cu - Copper, Mn - Manganese, Bo - Boron, pH - potential of hydrogen, EC - Electrical Conductivity, OC - Organic Carbon.**

SOIL HEALTH CARD			Name of Laboratory				
<b>Farmer's Details</b>			<b>SOIL TEST RESULTS</b>				
Name			S. No.	Parameter	Test Value	Unit	Rating
Address			1	pH			
Village			2	EC			
Sub-District			3	Organic Carbon (OC)			
District			4	Available Nitrogen (N)			
PIN			5	Available Phosphorus (P)			
Aadhaar Number			6	Available Potassium (K)			
Mobile Number			7	Available Sulphur (S)			
<b>Soil Sample Details</b>			8	Available Zinc (Zn)			
Soil Sample Number			9	Available Boron (B)			
Sample Collected on			10	Available Iron (Fe)			
Survey No.			11	Available Manganese (Mn)			
Khasra No. / Dag No.			12	Available Copper (Cu)			
Farm Size							
Geo Position (GPS)	Latitude:	Longitude:					
Irrigated / Rainfed							

Secondary & Micro Nutrients Recommendations		
Sl. No.	Parameter	Recommendations for Soil Applications
1	Sulphur (S)	
2	Zinc (Zn)	
3	Boron (B)	
4	Iron (Fe)	
5	Manganese (Mn)	
6	Copper (Cu)	
General Recommendations		
1	Organic Manure	
2	Biofertiliser	
3	Lime / Gypsum	
International Year of Soils 2015		Healthy Soils for a Healthy Life

Fertilizer Recommendations for Reference Yield (with Organic Manure)				
Sl. No.	Crop & Variety	Reference Yield	Fertilizer Combination-1 for N P K	Fertilizer Combination-2 for N P K
1	Paddy (Dhaan)			
2				
3				
4				
5				
6				

- SHC will be made available once in a **cycle of 3 years**, which will indicate the status of soil health of a farmer's holding for that particular period.
- The SHC will also **indicate fertilizer recommendations and soil amendment required for the farm.**

### Benefits of Soil Health Card

- Soil Health Card help the farmers in the following ways:
  - The report generated through soil health card scheme encourages **judicious and balanced use of fertilizers.**

- The report card also suggests **use of bio fertilizers, micronutrients and organic manures to increase soil fertility.**
- Farmers training and demonstrations on farmers fields, under the scheme creates **awareness among the farmers to increase soil fertility.**
- The SHC will monitor the soil of the farmers well and will give them a formatted report. So, they can **decide well which crops they should**

**cultivate and which ones they should skip.**

v. The authorities will **monitor the soil on a regular basis**. So, farmers need not worry if the nature of the soil changes due to certain factors and also they will always have updated data about their soil.

vi. Apart from listing down measures required to improve the quality of the soil, experts are also employed to help farmers in carrying out the **corrective measures**.

### Why in News?

- The Government of India has made some technological interventions in the Soil Health Card Scheme. The Soil Health Card portal has been **revamped and integrated with a Geographic Information System (GIS) system** so that all the test results are captured and seen on a map.
- To make the implementation/monitoring of the scheme smooth and to facilitate farmers an easy access to his soil health card, the **mobile application** has been made robust with several **additional features**.

## Flora & Fauna

### 1) Global Gibbon Network

#### Gibbons

- Gibbons are a group of **small to medium-sized apes**. They are the smallest and **fastest** of all apes.
- Gibbons are found in the dense forests of **Southeast Asia**, including countries like **Thailand, Indonesia, Malaysia, Laos, and Vietnam**.
- Unlike some other primates, **gibbons lack a tail**.
- Gibbons are known for their **energetic vocal displays**. They are **omnivorous** in their diet and are **arboreal creatures** (tree-dwelling).



#### Types of Gibbons Found in India

- Hoolock gibbons are the **only apes found in India**.
- It was widely considered that India has two species of Gibbons: the **Western Hoolock Gibbon** (*Hoolock hoolock*) and the **Eastern Hoolock Gibbon** (*Hoolock leuconedys*).
  - **Western Hoolock Gibbon:** It is found in the **northeastern states of India**, including Assam, Arunachal Pradesh, and Meghalaya. Western Hoolock gibbons have a **white or pale browband**, distinguishing them from Eastern Hoolock gibbons.

- **Eastern Hoolock Gibbon:** Also found in **northeastern India**, particularly in Arunachal Pradesh and Nagaland. Eastern Hoolock gibbons have a distinct **dark browband**.

- However, a study conducted by the **Centre for Cellular and Molecular Biology (CCMB)** in 2021 proved that **Hoolock gibbon (Hoolock hoolock) is the only gibbon found in India**.
- Genetic analysis of the study noted that there is no separate species of eastern hoolock gibbon in northeast India, debunking earlier research that had suggested a separate species (the assumed eastern hoolock gibbon) based on coat colour.

#### Threats

- **Habitat Loss and Fragmentation:** One of the primary threats to gibbons is habitat loss due to deforestation, agriculture, logging, and urban expansion.
- **Illegal Wildlife Trade:** Gibbons are sometimes captured and sold for their body parts, which are used in traditional medicine or for ornamental purposes.
- **Infrastructure Development:** The construction of roads, dams, and other infrastructure projects can fragment gibbon habitats, disrupt their movement patterns, and increase the risk of accidental deaths due to collisions with vehicles.

#### Why in News?

- Recently, the first meeting of the Global Gibbon Network (GGN) to save the Hoolock gibbon was held in the Hainan province of China.

#### About Global Gibbon Network (GGN)



- It is a **voluntary global platform** to safeguard and conserve gibbons and their habitats, by promoting participatory conservation policies, legislations, and actions.
- GGN was first initiated in **2020**.

# Economy

## 1) Internationalisation of Rupee

### Context

- Pushing for a **roadmap** towards the internationalisation of the rupee, the **Reserve Bank of India's (RBI) inter-departmental group (IDG)** said with India remaining one of the fastest-growing countries and showing remarkable resilience in the face of major headwinds, the **rupee has the potential to become an internationalised currency.**

### What does internationalisation of the rupee mean?

- Internationalisation is a process that involves **increasing the use of the rupee in cross-border transactions.**
- It involves promoting the rupee for **import and export trade** and then **other current account transactions**, followed by its use in **capital account transactions.**
- The internationalisation of the currency, which is closely interlinked with the nation's economic progress, requires **further opening up of the currency settlement and a strong swap and forex market.**
- More importantly, it will require **full convertibility of the currency on the capital account** and cross-border transfer of funds without any restrictions. India has allowed only partial capital account convertibility.

### The relevance

- Currently, **the US dollar** is said to enjoy an **'Exorbitant Privilege'**, which refers to the innumerable benefits that accrue to the US on account of all other countries of the world using the US dollar as their currency in most of their

international transactions, among global currencies.

- The dollar's position is supported by a **range of factors**, including the size of the US economy, the reach of its trade and financial networks, the depth and liquidity of US financial markets, and a history of macroeconomic stability and currency convertibility. Dollar dominance has also benefited from the lack of viable alternatives.
- In the wake of the **sanctions imposed on the Russian government**, its public sector and even individuals linked to the government, many countries have become cautious of the price they may have to pay if they are subjected to similar sanctions by the Western governments. China, Russia and a few other countries have become **more vocal in questioning the US dollar-dominated global currency system.**
- They would like to **reduce their reliance on the US dollar and its financial markets.**
- The RBI-appointed group feels that it is **imperative for India to continue exploring alternatives to both the USD and the Euro.**

### Advantages of internationalisation of the rupee

- The use of the rupee in cross-border transactions **mitigates currency risk for Indian businesses.** Protection from currency volatility not only **reduces the cost of doing business**, it also enables **better growth of business, improving the chances for Indian businesses to grow globally.**
- While **reserves** help manage exchange rate volatility and project

external stability, they **impose a cost on the economy**. Internationalisation of the rupee **reduces the need for holding foreign exchange reserves**. Reducing dependence on foreign currency will **make India less vulnerable to external shocks**.

- As the use of the rupee becomes significant, the **bargaining power of Indian businesses would improve**, adding weight to the Indian economy and **enhancing India's global stature and respect**.

### Recommendations

- The RBI's working group has recommended a slew of short to long term measures to accelerate the pace of internationalisation of the rupee.
- For the short term, the group has suggested **opening of the rupee accounts for non-residents** both in India and outside India and **integrating Indian payment systems with other countries** for cross-border transactions.
- Over the next two to five years, the group has recommended a **review of taxes on masala bonds** (rupee-denominated bonds issued outside India by Indian entities), **international use of Real Time Gross Settlement (RTGS) for cross-border trade transactions** and **inclusion of Indian Government Bonds in global bond indices**.
  - *RTGS is a system where the funds transfer requests from one savings account to another are processed in real-time, i.e., as soon as they are received from the remitting bank. It was launched by the RBI.*
- For the long term, the group has recommended that efforts should

be made for the **inclusion of the rupee in IMF's Special Drawing Rights (SDR)**.

