1. ECONOMY

1.1 GOVERNMENT ANNOUNCES SPECIAL ASSISTANCE TO STATES FOR CAPITAL INVESTMENT 2023-24

Latest context

Finance Ministry's Department of Expenditure Approves Rs. 56,415 Crore Capital Investment for 16 States in FY 2023-24

More about news

The 'Special Assistance to States for Capital Investment 2023-24' scheme provides loans to 16 states including Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal, Pradesh, Karnataka, Madhya Pradesh, Mizoram, Odisha, Rajasthan, Sikkim, Tamil Nadu, Telangana, West Bengal, Arunachal Pradesh.

SPECIAL ASSISTANCE TO STATES

State	Amount (in ₹ cr)	State	Amount (in ₹ cr)
Bihar	9640	Chhattisgarh	3195
MP	7850	Telangana	2102
West Bengal	7523	AP	1255
Rajasthan	6026	Haryana	1093
Odisha	4528	HP	826
Tamil Nadu	4079	Mizoram	399
Karnataka	3647	Sikkim	388
Gujarat	3478	Goa	386

Source: Ministry of Finance

About the scheme

The Ministry of Finance introduced a scheme in 2020-21 to provide **financial assistance to states for capital investment/expenditure in response to the COVID-19 pandemic.** The scheme was implemented in the previous financial year as well.

The Scheme's Objectives

- The primary objective of the scheme is to generate a significant multiplier effect on the economy by **stimulating demand and generating employment opportunities.**
- Another key objective is to expedite projects in crucial sectors like the Jal Jeevan Mission and Pradhan Mantri Gram Sadak Yojana. This is achieved by providing funds to cover the state's share of the project costs.
- Furthermore, the scheme aims to **incentivize states to undertake reforms in urban planning and urban finance.** These reforms are intended to enhance the overall quality of life and governance in cities, leading to improved urban infrastructure and services.

Importance of the Scheme

- As part of the scheme unveiled in the budget for 2023-24, State Governments will be provided with special support in the form of a 50-year interest-free loan, amounting to a maximum of Rs. 1.3 lakh crore for the entire financial year.
- Capital expenditure involves the allocation of government funds towards long-term investments and development projects that create assets.

The importance of capital expenditure includes

- **Revenue Generation:** Capital expenditure initiatives have the potential to generate revenue for the government through the creation of productive assets and infrastructure.
- **Economic Demand:** Capital expenditure projects stimulate demand in the economy by creating jobs and income opportunities, leading to increased consumption and economic growth.

- **Private Investment Attraction:** Capital expenditure signals the government's commitment to infrastructure development, attracting private investments and fostering economic expansion.
- **Labour Participation:** Capital expenditure initiatives require labour, thereby increasing employment opportunities and enhancing labour force participation.
- **Productive Capacity Enhancement:** Investments in capital projects improve the productive capacity of the economy, enabling increased output and productivity.

Scheme Allocation and Its Parts

Part I: Allocation of Rs. 1 lakh crore among States based on their share of central taxes & duties as per the 15th Finance Commission's award.

Part II: Incentives for the scrapping of old vehicles.

Part III: Reforms in urban planning.

Part IV: Reforms in financing for Urban Local Bodies (ULBs) to enhance their creditworthiness for Municipal Bonds.

Part V: Provision of housing for police personnel within or as part of urban police stations.

Part VI: Construction of Unity malls.

Part VII: Establishment of libraries with digital infrastructure at the Panchayat and Ward levels, primarily benefiting children and adolescents.

Part VIII: Incentives for the timely release of funds under Centrally Sponsored Schemes by state governments.

1.2 RBI ANNOUNCED NEW MEASURES FOR URBAN CO-OPERATIVE BANKS

Latest Context:
Recently, the Reserve Bank of India (RBI) announced some measures to strengthen Urban Co-operative Banks (UCBs).