- *The SDR is an international reserve asset created by the IMF to supplement the official reserves of its member countries. The value of the SDR is based on a basket of five currencies — the U.S. dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling.*

## 2) GIFT City

### About IFSC

- An International Financial Services Centre (IFSC) is a jurisdiction that provides **world class financial services to non-residents and residents** in a currency other than the domestic currency (Indian Rupee) of the location where the IFSC is located.
- **Services provided by an IFSC:**
  - Fund-raising services for individuals, corporations and governments
  - Asset management and global portfolio diversification undertaken by pension funds, insurance companies and mutual funds
  - Wealth management
  - Merger and acquisition activities among trans-national corporations, etc.

### GIFT City

- India's 1st IFSC has been set up at the **Gujarat International Finance Tec-City (GIFT City) in Gandhinagar**.
- Operationalized in 2015, it is intended to **provide Indian corporates with easier access to global financial markets, and to complement and promote the**

### **further development of financial markets in India.**

- It seeks to bring back the financial services and transactions that are currently carried out in offshore financial centers by Indian corporate entities and overseas branches / subsidiaries of financial institutions (FIs) to India by offering a business and regulatory environment that is comparable to other leading international financial centers in the world like London and Singapore.
  - *The **International Financial Services Centres Authority (IFSCA)** was established in 2020 as a unified authority for the development and regulations of IFSCs in India.*

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

- The Government of India has announced that Indian companies can now list their shares on foreign exchanges operating at GIFT City-based International Financial Services Centre (IFSC) in Gujarat.
- This is a major step forward to enable Indian companies to access global capital at better valuations.

### **3) Instant settlement of trades in the works**

#### **Context**

- The securities market regulator SEBI has said it is working on **real-time settlement of transactions in India's stock exchanges.**
- The announcement came after the regulator **shortened the settlement cycle to trade-plus-one (T+1) from T+2.**

#### **What is meant by trade settlement?**

- 'Settlement' is a **two-way process that involves the transfer of funds and securities on the settlement date.** As of now, there is a **lag between trade and**

**settlement** — the settlement date is different from the trade date.

- A trade settlement is said to be **complete once purchased securities of a listed company are delivered to the buyer, and the seller gets the money.**
- The current cycle of '**T+1**' in India means trade-related settlements happen **within a day, or within 24 hours of the actual transaction.** The migration to the T+1 cycle came into effect in **January** this year.
- India became the **second country** to start the T+1 settlement cycle in top listed securities after **China**, bringing operational efficiency, faster fund remittances, share delivery, and ease for stock market participants.

#### **What has SEBI announced now?**

- SEBI has said it is working on a plan for "**instantaneous settlement of trades in the securities market.**"
- **Same-day, or 'T+0'**, settlement of trades will be possible with the real-time payment system — Unified Payments Interface (UPI), online depositories, and technology stack.

#### **What will change for investors with T+0?**

- Under the current T+1 settlement cycle, if an investor sells securities, the **money gets credited into her account the following day.** Under the T+0 settlement cycle, if investors sell shares, they will **get the money in their account instantaneously, and the buyers will get the shares in their demat accounts the same day.**

## 4) U.S. Federal Reserve Rate Hike

### Context

- **The US Federal Reserve has raised its lending rate by 25 bps to 5.25-5.5%.** This brings US benchmark interest rates to the highest level since 2001 to tackle high inflation.
- The latest quarter percentage-point rise is the Fed's 11th since it began an aggressive campaign of monetary tightening last March in response to rising prices.

### Impacts

- **Emerging economies** such as India tend to have **higher inflation** and, thereby, **higher interest rates** than those in developed countries such as the US and Europe. As a result, **Foreign Institutional Investors (FIIs)** would want to borrow money in the US at low interest rates in dollar terms, and then invest that money in bonds of emerging countries such as India in rupee terms to earn a higher rate of interest.
- When the US Fed increases its interest rates, the **difference between the interest rates of the two countries reduces** (known as **interest rate differential**), thus making India less attractive for foreign investors. It results in **Outflow of foreign investments from India and other emerging economies.**
- In the Indian context, net capital outflows influence the **shortage of dollar liquidity**, which result in **rupee depreciation.**
- RBI will therefore have to **raise interest rates in India** to prevent FII outflows from the Indian market.

## 5) ONDC

### About

- In 2022, the government of India launched the pilot phase of **open network for digital commerce (ONDC)** with an aim to **democratise the country's fast growing digital e-commerce space** that is currently dominated by the two U.S.-headquartered firms — Amazon and Walmart.

### What is ONDC?

- ONDC is a network based on open protocol and will **enable local commerce across segments**, such as mobility, grocery, food order and delivery, hotel booking and travel, among others, **to be discovered and engaged through a single platform.**
- It is an initiative of the **Department for Promotion of Industry and Internal Trade (DPIIT)** under the **Ministry of Commerce and Industry.**
- It is **neither an aggregator application nor a hosting platform**, and all existing digital commerce applications and platforms can voluntarily choose to adopt and be a part of the ONDC network.



### Role in Democratising Digital Commerce

- The ONDC platform aims to **create new opportunities, curb digital monopolies and support micro, small and medium enterprises and small traders** and help them get on online platforms.

- The ONDC aims to **enable buying of products from all participating e-commerce platforms by consumers through a single platform.**
- Currently, a buyer needs to go to Amazon website/app, for example, to buy a product from a seller on Amazon. Under ONDC, it is envisaged that a buyer registered on one participating e-commerce site (for example, Amazon) may purchase goods from a seller on another participating e-commerce site (for example, Flipkart).
- The ONDC model is trying to **replicate the success of the Unified Payments Interface (UPI)** in the field of digital payments.
  - *UPI allows people to send or receive money irrespective of the payment platforms they are registered on.*
- The open network concept also **extends beyond the retail sector, to any digital commerce domains including wholesale, mobility, food delivery, logistics, travel, urban services, etc.**

### Significance

- The government believes that ONDC will put an **end to the domination of the e-commerce market by a few large platforms.** Amazon and Flipkart, for instance, have been accused of discriminating among sellers on their platforms and promoting certain seller entities in which they hold indirect stakes.
- With an open network like ONDC that connects buyers and sellers across platforms, the government hopes to **level the playing field and make platforms redundant.**
- It is said that buyers will also be able to access sellers across platforms without having to switch between multiple platforms.

- Over the next five years, the ONDC expects to bring on board 90 crore users and 12 lakh sellers on the network.
- The ONDC will **standardise operations** like cataloguing, inventory management, order management and order fulfilment, **hence making it simpler and easier for small businesses to be discoverable over network and conduct business.**

### Challenges

- ONDC faces its own share of challenges and risks, which must be addressed. One of the pivotal challenges lies in ensuring the **adoption and acceptance of ONDC by the various stakeholders** within the e-commerce ecosystem.
- Another challenge is to **ensure the quality and reliability** of the services and products offered on the network. ONDC will have to **establish clear standards and guidelines** for quality assurance, consumer protection, data privacy, cybersecurity, etc.
- ONDC will also have to ensure **effective dispute resolution mechanisms** for handling complaints and grievances.
- ONDC will have to **ensure the sustainability and scalability** of the network to make sure that the network can **handle the increasing volume and variety of transactions and data.**

### Why in News?

- Currently, the network has more than 40,000 sellers spread across over 200 cities. The platform is currently offering more than 27 lakh products on its network.

## Organisations

### 1) Iran's induction in the SCO

#### What is the SCO?

- The Shanghai Cooperation Organisation (SCO) was built on the 'Shanghai Five' grouping of **Russia, China, Kazakhstan, Kyrgyzstan and Tajikistan**, which had come together in the post-Soviet era in 1996, in order to work on regional security, reduction of border troops, and terrorism. In 2001, the Shanghai Five inducted **Uzbekistan** into the group and named it the SCO.
- **India and Pakistan** joined the SCO as observers in 2005, and were admitted as **full members** in 2017.
- Afghanistan, Belarus and Mongolia enjoy Observer status in the SCO, while six other countries — Azerbaijan, Armenia, Cambodia, Nepal, Turkey and Sri Lanka — have Dialogue Partner status.
- The organisation has **two permanent bodies** — the **SCO Secretariat** based in **Beijing** and the **Executive Committee of the Regional Anti-Terrorist Structure** in **Tashkent**.
- The **Heads of State Council** is the supreme decision-making body in the SCO. It meets once a year and adopts decisions and guidelines on all important matters of the organisation.

#### What are the main goals of the SCO?

- The SCO describes its main goals as:
  - strengthening **mutual trust and neighbourliness** among the member states;
  - promoting their **effective cooperation** in politics, trade, economy, research and technology and culture

as well as in education, energy, transport, tourism, environmental protection, and other areas;

- making joint efforts to **maintain and ensure peace, security and stability** in the region; and
- moving towards the establishment of a **democratic, fair and rational new international political and economic order**.

#### Why in News?

- **Iran** has joined the Shanghai Cooperation Organisation as its ninth member.
- Iran has been an observer in the SCO since 2005, and almost after 15 years, its bid for full and permanent membership in the organisation was approved at the 2021 Summit in Dushanbe, Tajikistan.

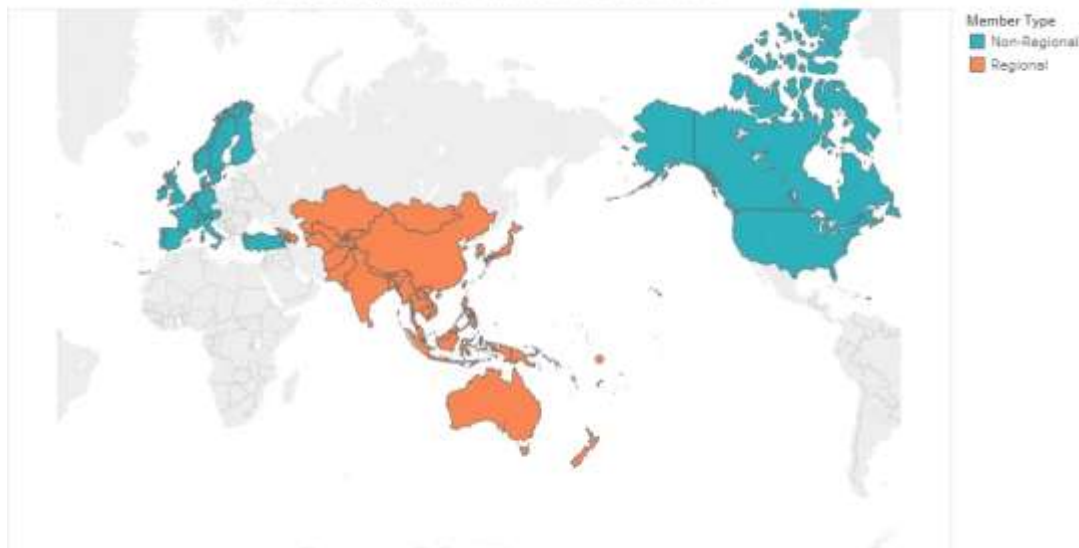
### 2) Asian Development Bank

#### About ADB

- The Asian Development Bank (ADB) was founded in **1966** with the primary mission of **fostering growth and cooperation among countries in the Asia-Pacific Region**.
- It is headquartered in **Manila, Philippines**.
- At present, ADB comprises 68 members (including **India**) - of which 49 are from within Asia and the Pacific and 19 outside.
- The ADB was **modeled closely on the World Bank**, and has a similar weighted voting system where votes are distributed in proportion with members' capital subscriptions.

- ADB's **five largest shareholders** are **Japan** and the **United States** (each with 15.6% of total shares), the **People's Republic of China** (6.4%), **India** (6.3%), and **Australia** (5.8%).
- ADB assists its members, and partners, by providing loans, technical assistance, grants, and equity investments to promote social and economic development.
- ADB is an official **United Nations Observer**.

Asian Development Bank Member Countries



### Why in News?

- The Government of India and the Asian Development Bank has signed a \$130 million loan to increase agricultural productivity, improve access to irrigation and promote horticulture agribusinesses to raise farmers' income in the state of Himachal Pradesh.

## 3) Asian Infrastructure Investment Bank

### About AIIB

- The Asian Infrastructure Investment Bank (AIIB) is an international development bank that provides **financing for infrastructure projects in Asia**.
- Headquartered in **Beijing**, it began operations in **2016**.
- It includes more than 100 members worldwide (**India** is a founder member of AIIB). AIIB consists of two classes of membership: **regional and non-regional members**.
- **China** is the largest shareholder with 26.6 per cent voting shares in the bank. **India** is the second largest shareholder with 7.6 per cent voting shares followed by **Russia** 6.0 per cent.
- In 2018, AIIB was granted **Permanent Observer status** in the deliberations of both the **United Nations General Assembly and the Economic and Social Council**, the two development-focused principal organs of the global body.





### Why in News?

- The Asian Infrastructure Investment Bank recently organised a seminar on Roadmap to Sustainable Cities.

## 4) NITI Aayog

### About

- The **National Institution for Transforming India**, also called **NITI Aayog**, was formed via a **resolution of the Union Cabinet on January 1, 2015**.
- It replaced the erstwhile **Planning Commission**.
- NITI Aayog is the **premier policy 'Think Tank' of the Government of India**, providing both **directional and policy inputs**.
- While designing strategic and long term policies and programmes for the Government of India, NITI Aayog also provides relevant technical advice to the Centre and States.
- NITI Aayog's entire gamut of activities can be divided into four main heads:
  - **Policy and Programme Framework**
  - **Cooperative Federalism**
  - **Monitoring and Evaluation**

- **Think Tank, and Knowledge and Innovation Hub.**

### Governing Council of NITI Aayog

- The Governing Council of NITI Aayog is **chaired by the Prime Minister** and comprises Chief Ministers of all the States and Union Territories with legislatures; Lt Governors of other Union Territories; Ex-Officio Members; Vice Chairperson; Full-time Members; Special Invitees and Chief Executive Officer.
- The Governing Council, which embodies the objectives of cooperative federalism, presents a platform to discuss inter-sectoral, inter-departmental and federal issues to accelerate the implementation of the national development agenda.

### Important reports released by NITI Aayog

- **Healthy States, Progressive India Report**
- **Composite Water Management Index**
- **SDG India Index**
- **North-Eastern Region District SDG Index**
- **Multidimensional Poverty Index**

- **Export Preparedness Index**
- **India Innovation Index**

#### Why in News?

- NITI Aayog recently convened a conference on the Green and Sustainable Growth Agenda for the Global Economy in New Delhi.
- The aim of this conference was to examine prospects and challenges for green and sustainable growth globally.

### 5) KABIL

#### About KABIL

- Khanij Bidesh India Ltd. is a **joint venture company of three Central Public Sector Enterprises** under **Ministry of Mines** namely, National Aluminium Company Ltd. (NALCO), Hindustan Copper Ltd. (HCL) and Mineral Exploration and Consultancy Ltd.

- The company was set up in **2019** with an objective to **identify and acquire overseas mineral assets of critical and strategic nature.**
- The strategic and other minerals are intended to be supplied primarily to India to meet the domestic requirement due to its none or meager availability in the country and giving a big push to Make in India.
- The Company is **focusing on two prime critical and strategic mineral** i.e. **Lithium and Cobalt** in the present context of the Indian economy and linking it with creation of supply chain ecosystem in the country.

#### Why in News?

- KABIL has initiated engagements with countries like Argentina, Australia etc. to acquire critical & strategic minerals assets.

# Science and Technology

## 1) Fast Radio Bursts

### What are they?

- Fast radio bursts (FRB) are **extremely bright radio pulses from distant galaxies that last for only a few milliseconds.**
- These brief and mysterious beacons have been spotted in various and distant parts of the universe, as well as in our own galaxy.
- FRBs are extraordinary events that **generate as much energy in a thousandth of a second as the Sun does in an entire year.**
- Locating where these blasts are coming from, and in particular, what galaxies they originate from, is important in determining what kinds of astronomical events trigger such intense flashes of energy.
- Nearly 1,000 FRBs have been identified since their first detection in 2007. However, their **origins are unknown and their appearance is highly unpredictable.**
- For this, studies are currently on gaseous matter and stars from the nearby galaxies hosting FRBs.

### Key characteristics and features of Fast Radio Bursts:

1. **Brief and Intense:** FRBs are **incredibly short-lived events**, typically lasting only a few milliseconds. However, during their brief duration, they emit an **enormous amount of energy, equivalent to the energy released by hundreds of millions of suns.**
2. **Radio Waves:** FRBs are detected as **transient radio signals in the electromagnetic spectrum.** They are observed at **various radio frequencies**, ranging from a few

hundred megahertz to several gigahertz.