About Urban Cooperative Banks (UCBs)
- UCBs are **financial institutions that operate on a cooperative basis and are primarily located in urban and semi-urban areas of India.**
- They are an essential part of India's banking sector and play a crucial role in providing financial services to individuals, small businesses, and local communities.
- Presently, there are **about 1,551 UCBs in the country.**
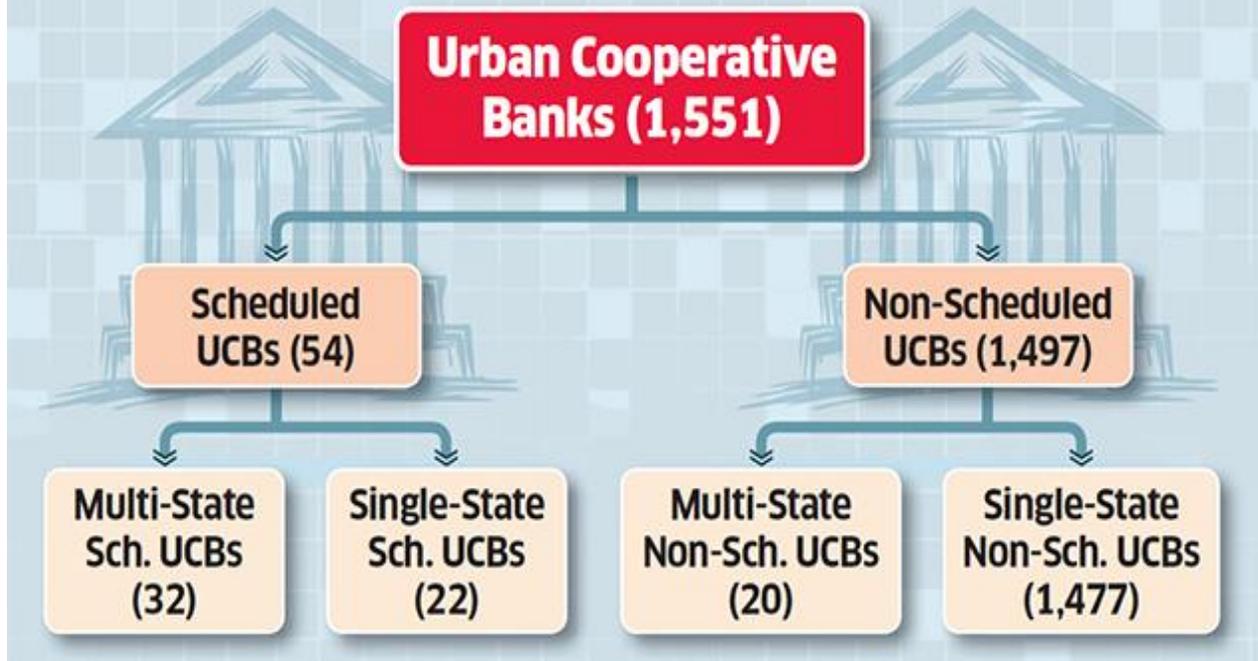
Features of UCBs are:
- **Cooperative Structure:** UCBs operate as cooperative societies, which means they are owned and managed by their members, who are usually residents of the local area where the bank is located. Each member has a share in the bank and can participate in its decision-making process.
- **Dual Regulation:** UCBs are subject to dual regulation. The RBI is responsible for regulating and supervising these banks, just like any other scheduled commercial bank. Additionally, they are regulated by the respective State Governments under the State Cooperative Societies Act.
- **Types of Urban Cooperative Banks:** UCBs can be classified into two categories based on their size and functions:
  a) Scheduled UCBs: These are banks that are included in the Second Schedule of the Reserve Bank of India Act, 1934, and are eligible to perform banking business across India.
  b) **Non-Scheduled UCBs:** These banks do not have the same privileges as scheduled UCBs and operate within specific regions.
- **Functions:** UCBs offer various banking services, including deposit accounts (savings and fixed deposits), loans and advances (personal loans, home loans, etc.), money transfer services, and other financial products.
- **Membership:** To become a member of an UCB, an individual must fulfil certain eligibility criteria and subscribe to the bank's shares. Members are typically expected to actively participate in the bank's decision-making process.
- **Necessity of Membership:** Historically, UCBs were established to address the credit needs of small borrowers and provide banking services to underserved areas, especially in urban and semi-urban regions.

Measures announced are:

- UCBs can now open new branches up to **10 percent (maximum 5 branches)** of the number of branches in the previous financial year without prior approval of RBI.
- To get the benefit of this facility, UCBs have to get the policy approved from their board and should comply with the **Financially Sound and Well Managed (FSWM) norms** of the RBI. The branch expansion under the prior approval route as per the existing framework will also continue.
- After getting approval from their board, **UCBs may allow for loan write-off** and can also do settlement with the borrowers. This has brought cooperative banks at par with other commercial banks.
- RBI has decided to **extend the timeline for UCBs to achieve Priority Sector Lending (PSL)** targets by 2 years **(i.e., up to March 31, 2026).** PSL refers to the lending targets set by the RBI to ensure that the financial institutions (like banks) provide a certain percentage of their total lending towards specific sectors that are declared as 'priority sectors' for economic development and social welfare like agriculture, MSMEs etc.
- **RBI has notified a nodal officer (in RBI)** to meet the long pending demand of the cooperative sector **for closer coordination and focused interaction.**

Issues with UCBs are:

- **Governance and Management:** Many UCBs have suffered from poor governance and management practices. There have been instances of mismanagement, lack of transparency, and inadequate internal controls, leading to financial irregularities and fraud.
- **Capital Adequacy:** Some UCBs have struggled to maintain the required level of capital adequacy, which is essential to tolerate financial shocks and meeting regulatory requirements. Low capital levels can make banks vulnerable to risks and potential failures.
- **Asset Quality and Non-Performing Assets (NPAs):** Some UCBs have faced challenges with asset quality, with a significant portion of their loan portfolios turning into non-performing assets (NPAs). This indicates that borrowers have defaulted on loan repayments, which negatively impacts the bank's financial health.
- **Deposit Erosion:** Issues related to governance and asset quality have led to a loss of confidence among depositors. As a result, there have been instances where depositors rushed to withdraw their funds, leading to deposit erosion and a liquidity crisis for the bank.
- **Dual Regulation:** The dual regulatory structure, with both the RBI and State Governments involved in regulation, has at times resulted in coordination challenges and delays in decision-making, affecting the banks' operations.
- **Lack of Professionalism:** Some UCBs have faced challenges in attracting and retaining skilled professionals and adopting modern banking practices due to their cooperative structure and limited resources.
- **Technology Adoption:** The adoption of modern banking technology and digital infrastructure has been relatively slow in some UCBs, which restricts their ability to provide efficient and competitive services to customers.

Conclusion

In conclusion, **UCBs in India have played a significant role in providing banking services to urban and semi-urban areas** and addressing the credit needs of small borrowers. However, they have faced several challenges over the years that have raised concerns about their financial stability and governance. Despite these challenges, the **RBI has been taking measures to strengthen the UCB sector and improve its governance and financial health through regulatory reforms.**

1.3 MINISTRY OF MINES RELEASED CRITICAL MINERAL FOR INDIA

Latest Context

Recently, the Ministry of Mines released the **first-ever report on "Critical Minerals for India"** prepared by an expert team constituted by the Ministry of Mines. In addition, it identifies and prioritizes minerals necessary for **various industrial sectors** complying with India's vision of achieving a robust and resilient mineral sector to attain the goal of attaining **'Net Zero' emissions**.

Critical Minerals

- **Minerals:** They are natural substances which are formed by geological processes. Having a definite chemical composition and physical properties, they are classified into **metallic and non-metallic minerals** based on their characteristics. Metallic minerals are the ones that contain metals or metal compounds like copper, gold, iron, silver, etc. As far as non-metallic minerals are concerned, they **do not contain metals**, like coal, mica, limestone, gypsum, etc.
- **Critical Minerals:** They are essential for economic development and national security, their paucity or unlimited extraction or processing in a few geographical locations may lead to vulnerabilities in the supply chain and even disruption in supplies that could hinder economic development.

Declaration of Critical Minerals:

- Factors like New technologies, market dynamics, and geopolitical considerations play a very important role in the declaration of the critical process. Hence, it is a dynamic process. Many countries in the world have their own unique lists of critical minerals based on their specific circumstances and priorities.
- For example, the **US** has declared **50 minerals critical** in light of their role in national security or economic development. **Japan** has identified a set of 3**1 minerals** that are critical for its economy. The **UK** identified **18 minerals critical**, **EU (34)**. **and Canada (31).**

List of Critical Minerals for India: The Expert Committee under the Ministry of Mines has identified a set of **30 critical minerals** for India.

- They are Niobium, Nickel, PGE, Phosphorous, Potash, REE, Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.
- The Committee also recommended the creation of the **Centre of Excellence for Critical Minerals (CECM) in the Ministry of Mines.** It will update the list of critical minerals for India and notify the critical mineral strategy from time to time on a periodic basis.

Significance of Critical Minerals for India

- **Environmental Sustainability:** They are playing a very crucial role as an integral component in the transition toward clean energy and a low-carbon economy and enabling the reduction of India's reliance on fossil fuels and greenhouse gas emissions. They are essential for achieving India's green objectives and a commitment to attaining **450 GW of renewable energy capacity** by 2030,
- **International Cooperation:** Through these collaborations, India is diversifying its import sources and reducing dependency on China, and enhancing mineral security and resilience.
- **Economic Development:** They play a very crucial role in the development of the industries like telecommunications, transport, high-tech electronics, and defence. Moreover, they are **necessary for green technologies** like wind turbines, batteries, solar panels, and electric vehicles. Due to playing a very crucial role in the economic growth of India, their growth can lead to job creation, income generation, and innovation.
- **National Security:** From a national security perspective, they are highly essential in defense, aerospace, nuclear, and space applications. These industries need high-quality and reliable materials capable of withstanding extreme conditions and performing complex functions. India must protect a steady and continuous supply of critical minerals to ensure defence preparedness and self-reliance.

Challenges for India Related to Critical Minerals

- **Limited Domestic Reserves:** Presently, India is having very limited reserves of critical minerals like lithium, cobalt, and other rare earth elements. India is heavily dependent on other countries for their supply and most of these minerals are imported from other countries. So much reliance on imports can create vulnerability in terms of price fluctuations, geopolitical factors, and supply disruptions.
- **Russia-Ukraine Conflict:** Ukraine possesses reserves of lithium, cobalt, graphite, and rare earth elements while Russia is a significant producer of various critical minerals. The Russia-Ukraine ongoing war is affecting these critical mineral supply chains.
- **Increasing Demand for Minerals:** The development of renewable energy technologies and the transition to electric vehicles require huge quantities of minerals such as copper, manganese, zinc, lithium, cobalt, and rare earth elements. India's limited reserves and higher requirements make it reliant on foreign partners to meet domestic needs.

Conclusion

Through the strategic management of these critical minerals, India is having an opportunity to strengthen its international cooperation and partnerships. India can contribute to the establishment of global critical mineral supply chains by involving in initiatives such as the **Mineral Security Partnership (MSP)** led by the **United States**, India's position in critical mineral exploration, development, processing, and trade is getting further enhanced through bilateral agreements with countries such as Australia, Canada, Japan, and South Africa.

1.4 SEMICONDUCTOR INDUSTRY IN INDIA

Latest Context:
Recently, the government has decided to invite new applications for setting up Semiconductor manufacturing parks under the 'Modified Semicon India Programme'.

About Modified Semi-con India Programme

- It was **launched in 2021 by the Ministry of Electronics and Information Technology (MeitY)** for the **development of a sustainable semiconductor ecosystem in India.**
- Objective of this program is to **provide attractive incentive support to companies** that are engaged in Silicon Semiconductor Fabs, Display Fabs, Semiconductor Design etc.
- Under this program, the **support will be provided for 6 years.**
- **India Semiconductor Mission,** within Digital India Corporation (MeitY) is the nodal agency for
  implementing the programme.

What are Semiconductors?