3. **Origin and Distance:** The exact origin and nature of FRBs are still **not fully understood.** However, they are believed to originate from **distant extragalactic sources** located billions of light-years away from Earth.
4. **Dispersion Measure:** One of the most intriguing properties of FRBs is the dispersion measure. As the radio waves from an FRB travel through interstellar space, they encounter **free electrons** that cause the waves to **disperse**, with **lower-frequency waves arriving slightly later than higher-frequency waves.** The dispersion measure helps scientists **estimate the distance to the FRB source and provides clues about the intervening medium.**
5. **Repeating and Non-Repeating FRBs:** Some FRBs have been observed to repeat, emitting multiple bursts over time, while others have been observed only once. Repeating FRBs offer scientists the opportunity to study them in more detail and investigate their origins.
6. **Astrophysical Origin:** The exact astrophysical mechanisms that generate FRBs are still a topic of active research and debate. Several hypotheses have been proposed, including **neutron star mergers, magnetars (highly magnetized neutron stars), and other cataclysmic events** in the universe. Pinpointing the exact source of FRBs remains a significant challenge.
7. **Detection and Observatories:** FRBs are detected using **radio telescopes**, which are equipped

with sensitive receivers capable of capturing and analyzing the radio wave signals.

### Why in News?

- Astronomers have detected a Fast Radio Burst radio signal (termed FRB 20190520B) from space.

## 2) Quantum Computing

### What is Quantum computing?

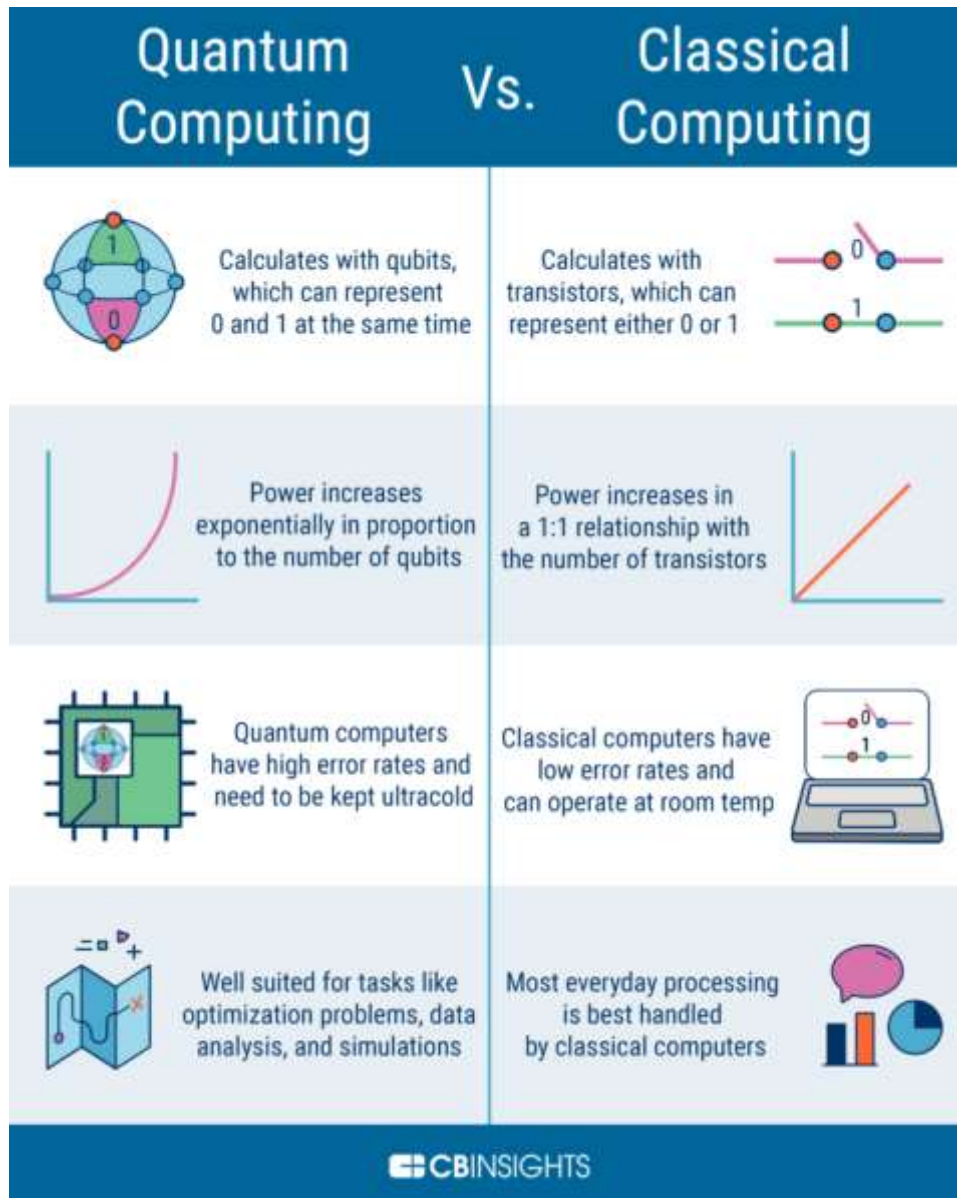
- Quantum computing is a **multidisciplinary field comprising aspects of computer science, physics, and mathematics** that utilizes **quantum mechanics** to solve complex problems faster than on classical computers.
- Quantum computers are able to solve certain types of problems faster than classical computers by taking advantage of **quantum mechanical effects**, such as **superposition** and **quantum interference**.

### Benefit of quantum-computing

- A quantum computer today can use **individual electrons as qubits** – its fundamental units of

information. Information can be encoded in some property of each electron, like its spin. Then, the computer manipulates that information by having the electrons interact with each other according to the rules of quantum mechanics.

- These rules are what **make quantum computers better than classical computers**: they allow the computers to access computational techniques and pathways not available to systems that are limited to the possibilities of classical physics.
- For example, a **qubit** can have the **values 0 and 1 at the same time** thanks to a property called **quantum superposition**. But a **semiconductor** in a classical computer can have **only one value at a time, 0 or 1**.
- On the flip side, quantum computers are **very fragile**. Tap your fingers on a table on which there's a computer and it could lose its quantummy abilities. That is, it could decohere.



### Basic properties of quantum computing:

1. **Superposition:** Superposition is the ability of a quantum system to be in **multiple states simultaneously**. The go-to example of superposition is the flip of a coin, which consistently lands as heads or tails—a very binary concept. However, when that coin is in mid-air, it is both heads and tails and until it lands, heads and tails simultaneously. Before measurement, the electron exists in quantum superposition.
2. **Entanglement:** Entanglement as a quantum property is **taking**

**objects and connecting them by permanently entangling them together.** Every time we add just one more qubit to a quantum computer, the **number of states it can represent and examine doubles**. So a 50 qubit quantum machine could examine  $2^{50}$  states at once; this exponential increase in power together with the entanglement of qubits is what allows quantum computers to solve certain problems so much more efficiently.

3. **Interference:** Interference can be used to **control quantum states and amplify the signals that are**

leading toward the right answer, while canceling signals that are leading to the wrong answer.

#### 4. Coherence/decoherence:

Quantum computers are **extremely sensitive to noise and environmental effects**. Unfortunately, information only remains quantum for so long. The **number of operations that can be performed before the information is lost, therefore, is limited. Knowing in advance** how long quantum information will last before it is out of coherence is critical.

### Applications of Quantum Computing

1. Cryptography and Security
2. Optimization and Logistics
3. Drug Discovery and Material Science
4. Machine Learning and Artificial Intelligence
5. Financial Modeling and Risk Analysis
6. Quantum Chemistry
7. Weather Forecasting and Climate Modeling
8. Supply Chain Optimization.

### Why in News?

- Researchers at Microsoft recently announced that they had figured out a way to create an elusive kind of particle that could potentially revolutionise quantum computing.
- The claim pertains to particles called **Majorana zero modes**, whose unique properties **could help build quantum computers that are much less fragile** than they are today, making them computationally superior.

### What is a Majorana zero mode?

- **All particles have four quantum numbers associated with them. No two particles in the same system can have the same four quantum numbers.** The numbers

are together like **each particle's ID**.

- The characteristic feature of **fermions** is that **one of these numbers**, called the **quantum spin**, has only **half-integer values**, like  $1/2$ ,  $3/2$ ,  $5/2$ , etc. This is why any particle, even something as large as an entire atom, can be a fermion: its total quantum spin needs to have a half-integer value.
  - *All subatomic particles that make up matter are called **fermions**. (More accurately, only fermions can make up matter).*
- This is also why two particles that are bound to each other in some way can be a fermion: again, their total quantum spin needs to have a half-integer value. Most of the rules that apply to single fermions also apply to these pairs, or bound states.
- When these bound states are their own **antiparticles** – i.e. if they meet, they annihilate each other – they are **Majorana fermions**. Physicists call such bound states **Majorana zero modes**, and have been looking for them for at least two decades.