- Semiconductors are a **class of materials that have electrical conductivity between that of conductors (like metals) and insulators (like non-metallic materials).**
- These materials have a unique property that allows them to conduct electricity under certain conditions.
- It is estimated that, India's semiconductor market will value around **$64 billion** by 2026, showing 3-times growth from 2019.
- As per **India Electronics and Semiconductor Association (IESA),** semiconductor consumption in India is growing at a rate of **15%.**
- **Presently, Taiwan is the world leader in manufacturing microchips with producing over 60% of the world's semiconductors and over 90% of the most advanced ones.**

Significance of semiconductor industry for India

- **Economic Growth:** The semiconductor industry is a crucial driver of economic growth. By promoting domestic semiconductor manufacturing and design capabilities, India can create new job opportunities, attract investments, and contribute to the country's GDP growth.
- **Reducing Import Dependency:** India has been heavily reliant on semiconductor imports to meet the demands of its electronics and technology sectors. Developing a robust domestic semiconductor industry would help reduce import dependency and enhance the country's self-sufficiency in critical technologies.
- **Strengthening Electronics Manufacturing:** The semiconductor industry is the backbone of electronics manufacturing. By increasing its semiconductor capabilities, India can establish a stronger foundation for electronics manufacturing and attract more electronics companies to set up their manufacturing plants in the country.
- **Promoting Innovation and Research:** Investment in the semiconductor industry encourages research and innovation in cutting-edge technologies. This, in turn, promote a culture of innovation, leading to the development of new products and solutions that can benefit various sectors of the economy.
- **Supporting Strategic Industries:** Many strategic industries such as defence, space, and telecommunications heavily rely on semiconductor technologies. Building a robust semiconductor industry ensures access to critical technologies and enhances India's capabilities in these strategic sectors.

- **Enabling Emerging Technologies:** Emerging technologies like artificial intelligence (AI), Internet of Things (IoT), 5G, and autonomous vehicles are heavily dependent on semiconductor technologies. Developing a strong semiconductor industry will position India to leverage these technologies for socio-economic growth.
- **Export Opportunities:** A strong semiconductor industry opens up opportunities for India to export semiconductor components, chips, and devices to global markets, generating foreign exchange earnings.

Some of the key uses of semiconductors are as follows:
- **Transistors:** Transistors are fundamental semiconductor devices used in electronic circuits for amplification, switching, and signal processing. They form the backbone of modern electronics and are found in nearly all electronic devices, including computers, smartphones, televisions, and audio equipment.
- **Integrated Circuits (ICs):** Integrated circuits, commonly known as chips, are complex assemblies of multiple semiconductor components (transistors, resistors, capacitors) integrated into a single package. ICs are the building blocks of modern electronic systems, and they are used in microprocessors, memory chips, and various specialized application-specific circuits.
- **Diodes:** Diodes are semiconductor devices that allow current to flow in one direction only. They are used in rectifiers, voltage regulators, and signal demodulation in communication systems.
- **Solar Cells:** Semiconductor-based solar cells are used to convert sunlight into electricity. They are widely used in solar panels to generate renewable energy.
- **Light Emitting Diodes (LEDs):** LEDs are semiconductor devices that emit light when current passes through them. They are used for lighting purposes, display panels, indicators, and other applications.
- **Microcontrollers and Microprocessors:** These are specialized integrated circuits that contain a Central Processing Unit (CPU) along with memory and input/output peripherals.
- **Memory Devices:** Semiconductors are used in various memory technologies, including dynamic random-access memory (DRAM), static random-access memory (SRAM), and flash memory, which store data in electronic devices.
- **Power Electronics:** Semiconductors are used in power electronic devices such as power transistors, insulated gate bipolar transistors (IGBTs), and thyristors. These devices are critical in controlling and converting electrical power efficiently in applications like power supplies, motor drives, and electric vehicle inverters.
- **Sensors:** Semiconductors are used in various sensor technologies, including temperature sensors, pressure sensors, humidity sensors, and gas sensors, to measure and monitor physical properties in electronic systems and industrial applications.
- **Radio Frequency (RF) Devices:** Semiconductors are crucial in RF circuits used in wireless communication systems, including Wi-Fi, Bluetooth, cellular networks, and satellite communications.

Conclusion:

To realize the significance of the semiconductor industry for India, **the government, industry stakeholders, and academia need to collaborate** to create an ecosystem that encourages research and innovation, provides supportive policies and incentives, and to promote an environment conducive to the growth of the semiconductor sector.

1.5 MISSION ON ADVANCED AND HIGH-IMPACT RESEARCH (MAHIR)

Latest Context

A national mission called **"Mission on Advanced and High-Impact Research (MAHIR)"** was recently created by the **Ministries of Power and New and Renewable Energy.**

- The Mission will follow the technological life cycle method of Idea to Product during **its first five-year span from 2023–2024 to 2027–2028.**

Key Highlights of the National Mission MAHIR

Objectives:

- To find developing technologies and fields that will be important for the global power industry in the future and develop them locally.
- To give key players in the power sector a forum for group brainstorming and collaborative technology development.
- To encourage the commercialization of indigenous innovations created by Indian start-ups and to assist their pilot initiatives.
- To make use of international collaborations and alliances for advanced technology transfer and research.
- To encourage research and development (R&D) in the electricity sector and to establish an innovative environment.
- To establish India as a world leader in the creation of applications and technology for power systems.

Fund:

- **The Ministry of Power, Ministry of New & Renewable Energy, and Central Public Sector Enterprises under these ministries will combine their funds to pay for it.**
- If further money is needed, it will be raised from the budgeted funds of the Indian government.

Regions Selected for Research under MAHIR:
1. Green hydrogen for mobility (High Efficiency Fuel Cell).
2. Carbon capture.
3. Alternatives to Lithium-Ion storage batteries.
4. Modifying electric cookers/pans to suit Indian cooking methods.
5. Geo-thermal energy.
6. Indigenous CRGO technology.
7. Solid state refrigeration.
8. Nano technology for EV battery.

What is the Structure of the Mission?

Two- Tier Structure:
- It consists of a **Technical Scoping Committee and an Apex Committee**.

Apex Committee:
- It reviews research ideas, decides on technology and product development, and considers foreign partnerships.
- The Apex committee will investigate foreign partnerships as well. The Apex Committee will offer its ultimate approval of all research proposals and programmes.
- The Union Minister for Power, New, and Renewable Energy serves as its chairman.

Technical Scoping Committee:
- It pinpoints new research fields, suggests technology options, and keeps track of accepted research initiatives.
- **The Central Electricity Authority's chairman serves as its chair.**
- The Apex Committee and Technical Scoping Committee would get the required secretarial support from the Central Power Research Institute **(CPRI), Bengaluru.**

Scope of the Mission
- The world will be encouraged to submit applications for outcome-linked funding after study areas have been selected and approved.
- The proposals will be chosen on a **quality-cost-based selection (QCBS)** basis.
- There will be funding for pilot projects of technology created by Indian start-ups, and there will be assistance with their commercialization.
- Technology transfer and international cooperation will be promoted.

Importance of the MAHIR

Indigenous Development:
- India can lessen its dependency on imports, increase self-sufficiency, and foster local innovation and industrial capabilities by creating sophisticated technology within the nation.
- It supports the "Make in India" strategy and aids in the expansion of domestic technology-based enterprises.

Energy Transition and Net Zero Emissions:
- Energy storage options, carbon capture strategies, and cleaner, greener energy sources may all be supported by MAHIR.
- This strengthens India's resolve to fight climate change and make the transition to a sustainable energy future.

Economic Growth and Manufacturing Hub:
- India is to become a manufacturing powerhouse for cutting-edge power technology, according to MAHIR.
- Innovative industries may be supported, investments can be attracted, jobs can be produced, and so on by creating and implementing cutting-edge technology.

1.6 CENTRAL GOVERNMENT AMENDS ELECTRICITY (RIGHTS OF CONSUMERS) RULES, 2020

Latest Context

Through an amendment to the Electricity (Rights of Consumers) Rules, 2020, the Government of India has made **two amendments** to the current power tariff scheme. The new **Time of Day (ToD) Tariff** and the **regulations for smart metres** have been streamlined.

Introduction of Time of Day (ToD) Tariff
- The **price of energy** will fluctuate depending on the time of day rather than being charged at the same rate throughout the day.
- **Under the ToD Tariff scheme,** rates will be 10%–20% lower during solar hours (the eight-hour period of a day determined by the State Electricity Regulatory Commission), while rates will be 10%–20% higher during peak hours.
- **Starting on April 1, 2024**, the ToD rate would apply to commercial and industrial customers with maximum demand of 10 KW or more, and starting on April 1, 2025, to all other customers excluding agricultural customers.
- **For users who have smart metres**, the Time-of-Day price must go into effect as soon as the smart metres are installed.

Changes made in smart metering provision
- The previous fines for exceeding the maximum permitted load or demand by consumers have been decreased to prevent consumer discomfort or harassment.
- **According to the metering provision's change,** a consumer will not be penalised after having a smart metre installed based on the maximum demand the smart metre recorded during the time leading up to the installation date.
- **The process for load revision** has also been rationalised such that the maximum demand will only be increased if the sanctioned load has been exceeded at least three times in a fiscal year.
- **Additionally, smart metres** must be scanned remotely at least once per day, and the data must be made available to consumers so they may make educated choices about their power usage.

1.7   PRODUCTION-LINKED INCENTIVES (PLI) SCHEME

Latest Context

It has been decided by the Government not to launch the Production-Linked Incentives (PLI) Scheme for new sectors and will review the need for course correction for some sectors.

PLI Scheme: Government of India introduced this scheme in March 2020 for producers in order to provide special incentives to promote manufacturing in multiple sectors.

- These incentives have been linked with the **performance of the organization**. In other words, the government will provide these incentives on an **incremental basis.**
- It is formulated on the foundation of multiple sectors with an outlay of **Rs. 1.97 lakh crore** in March 2020 to strengthen their productional capabilities and create global champions.

Objectives of the PLI Scheme

Transform India into a **manufacturing hub by creating the global champions**

Increase Investments in **manufacturing and innovation**

Acheive Self Relaiance with globally competeitve domestic manufacturing

Advantages of PLI Schemes

- **Capital Expenditure:** Its implementation will result in potential capital expenditure (Capex) of Rs 2.5-3 lakh crore over the scheme period.
  - It will constitute approximately **13-15% of the average annual investment spending** in key industrial sectors.

- **Strengthening Manufacturing Sector:** It is estimated that it will directly affect the **capacity expansion**
    - It will significantly restructure India's domestic manufacturing which will increase its share up to **25 %.**
    - In addition, it will also improve the quality of industrial infrastructure which will benefit **the overall supply chain ecosystem**.
    - **Spur Green Investment:** Under this scheme, approximately 55% of the scheme is expected to be in green sectors like solar photovoltaics, electric vehicles etc.