### How can Majorana zero modes help computing?

- In effect, Majorana zero modes can work as **qubits** and they **won't easily lose the information vested with them**. This is why people building quantum computers are interested in finding them.

### 3) Launch Vehicles of ISRO

#### Context

- The Indian Space Research Organisation (ISRO) has **three classes of launch vehicles**: the Polar Satellite Launch Vehicle (PSLV), the Geosynchronous Satellite Launch Vehicle (GSLV), and the new Small Satellite Launch Vehicle (SSLV).

#### About PSLV

- Polar Satellite Launch Vehicle (PSLV) is the **third generation launch vehicle** of India. It is the **first Indian launch vehicle to be equipped with liquid stages**.
- PSLV has a **four-stage system** comprising a **combination of solid and liquid-fuelled rocket stages**.
  - The first stage at the very bottom is **solid fuelled**, having six strap-on solid rocket boosters wrapped around it. Second stage is **liquid fuelled** whereas the third stage has a **solid fuelled** rocket motor. At the fourth stage, the launcher uses a **liquid propellant** to boost in outer space.



- After its first successful launch in 1994, PSLV emerged as the **reliable and versatile launch vehicle of India**. It has a famous reputation as a "**workhorse**", with **a very low failure rate**.
- The PSLV can lift up to **3.8 tonnes to low-earth orbit**.
- Some remarkable launches by PSLV are **Chandrayaan-1** (First Indian lunar probe), **Mangalyaan-1** (First Mars Orbiter Mission by India) and **Astrosat** (First Indian dedicated multi-wavelength space observatory).
- In addition to launching satellites into LEO, PSLV has also launched satellites for **communication, meteorology, navigation, scientific experiments and space exploration missions**.

#### About GSLV/LVM3

- ISRO developed and uses the GSLV to launch **heavier payloads, and if required into higher orbits**. Like the PSLV, the GSLV also has multiple configurations. The most powerful configuration is **LVM-3, short for 'Launch Vehicle Mark 3'**.
- **LVM3** (earlier known as GSLV Mark III) is the **heavy lift launch vehicle of ISRO** for achieving a **4000 kg spacecraft launching capability to GTO (Geosynchronous Transfer Orbit)** in a cost effective manner.
- LVM3 is configured as a **three stage vehicle** with two **solid** strap-on motors, one **liquid** core stage and a high thrust **cryogenic upper stage**.
- The LVM-3 has **three stages**.
  - The first (or bottom-most) stage is in the form of **two S200 boosters strapped to the sides** of the rocket body. They combust a **solid fuel**

called hydroxyl-terminated polybutadiene.

- The second stage is powered by **two Vikas engines**, which combust a **liquid fuel** – either nitrogen tetroxide or unsymmetrical dimethylhydrazine.
- The uppermost final stage is powered by a **cryogenic engine**. It combusts **liquefied hydrogen with liquefied oxygen**.



- It is capable of lifting **4 tonne class satellites to Geosynchronous Transfer Orbit (GTO)** and about **8 tonnes to Low Earth Orbit (LEO)**.
- The rocket is mainly used by the space organisation to launch **geostationary communication satellites**.
- This rocket was deployed to launch the **Chandrayaan-2 mission** to the moon in 2019. It will also be used for **India's maiden human space flight - Gaganyaan**.

#### About SSLV

- SSLV is the new small satellite launch vehicle developed by ISRO to **cater the launch of small**

**satellites up to 500 kg to Low Earth Orbits.**

- It is configured with **three solid stages** and a **liquid propulsion-based Velocity Trimming Module (VTM)** which helps achieve desired velocity for the insertion of the satellites into the intended orbit.



- SSLV is capable of launching **Mini, Micro, or Nanosatellites** (10 to 500 kg mass) to a **500 km orbit**.
- It provides **low-cost access to Space**, offers **low turn-around time**, facilitates **flexibility** in accommodating multiple satellites and demands **minimal launch infrastructure**.

## 4) India's Space policy

### Context

- The Government of India has approved the Indian Space Policy – 2023 and released it in the public domain.

### What is the Indian Space Policy 2023?

- The Indian Space Policy 2023 is a comprehensive set of guidelines that **outlines the roles and responsibilities of different entities** in the Indian space sector.
- It aims to **encourage and institutionalize private sector participation** in India's space sector, with the **Indian Space Research Organisation (ISRO)**



primarily focusing on research and development of advanced space technologies.

- It will provide the private sector with **greater access to ISRO's infrastructure, technology and expertise** to support their space-related activities.
- It aims to **increase India's share in the global space economy from less than 2% to 10%**.

### Highlights of the Policy

- The Space Policy creates **four distinct, but related entities**, that will facilitate greater **private sector participation in activities** that have usually been the traditional domain of ISRO.

#### 1. InSPACE:

- **Indian National Space Promotion and Authorisation Centre (InSPACE)** will be a “**single window**” **clearance and authorisation agency** for space launches, establishing launch pads, buying and selling satellites, and disseminating high-resolution data among other things.
- It will also develop space industry standards, promote identified space activities and work with academia to widen the space ecosystem and enable industry-academia linkages.

#### 2. ISRO:

- ISRO, as the **National Space Agency**, will focus primarily on **research and development of new space technologies and applications**, and for **expanding the human understanding of outer space**.
- It will also **share technologies, products, processes and best practices with NGEs** (non-government entities) and government companies.

#### 3. New Space India Limited:

- NSIL, as the **Public Sector Undertaking** under **Department of Space (DOS)**, will be responsible for **commercialising space technologies and platforms** created through public expenditure.
- NSIL will also be responsible for manufacture, lease, or procure space components, technologies, platforms and other assets from the private or public sector, on sound commercial principles.

#### 4. Department of Space:

- Finally, the **Department of Space** will provide **overall policy guidelines** and be the “**nodal**” **department for implementation of the Indian Space Policy-2023**.
- It will also be responsible for **international cooperation and coordination** in the area of **global space governance and programmes in consultation with the Ministry of External Affairs**.
- It will also create **an appropriate mechanism to resolve disputes** arising out of space activity.

### Other Key Features

#### Private Sector Participation

- Another key feature of the Indian Space Policy 2023 is the **entry of the private sector into end-to-end space activities**.
- Private companies will be allowed to **build satellites, rockets, and launch vehicles, and engage in data collection and dissemination**.
- It encourages private companies to **invest in creating new infrastructure** for the space sector and **use ISRO facilities** for a small charge.

#### Space sector of India

- India's space sector is globally recognized for **cost-effective satellite building**, and it advocates

for **peaceful and civilian use of outer space**.

- ISRO has an **exceptional success rate** and is the **6th largest space agency globally**.
- ISRO also launched a **student outreach program** called **SAMVAD** to encourage space research among young minds.
- However, the space sector faces **major challenges** as well including a **lack of regulations** on commercialisation which could lead to **monopolisation, rising space debris** from increasing expeditions, **China's rapid growth** in the space industry and **potential weaponization**, and an increasing **global trust deficit** creating an environment of suspicion and potential conflict.

## 5) Tuberculosis

### What is TB?

- Tuberculosis (TB) is a disease **caused by bacteria called Mycobacterium tuberculosis**. TB is an ancient disease and has been documented to have existed in Egypt as early as 3000 BC.
- TB most commonly affects the **lungs** (pulmonary TB), but it can also affect **other organs** (extra-pulmonary TB).
- TB **spreads through the air** when a person with TB of the lungs or throat coughs, sneezes, or talks.
- Common symptoms of TB are:
  - Cough for three weeks or more, sometimes with blood-streaked sputum;
  - Fever, especially at night;
  - Weight loss and Loss of appetite.

### Who is at risk?

- **Over 95% of cases and deaths are in developing countries.**
- People infected with TB bacteria have a 5–10% lifetime risk of falling

ill with TB. Those with **compromised immune systems**, such as people living with HIV, malnutrition or diabetes, or people who use tobacco, have a **higher risk of falling ill**.

- However, TB is **curable and preventable**.

### Treatment for TB

- **Directly Observed Treatment Short-course (DOTS)** is the strategy followed for treatment of TB. Tuberculosis treatment requires **at least 6 months of treatment**.
- Currently, **BCG (Bacillus Calmette-Guerin)** is the only licensed vaccine available for the prevention of TB.
- **BCG works well in certain places but not so well in others**. Generally, the farther a country is from the equator, the higher is the efficacy.
- However, BCG gives **excellent protection against severe forms of tuberculosis in children**.

### What is Multidrug-resistant TB?

- Anti-TB medicines have been used for decades and **strains that are resistant** to one or more of the medicines have been documented in every country surveyed. Drug resistance emerges when **anti-TB medicines are used inappropriately**, through incorrect prescription by health care providers, poor quality drugs, and patients stopping treatment prematurely.
- **Multidrug-resistant tuberculosis (MDR-TB)** is a form of TB caused by **bacteria that do not respond to isoniazid and rifampicin**, the 2 most effective first-line anti-TB drugs.
- MDR-TB is treatable and curable by **using second-line drugs**. However, second-line treatment options are **limited and require**

**extensive chemotherapy** (up to 2 years of treatment) with medicines that are expensive and toxic.

### India and TB

- According to the **WHO's Global TB Report**, 10 million people developed TB in 2019 with 1.4 million deaths. **India accounts for 27% of these cases.**
- **BCG** was first introduced in a limited scale in 1948 and became a part of the National TB Control Programme in 1962.
- **National Tuberculosis Elimination Programme (NTEP)** aims at **eliminating TB by 2025** in India. It is crafted in line with other health sector strategies and global efforts, such as the World Health Organization's (WHO) End TB Strategy.

### Government Measures

- **Nikshay Portal:** Nikshay is a unified ICT system for TB patient management and care in India and allows both public and private sector health care providers to manage their patients.
- **Nikshay Poshan Yojana (NPY):** Under the Nikshay Poshan Yojana government provide financial help to TB Patients for their treatment. The government provides **Rs 500/- per month** financial incentive to TB patients for their treatment and food. Nikshay Poshan Yojana Money will be transferred directly to the patient's bank account.

### Why in News?

- A recent research by the All India Institute of Medical Sciences, Bhubaneswar, suggests that the country has made remarkable strides in combating tuberculosis and stands a chance of eliminating it by 2025.
- There are multiple challenges along the way, topped by **limited budget**

**allocation.** Shortage of funds hinders the adoption of comprehensive strategies, and the expansion of diagnostic facilities and treatment options. The study calls on the government to **prioritise TB elimination through higher budget allocation.**

### Other Recommendations

#### Early detection:

- **Enhanced diagnostic capability** is another key aspect of the battle against TB. It is essential to equip healthcare facilities with advanced diagnostic technologies to accurately detect TB and determine drug resistance.

#### Social factors

- Equally important is the **need to address the social, economic, cultural, and nutritional vulnerabilities** in the fight against tuberculosis. Factors such as **overcrowding, migration, social stigma, and poor nutritional status** contribute to the spread and persistence of the disease.

#### Role of private sector

- India's TB treatment is **not centralised as it is not uniform.** Nearly 50 per cent of TB patients are diagnosed in the private sector and the rest by the government sector. Although the private sector reporting of tuberculosis has gone up from 4 per cent to 25 per cent, there is a **huge gap due to underreporting.**
- The inclusion of private healthcare providers in TB elimination efforts can vastly expand the reach of diagnostic and treatment services.

## 6) National Sickle Cell Anaemia Elimination Mission

### What's in the news?

- The Government of India has launched the **National Sickle Cell Anaemia Elimination Mission** to address the pressing health challenges posed by sickle cell disease, particularly among the tribal population.
- The launch will mark a crucial milestone in the Government's ongoing efforts to **eliminate sickle cell disease as a public health problem by 2047**.
- The mission aims to cover 7 crore people with screening, counselling for prevention and care for people with sickle cell disease in three and half years.

### What is sickle cell anaemia?

- Sickle cell anaemia (SCA) is an **inherited genetic disease**. **Haemoglobin** which is tasked with carrying oxygen to all parts of the body has **four protein subunits — two alpha and two beta**. In some people, **mutations in the gene** that creates the beta subunits **impact the shape of the blood cell and distort it to look like a sickle**, similar to the letter C.
- A round red blood cell can move easily through blood vessels because of its shape but sickle red blood cells **end up slowing and even blocking the blood flow**. Moreover, sickle cells **die early**, resulting in a **shortage of red blood cells that deprive the body of oxygen**.
- These obstructions and shortages may cause **chronic anaemia, pain, fatigue, acute chest syndrome, stroke, and a host of other serious health complications**.

### Prevalence

- **India is the second-worst affected country in terms of predicted births with SCA — i.e. chances of being born with the condition.**
- The disease burden from Sickle Cell anaemia in India is **prevalent in tribal populations**. Tribes like **Pawara, Bhil, Madia, Gond and Pardhan from Maharashtra** have a very high prevalence.
- Sickle cell anaemia is **most prevalent in the central India belt covering states like Gujarat, Maharashtra, Chhattisgarh, Orissa and parts of Bengal**. There are **pockets in the south, Tamil Nadu, Kerala and parts of Telangana**.
- There is a **lack of screening awareness and inadequate screening centres/facilities** in tribal and rural areas. Also, **failure to access primary healthcare** is a concern.

### Treatment

- Sickle cell anaemia is a **genetic disorder, making complete "elimination" a challenge** that requires a major scientific breakthrough.
- The only cure comes in the form of **gene therapy and stem cell transplants — both costly and still in developmental stages**.
- In gene therapy, the DNA inside the haemoglobin gene is edited to stop the disease while in stem cell transplants, the bone marrow affected by sickle cell anaemia is replaced with healthy bone marrow from a donor. Both interventions are currently being tested in **clinical trials** globally.
- **Blood transfusion**, wherein red blood cells are removed from donated blood and given to a patient, is also a trusted treatment

in the absence of permanent cures. But challenges include a **scarcity of donors, fears around safe supply of blood, risk of infection etc.**

## 7) Deep Ocean Mission

### What is it?

- It is an initiative spearheaded by the **Ministry of Earth Sciences (MoES)** in collaboration with ISRO, DRDO, Department of Atomic Energy (DAE), Council of Scientific and Industrial Research (CSIR), Department of Biotechnology (DBT) and the Indian Navy.
- The Indian government wants to understand the oceans better, both as a resource and for the conservation of marine biodiversity.
- One of the main aspects of the mission will be **design, development and demonstration of human submersibles** (in the image below).



- Another aspect is **exploring the possibility of deep sea mining and developing necessary technologies.**
- Under the mission, studies are planned at depths close to 6,000 metres under **six major components** —
  1. Mineral exploration on the sea-bed;

2. Study and mapping of biodiversity;
3. Study of climate change;
4. Exploration of marine biology and developing allied courses,
5. Training; development and demonstration of ocean exploration
6. Off-shore technologies for future.

### Significance of the mission

- The mission forms a part of the **Blue Economy** envisioned to be developed by 2030, which will place India among select countries — US, France, Japan, Russia and China — to have special missions dedicated for ocean studies.
- It is a **strategic and geo-political move** in order to further strengthen India's position in the Indian Ocean region.
- Globally, **only 11 percent of marine species have been identified.** The deep ocean species are even less explored. Hence it will be helpful in identifying the species and knowing more about **climate change.**

### Economic Potential

- It will enable India to develop capabilities to **exploit resources in the Central Indian Ocean Basin (CIOB).**
- CIOB reserves contain deposits of metals like iron, manganese, nickel and cobalt. It is envisaged that **10% of recovery of that large reserve can meet the energy requirement of India for the next 100 years.**
- India has also been allotted 75,000 square kilometres in the CIOB by the **UN International Sea Bed Authority (ISA)** for exploration of **poly-metallic nodules.**
  - *The ISA is an institution set up under the UN Convention on Law of the*

***Sea to which India is a Party.***

- *Polymetallic nodules are rounded accretions of **manganese and iron hydroxides** that cover vast areas of the seafloor, but are most abundant on abyssal plains at water depths of 4000-6500 metres. They form through the aggregation of layers of iron and manganese hydroxides around a central particle (such as a shell or small rock fragment), and range in size from a few millimeters to tens of centimeters.*
- *Growth of these nodules is extremely slow, at a rate of millimetres per million years, and they remain on the seafloor surface, often*

*partially buried in a thin layer of sediment.*

- *The composition of nodules varies with their environment of formation, but in addition to manganese and iron, they can contain **nickel, copper and cobalt** in commercially attractive concentrations as well as traces of other valuable metals such as **molybdenum, zirconium and Rare Earth Elements**. They are viewed as potential resources to take care of the depleting land resources and increasing demand of these metals.*

**Why in News?**

- The Government has allocated Rs.1400 crore for the Deep Ocean Mission.

## Reports and Indices

### 1) Export Preparedness Index 2022

#### What's in the news?

- NITI Aayog has released the third edition of its Export Preparedness Index (EPI) for States/UTs for the year 2022.