> **Achievements of PLI Schemes**
>
> - Significant increase of 76% in FDI in the Manufacturing sector in FY 2021-22
> - Export boosted by Rs. 2.56 Lakh Crore
> - Employment generation of around 3,25,000
> - Actual Investment of Rs.62,000 Crore has been realized till March 2023
> - Import Substitution of 60% has been achieved in the Telecom Sector

- **Self-reliance and increase in exports:** It will bridge the gap between the highly skewed Indian import-export basket that is identified with the heavy imports of raw materials and finished goods.
    - One of the important benefits of this it will help in reducing the **impact of geopolitical impact** on food, fertilizer, and crude oil prices.

- **Faster adoption of technology:** It will facilitate in adopting the advanced technology at a very fast pace. For instance, in telecom and networking products, its timely intervention will help in the faster adoption of 4G and 5G products across India.
- **Improving regional balances in development:** PLI will facilitate the **smooth implementation of region-specific incentives** for promoting industrial development in underdeveloped or backward regions.
- **Others benefits**
    - It will assist in implementing **India's abundant human capital** and will play a critical role in **upskilling** the labour force.
    - It will substitute **technologically obsolete machinery** and make the manufacturing sector more globally competitive.
    - It will result in better productivity and will create a thrust in free trade agreements for better market access.

Sectors under PLI

- Drones
- Medical Devices
- Auto and auto components
- Mobile and Electronic Components
- Pharma Drugs
- Food Products
- Drones Components
- Textiles
- Electronics and IT Hardware
- Solar Photovoltaic Modules
- Specialty Steel
- White Goods
- Pharma: API and KSM
- Telecom and Networking
- ACC Battery

Challenges

- **Ambiguity around the incentives:** It lacks the mechanism through which incentives are to be awarded which may cause ambiguity. In addition, no set criteria or common parameters for offering these incentives.
- **Lack of emphasis on critical factors:** Efficient functioning of the manufacturing sector depends on multiple factors like raw materials, the size of the domestic market, and the relationship between upstream and downstream manufacturers etc.

o Providing subsidies under this scheme for scaling up sector-specific manufacturing will not work until required attention is paid to other critical factors that shape the ecosystem

o Moreover, some schemes are not conducive to improving the manufacturing sector. The reason is that they have been designed to accommodate many players (over 50 in many cases), rather than a few champions which will be very harmful to the productivity of this sector.

- **Reduced Efficiency of the Manufacturing industry in the absence of Subsidies:** In case, if these incentives/ subsidies are withdrawn at a later stage, it may ultimately lead to industrial inefficiencies and cause a decline in productivity both at sectoral and firm-level.

- **Major Emphasis on large firms**: This scheme lays emphasis on large industries like automobiles, electronics and technical textiles are largely constituted by big firms which is not justiciable as per the actual configuration of the Indian industrial structure, which is largely composed of MSMEs.

- **Very Difficult in Evaluation**: Absence of a **centralised database** for collating the data and required information like an increase in production or exports makes the evaluation process difficult. Moreover, this kind of ambiguity will seriously jolt the transparency and ultimately can lead to malfunctioning, which in turn will further widen the fault lines and consequently weaken the policy structure.

Way Forward

- **Ensure smooth implementation:** For securing efficient implementation of the PLI scheme, there is a dire need to take steps such as reducing bureaucratic hurdles and simplifying application processes can be considered.

- **Regular Evaluation:** Continuously monitoring and evaluating the PLI scheme outcomes may help in finding areas for improvement and making necessary adjustments to achieve the goal.

- **Focus on MSMEs:** Emphasis should be given to create separate provisions within the PLI scheme to incentivize Micro, Small, and Medium Enterprises (MSMEs).

- **Enhanced Collaboration:** There must be **dynamic collaborations** between industry players, research institutions, and academia to foster innovation, research, and development.

- **Strengthening institutional mechanism:** For smooth and targeted implementation, a strong, technically evolved, institutional mechanism accountable to the highest levels of governance is necessary.

1.8 FERTILIZERS SECTOR IN INDIA

Latest Context
Recently, a unique package of innovative schemes for farmers with a total outlay of Rs.3.70 Lakh crore has been approved by the Cabinet Committee on Economic Affairs (CCEA).

Key Highlights of the Schemes

- **PM Program for Restoration, Awareness Generation, Nourishment and Amelioration of Mother -Earth (PM-PRANAM)**

🌿 **India's Fertilizer Sector**
• India is **2nd largest** fertilizer-consuming country after China in the world.
• India is **3rd** largest producer.
• India is the **world's largest importer**

was announced in Budget 2023-24 to incentivize States/UTs for promoting alternate fertilizers and balanced use of chemical fertilizers.

- For promoting Organic Fertilizers from GOBAR-Dhan (Galvanizing Organic Bio-Agro Resources- Dhan) Plants, Rs. 1452 crore has been approved for Market Development Assistance (MDA)
  - To positively affect village cleanliness and generate wealth and energy from cattle and organic waste, in 2018, under **Swachh Bharat Mission (Grameen), GOBAR-Dhan** was launched (SMB-G).
  - Injection of **Sulphur coated Urea (Urea Gold),** for the first time, for addressing soil sulphur deficiency and saving farmers' input costs.
  - **Urea Gold** is more economical and efficient than the currently used Neem-coated
  - In order to maximize indigenous production of urea to reach self-sufficiency levels by 2025- 26, **Urea Subsidy Scheme** which is Central Sector Scheme has been extended for another three years till March 2025.