#### About the Index

- The Export Preparedness Index is published by NITI Aayog to **assess the readiness of the states in terms of their export potential and performance.**
- The EPI 2022 Report evaluates the performance of the states across **four pillars** – **Policy, Business**

#### Ecosystem, Export Ecosystem, and Export Performance.

- These pillars are further based on **ten sub-pillars** – Export Promotion Policy; Institutional Framework; Business Environment; Infrastructure; Transport Connectivity; Export Infrastructure; Trade Support; R&D Infrastructure; Export Diversification; and Growth Orientation.
- The index uses **56 indicators** which holistically capture the export preparedness of States and UTs in terms of exports at both the state and district-level.

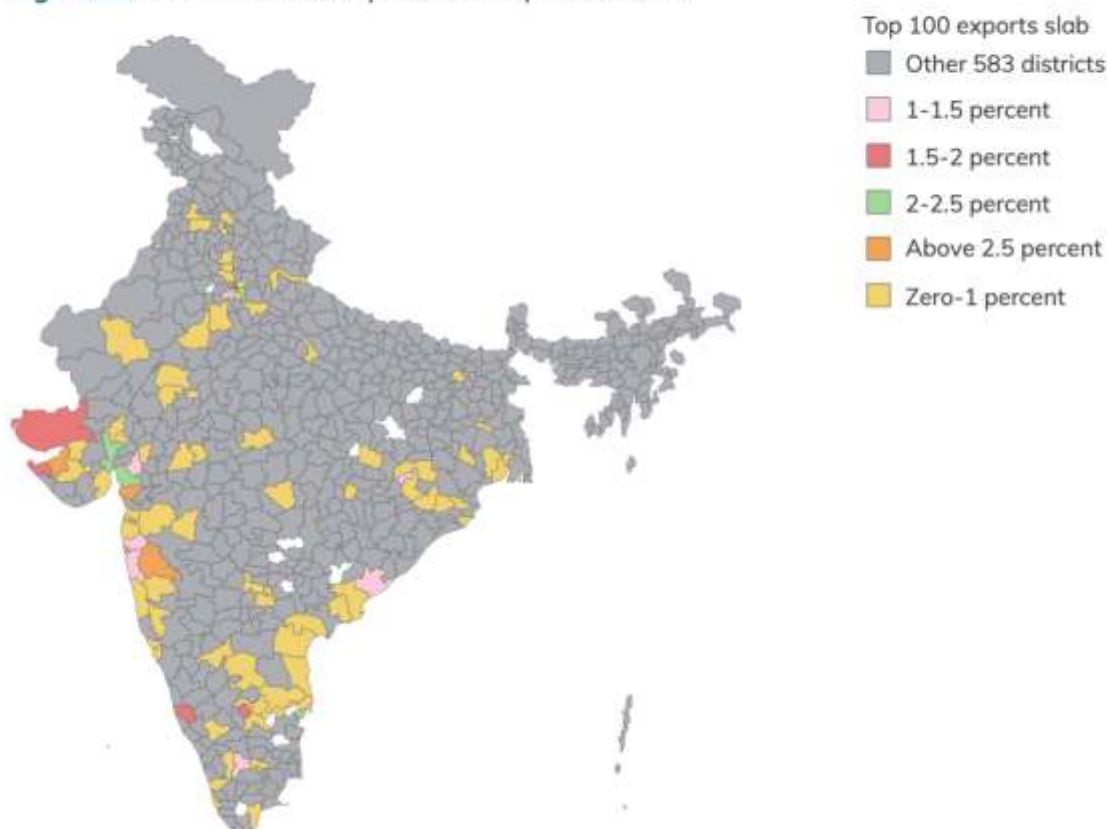


### Highlights of the Report

- The latest index shows that **Tamil Nadu** with an overall score of 80.89 topped the third edition of rankings, followed by **Maharashtra** (78.20) and **Karnataka** (76.36).
- Among **hilly/Himalayan states**, **Uttarakhand** has ranked at the top position. **Haryana** topped the chart among the **landlocked regions**. In the category of **Union Territories/small states**, **Goa** was ranked first.
- The index is aimed at promoting **competition among all states** (coastal, landlocked, Himalayan and UTs) to bring about favourable policies, ease the regulatory framework, create necessary infrastructure and assist in identifying strategic recommendations for improving export competitiveness.
- Talking about districts, the report added that out of the 680 districts which engage in exports, the **top 100 districts contribute about 87 per cent of the total exports from India**.
- Among export districts, **Jamnagar** in Gujarat topped the chart. It was followed by Surat, Mumbai Suburban, Mumbai, Pune, Bharuch, Kanchipuram, Ahmedabad, Gautam Budha Nagar and Bengaluru Urban.

### ► DISTRIBUTION OF TOP HUNDRED DISTRICTS

Figure 28: % Share of total exports from top 100 districts



### Recommendations

- The report encourages state governments to create **solutions to their context-specific challenges**

**to exports.** The states can also exploit their innate diversity by promoting products unique to them



and helping them reach the global market.

- **Consistent investment in research and development** can foster innovation, which in turn can facilitate higher efficiency in exports, and diversification of India's export basket.
- Further efforts in **identification of new markets and exporting diversified products** according to state's competitive advantage can help India in improving its global footprint.

## Polity

### 1) Protection of Plant Varieties and Farmers Rights' Authority Act

#### What is the PPV&FR Act?

- The Protection of Plant Varieties and Farmers Rights' Authority (PPV & FR) Act, 2001, provides an effective framework to **conserve and encourage the development of various plant varieties**.
- The Act was enacted as part of **India's obligation towards Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement of the World Trade Organization (WTO)**.
- To implement the provisions of the Act, the government established the **Protection of Plant Varieties and Farmers' Rights Authority** in 2005.

#### Objectives of the Act

- To establish an **effective system for the protection of plant varieties, the rights of farmers and plant breeders** and to **encourage the development of new varieties of plants**.
- To **accelerate agricultural development in the country, stimulate investment for research and development** for the development of new plant varieties.
- **Facilitate the growth of the seed industry** in the country which will ensure the availability of high quality seeds and planting material to the farmers.

#### What is the meaning of protection of plant varieties?

- The protection on the variety under the Act means no one can sell, export, import or produce the seed or propagating materials of such protected (registered) plant variety

without the registered breeder's (owner's) permission.

- A variety is eligible for registration under the Act if it **essentially fulfills the criteria of Distinctiveness, Uniformity and Stability (DUS)**.

#### Rights under the Act

##### Breeders' Rights:

- Breeders will have **exclusive rights to produce, sell, market, distribute, import or export the protected variety**.
- Breeders may exercise for civil remedy in case of infringement of rights.

##### Researchers' Rights:

- Researchers can use **any of the registered varieties under the Act for conducting experiment or research**.
- This includes the use of a variety as an initial source of variety for the purpose of developing another variety but **repeated use needs prior permission** of the registered breeder.

##### Farmers' Rights:

- A Farmer who has **evolved or developed a new variety is entitled for registration and protection** in like manner as a breeder of a variety;
- A farmer can **save, use, sow, re-sow, exchange, share or sell his farm produce including seed of a variety protected** under the PPV & FR Act in the same manner as he was entitled before the coming into force of this Act provided farmer shall not be entitled to sell branded seed of a variety protected under the PPV&FR Act.
- Farmers are eligible for **recognition and rewards** for the

conservation of Plant Genetic Resources of land races and wild relatives of economic plants;

- **Farmer shall not be liable to pay any fee** in any proceeding before the Authority or Registrar or the Tribunal or the High Court under the Act.

#### **Community Rights:**

- It is **compensation to village or local communities for their significant contribution** in the evolution of variety which has been registered under the Act.
- Any person/group of persons/governmental or non-governmental organization, on behalf of any village/local community in India, can file in any notified centre, claim for contribution in the evolution of any variety.

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

- The Delhi High Court rejected an appeal filed by PepsiCo over the patent rights for its 'unique potato' variety.
- The appeal was against an order passed by the Protection of Plant Varieties and Farmers Rights' Authority (PPVFRA), revoking PepsiCo's registration vis-a-vis the potato variety developed by it.
- The court held that the potato variety do not fulfil the criteria of novelty under the Act.

## **2) No-trust vote**

#### **Context**

- Lok Sabha Speaker has admitted a motion of no-confidence against the government after a headcount of 50 MPs required under the rules.