Significance of approved group of Schemes
- Main concern of these schemes is to focus on the overall well-being and economic betterment of farmers by promoting sustainable agriculture.
- Through these schemes, farmers' income will be increased. More importantly, these schemes will strengthen natural/organic farming, rejuvenate soil productivity, and ensure food security.
- Better utilization of crop residue like para la through these schemes will help in resolving air pollution, improve cleanliness and help to convert waste into wealth.

Fertilizer Industry in India: Fertilizers are meant to provide plants with sufficient nutrients that are deficient in soils. It is a chemical product that is either mined or manufactured. It is one of the **eight core industries**.
- Urea constitutes over **2/3rd of overall fertiliser consumption**. The need for potash is fulfilled through imports.
- **Fertilizers** are sliced as **Primary, Secondary and Micronutrients**.
  - On the type of nutrients, they supply to the soil such as nitrogenous (urea), phosphatic (Di-Ammonium Phosphate (DAP)) and potassic (muriate of potash (MOP)) fertilizers, Primary fertilizers are further classified.
  - **Secondary fertilizer** comprises calcium, magnesium, and Sulphur while micronutrients include iron, zinc, boron, chloride etc.

Concerns related to Fertilizers
- **Soil degradation:** Overuse of urea negatively impacts **soil fertility, and crop quality,** and can lead to pest and insect attacks. In addition, plants get damaged because of decreased fertility and toxicity of ammonia, and the carbon dioxide released from urea degradation.
- **Environmental pollution:** Overuse of fertilizers that contains substances such as **nitrates and phosphates** can lead to Eutrophication. Further, it causes algal bloom, oxygen depletion, and harms aquatic life (death of fish and other aquatic flora), thereby disrupting the food chain and ecosystem balance. Use of Nitrogen-based fertilizers causes the emission of nitrous oxide, a potent greenhouse gas, causing climate change.
- **Human Health**: Pollution from vehicles combined with agricultural ammonia emissions create dangerous particulates in the air that causes respiratory diseases.

Nitrates and phosphates chemicals that exist in fertilizers can percolate to groundwater and contaminate drinking water sources thus, increasing the risk of cancer in adults.

- **Fiscal Burden:** Subsidy for providing fertilizer to farmers leads to a huge fiscal burden on the state. For instance, the total fertilizers subsidy stood at Rs 1.62 lakh crore in 2021-22.
- **Promoting inefficiency:** On the basis of the cost of production, the subsidy of a firm is determined. Higher cost leads to higher subsidy that results in inefficient firms with high production costs surviving and the incentive to lower costs is blunted.
- **Import dependency:** Overuse of fertilizers has become the main reason for India to become the top importer of urea. Presently, it imports an average of 7 million tonnes of its annual Diammonium Phosphate (DAP) needed to feed its huge agriculture sector.
- **Limited awareness:** The absence of soil testing, and scientific application of fertilizer along with a lack of awareness regarding the balanced use of nutrients leads to their indiscriminate use and hampering soil quality in the longer run.

Way Ahead

- **Promote Local Production:** Attention should be paid to **promoting the establishment of production units** for decreasing reliance on imports by lowering the import duty on phosphoric acid and ammonia.
- **Sustainability:** Government must encourage the **use of bio and organic fertilizers and incentivize farmers** to shift from chemical fertilizers to environmentally friendly fertilizers.
- **Soil testing:** There is a need to provide access to **affordable soil testing facilities and encourage farmers to regularly test soils** to determine nutrient levels and rationalise the use of fertilizer accordingly.

> **Initiatives Taken for Efficient Use of Fertilizers**
>
> - **One Nation One Fertilizers scheme** of Ministry of Chemicals and Fertilisers under **Fertilizer Subsidy Scheme** named **"Pradhanmantri Bhartiya Janurvarak Pariyojna"** (PMBJP) for securing timely supply of fertilizers.
> - **Nano Urea (Liquid) Plants** has been set up to boost productivity and help increase their income.
> - Department of Fertilizers constituted **Fertilizer Flying Squads** (FFS) for stopping diversion and black marketing.
> - **Nutrient Based Subsidy scheme**: Under this, a certained rate of subsidy (in Rs. per Kg basis) is announced on nutrients namely Nitrogen (N), Phosphate (P), Potash (K) and Sulphur (S) by the government on annual basis. It is applicable to 22 fertilizers (other than Urea) for which MRP will be decided taking into account the international and domestic prices of P&K fertilizers, exchange rate, and inventory level in the country.
> - **Soil Health Card scheme** offers **crop-wise recommendations** of nutrients and fertilizers required for the individual farms.

- **Efficient use:** Government must pay attention to **improving fertilizer efficiency through need-based use**. Nano urea that has been recently developed by IFFCO shows promising results in reducing the usage of urea. Such products need to be encouraged at a very fast pace after testing.
- **Awareness:** Attention must pay to organise awareness campaigns to educate farmers on appropriate fertilizer use, the negative environmental impacts of overuse on productivity and soil fertility, and promote sustainable agricultural practices.

- **Research and Development:** sufficient investment should be made in R&D for developing fertilizer delivery systems that promote fertilizer efficiency, and slow-release fertilizers to improve nutrient use efficiency.

1.9 REGULATION OF START-UP ECOSYSTEM

Latest Context

Recently, experts have pointed out the need for self-regulation which is very essential for the start-up environment to thrive.