#### **What is the purpose of a no-confidence motion against the government?**

- In a **parliamentary democracy**, a government can be in power only if

it **commands a majority in the directly elected House.**

- **Article 75(3)** of our Constitution embodies this rule by specifying that the **Council of Ministers are collectively responsible to the Lok Sabha.**
- For **testing this collective responsibility**, the rules of Lok Sabha provide a particular mechanism – a **motion of no-confidence.**
- **Any Lok Sabha MP**, who can garner the **support of 50 colleagues**, can, at any point of time, introduce a motion of no-confidence against the Council of Ministers.
- Finally, a vote takes place – in case the motion carries, the government is bound to vacate the office.
- A no confidence motion **can only be moved in the Lok Sabha.**
- **Twenty-seven no-confidence motions** have been moved so far. **None of these motions has been successful.**
- In 1979, Prime Minister Morarji Desai realised that he did not have the support of the majority of MPs, and therefore resigned before the House voted on the motion.

#### **Given the history of failure, why do oppositions still bring these motions?**

- Opposition parties have continued to press the no-confidence motion essentially to **hold the government accountable.**
- In **1963, J B Kripalani** moved the first no-confidence motion in Lok Sabha even though the government of Prime Minister Jawaharlal Nehru had a comfortable majority.
- It is this principle of holding the government responsible to Lok Sabha that led to the opposition initiating **12 no-confidence motions** against Indira Gandhi

when she was Prime Minister between 1966 and 1975.

- The **debate on a no-confidence motion is also wide-ranging**. Participating MPs raise both national and state issues during this debate.

#### When will the debate on the current no-confidence motion start?

- The rules of procedure of Lok Sabha specify that after the no-confidence motion is admitted, the **Speaker shall specify the date on which the debate will begin**. This date should be **within 10 days** from the date the motion was accepted in the House.
- The debate can go on for many hours, over multiple days.

### 3) National Commission for Protection of Child Rights

#### About NCPCR

- The National Commission for Protection of Child Rights (NCPCR) is a **statutory body** established under the **Commission for Protection of Child Rights Act, 2005**.
- The commission works under the aegis of the **Ministry of Women and Child development**.
- NCPCR is mandated to function for the protection and promotion of child rights. It is also mandated to monitor the implementation of the **Protection of Children from Sexual Offences (POCSO) Act**.

- The Commission may inquire into complaints and take *suo motu* notice of matters relating to-
  - Deprivation and violation of child rights;
  - Non-implementation of laws providing for protection and development of children;
  - Non-compliance of policy decisions, guidelines or instructions aimed at mitigating hardships to and ensuring welfare of the children and to provide relief to such children;

#### Constitution

- The commission consist of the following members namely:-
  - A **chairperson** who, is a person of eminence and has done a outstanding work for promoting the welfare of children; and
  - **Six members**, out of which at least two are women, are appointed by the Central Government from amongst persons of eminence, ability, integrity, standing and experience in Education; Child health, care or related fields.

#### Why in News?

- The National Commission for Protection of Child Rights organised a Regional Symposium on Child Protection, Child Safety and Child Welfare in Mumbai.

## Art & Culture

### 1) Alluri Sitarama Raju

#### About

- Alluri Sitarama Raju was an **Indian revolutionary** who waged an armed campaign against British colonial rule in India.
- Born in present-day **Andhra Pradesh** in 1897, Alluri Raju became involved in anti-British activities in response to the **1882 Madras Forest Act**, which effectively restricted the free movement of tribal communities in their forest habitats and prevented them from practicing a traditional form of agriculture known as **podu** (shifting cultivation).
- He is famously remembered for leading the "**Rampa rebellion**" or "**Manyam Rebellion**", in 1922-24 in the Visakhapatnam-Godavari agency area of the then Madras Presidency. He was nicknamed "**Manyam Veerudu**" (**Hero of the Jungle**) by local villagers for his heroic exploits.
- Alluri Raju, along with 500 tribals, attacked the police stations of Chintapalli, Krishnadevipeta, and Rajavommangi and walked away with 26 police carbine rifles and 2,500 rounds of ammunition.
- The Rampa Rebellion coincided with **Mahatma Gandhi's Non-Cooperation Movement**. Raju talked of the greatness of Mahatma Gandhi, and he was inspired by the Non-Cooperation Movement, and **persuaded people to wear khadi and give up drinking**. But at the same time, he asserted that **India could be liberated only by the use of force, not non-violence**.
- Sitarama Raju **did not belong to the tribal community** but understood the restrictions that the British colonial administration

placed on the tribal way of life. Forced labour, embargoes on collecting minor forest produce and bans on tribal agriculture practices led to severe distress among the Koyas of the Godavari Agency area.

- In 1924, Raju was taken into police custody, tied to a tree, and shot by public execution, effectively ending the armed rebellion.

#### What's in the news?

- President Droupadi Murmu participated in the 125th birth anniversary celebrations of legendary freedom fighter Alluri Sitarama Raju.

### 2) Hul Diwas

#### About Hul Diwas

- **Hul Diwas**, refers to the commemoration of the **historic tribal uprising** known as the "**Santhal Rebellion**" that took place in India.
- The rebellion started on **June 30, 1855**, and is considered one of the earliest and most significant **anti-colonial movements** against British rule in India.

#### Significance

- "**Hul Diwas**" is observed to commemorate the **bravery and sacrifice** of the **Santhal leaders** and their community members during the rebellion.
- It serves as a reminder of the struggles faced by **indigenous communities** against colonial oppression and the fight for their **rights and autonomy**.
- The day is often marked by various cultural and educational events, seminars, discussions, and tributes to honor the memory of the Santhal leaders and their contributions to India's freedom struggle.

### Why in news?

- The Prime Minister of India recently commemorated Hul Diwas to honour the sacrifice of Santhals in their fight against British colonial authorities.

### Santhal uprising

- The Santhal Rebellion was led by the **Santhal tribe**, residing in the present-day states of **Jharkhand, West Bengal, Bihar, and Odisha**.
- The **Santhals** were reacting against **oppressive policies** of the **British colonial administration**, which included issues such as **land dispossession, forced labor, and unjust taxation**.
- The rebellion was marked by the Santhal community's determination to resist these injustices and regain control over their lands and resources.
- The movement was characterized by its collective spirit, as the Santhals came together under the **leadership** of notable figures like **Sidhu** and **Kanhu Murmu**, and attacked British establishments and symbols of authority.

## 3) Namda Art

### About Namda art

- Namda art refers to a **traditional form of felted rug-making** that originates from the **Kashmir region** in India.

- It originated in the **16th century** and was introduced by a **Sufi saint** named **Shah-e-Hamdan**.



- This art form involves creating **thick, soft, and durable rugs** by felting wool fibers together.
- Here the wool is **not woven**, but the wool is **felted**, that is, the wool is **placed layer by layer**.
- Its theme is based on **floral patterns** and flowers, leaves, buds, fruits etc. are an essential part of its design.
- It is practised as a craft in several cultures, especially in the countries throughout **Asia**, viz. **Iran, Afghanistan and India**.

### Why in news?

- The Namda craft of Kashmir is being successfully revived under a Skill India's Pilot Project as part of the Pradhan Mantri Kaushal Vikas Yojana with nearly 2,200 candidates being provided with skill training in the dyeing art form.

## Miscellaneous

### 1) Understanding Dark Patterns

#### What's in the news?

- The Department of Consumer Affairs and the **Advertising Standards Council of India (ASCI)** recently held a joint consultation with stakeholders on the menace of 'dark patterns'.
  - *ASCI is a voluntary self-regulatory organisation comprising members from marketing, creative, media, and allied companies in India. Established in 1985, ASCI is registered as a non-profit company.*
- The ASCI has come up with guidelines for the same, with the central government also working towards norms against 'dark patterns'.

#### What are dark patterns?

- A dark pattern refers to a **design or user interface technique** that is intentionally crafted to **manipulate or deceive users into making certain choices or taking specific actions that may not be in their best interest.**
- It is a deceptive practice employed to influence user behaviour in a way that benefits the company implementing it.
- For example, a common dark pattern is the **"sneak into basket" technique** used on e-commerce websites. When a user adds an item to their shopping cart, a dark pattern may be employed by automatically adding additional items to the cart without the user's explicit consent or clear notification.
- This can mislead the user into purchasing more items than they intended, potentially increasing the company's sales but compromising

the user's autonomy and decision-making.

- By using such dark patterns, digital platforms **infringe on the consumer's right to full transparency of the services** they use and control over their browsing experience.

#### Are dark patterns illegal?

- The legality of dark patterns is a **complex matter** as distinguishing between manipulation and fraudulent intent can be challenging.
- As of now, there are **no specific regulations** in place in most nations against dark patterns.
- In India, the government has warned companies to refrain from using such tactics in the e-market. However, with the growing use of e- platforms, a **robust legal mechanism** is a demand.