Start-up: It refers to a company in the initial stages of operations driven by **ideas, risk-taking, innovation,** and can-do spirit.

Measures of the Government to Develop start-ups Ecosystem

- **Start-up India** and **Stand-up India**
- **Startup India Seed Fund Scheme (SISFS)** in order to provide early-stage assistance
- Onboarding of Startups on Government- e- Marketplace (GeM)
- Proffering global market access by way of inter-governmental cooperation
- Support IPR Protection with fast-tracked patents and simplified rules.

> **Current Status of India's Startup Ecosystem**
> - Presently, India has the world's **3rd largest start-up ecosystem** in the world.
> - Presently, there are **80,000** Department of Promotion and Industry and Internal Trade (DPIIT) recognized units comprising **100 plus unicorns**
> - In terms of **tech startups,** India is **2nd largest ecosystem** in the world.
> - Approximately 40% of start-ups belong to **tier-II** and **tier-III** cities.

Regulation of Startup Ecosystem in India

- Through an executive order under the Companies Act 2013, the Ministry of Corporate Affairs (MCA) has defined "start-up" and provides **few operational and compliance relaxations** for a "start-up company".
- A business as a start-up (as part of Start-up India) is recognised by the Department of Promotion and Industry and Internal Trade (DPIIT) (under the Ministry of Commerce & Industry. This recognition grants **tax exemptions for 3 years**.
- As far as rules and regulations are concerned, the **Securities and Exchange Board of India** (SEBI) **notifies rules** for listing start-ups.
- The central Bank formed a **dedicated helpline for start-ups in India** in order to offer **guidance/assistance** for undertaking cross-border transactions within the ambit of the regulatory framework.

Problems in Regulatory Framework

- **Incorporation:** To from a company in India is a very complex and tedious task. It is also a time-consuming process that takes 2-3 months on average contrary to **Singapore's 2-day average**.
  - Due to the complex compliance mechanism, there is a lot of **Compliance Burden** on the company owner for obtaining licenses, permits etc. which is a time-consuming and resource-intensive process.
- **Regulation**: In India, startups counter many regulatory challenges like dispute resolution due to frequent policy changes etc. which makes very difficult for start-ups to plan and operate their businesses effectively.

- **Funding Problem:** In an early stage, Indian start-ups face funding problems as Venture Capital firms target established start-ups. Due to financial restrictions like the prohibition on raising funds through convertible notes, and limits on Foreign Direct Investment (FDI), funding new businesses in India is difficult.
- **Intellectual Property (IP):** Moreover, Start-ups face many problems in saving their IPRs as enforcement of IPRs is time-consuming and costly, and start-ups may face difficulties in combating infringement disputes.
- **Taxation:** Although there are a lot of tax benefits for start-ups, they face problems regarding tax compliance, especially when it comes to issues like transfer pricing, valuation of shares, and taxation of angel investments etc.

Way Forward

- **Sandbox approach**: Setting up **regulatory sandboxes** that could permit start-ups to test innovative products or services in a controlled environment, granting temporary regulatory exemptions is the need of the hour. For instance, the FinTech regulatory sandboxes are created by RBI from time to time.
- **Easy Access to Funding:** Formulating a comprehensive and precise business policy emphasizing vision, objectives, and growth potential may help in attracting venture capitalists and angel investors etc. Moreover, innovative funding ideas like crowdfunding can be encouraged and supported.
- **Regulatory Research to keep up with Start-ups:** Organising in-depth research on relevant regulations, seeking legal counsel, maintaining transparency and compliance, and utilizing technology to streamline processes can help to overcome regulatory obstacles.
- **Multi-Stakeholder approach:** This approach can be used to influence policy by combining industry associations, enhancing coordination between government agencies and stakeholders, and advocating for regulatory reform to address issues like the entry-exit problem.
- **Intellectual Property Protection:** Speeding up the patent examination, establishing IPR facilitation centres and awareness generation can enhance the IP protection framework.

1.10 INVESTOR SERVICES FUND (ISF) AND INVESTOR PROTECTION FUND (IPF)

Latest Context

Recently, comprehensive guidelines for the Investor Protection Fund (IPF) and Investor Services Fund (ISF) maintained by stock exchanges and depositories have been issued by the Securities and Exchange Board of India (SEBI).

Background: To examine India's investor protection regulatory framework, the Supreme Court (SC) announced an expert committee earlier. In addition, the Court also suggested measures to strengthen Indian investor awareness as per the risks and vulnerabilities of the system like frauds with investors, high-risk investments and market manipulations. In this context, SEBI has announced regulatory reforms for the establishment of IPF and ISF.

Investor Protection Fund (IPF)

- **Objective:** Its goal is to **safeguard the interests of participants** (**like stockbrokers and investors**) of the Exchange.

- **Establishment:** an IPF will be set up by all stock exchanges and depositories.
- **Administration:** Through **separate trusts** created for the purpose, the IPF of the stock exchange and depository shall be administered.
  - ✓ The **IPF Trust of the stock exchange and the depository** shall consist of **five trustees**.
  - ✓ Three public interest directors,
  - ✓ One representative from SEBI recognized investor associations and
  - ✓ Chief Regulatory Officer (CRO) or Compliance Officer (CO)
- **Tenure:** There shall be the maximum tenure of a trustee excluding CRO or CO shall be **five years** or as specified by **SEBI.**
- **Segregated funds:** The stock exchange and depository shall guarantee that the funds in the IPF are well segregated and that their IPF is immune from any liabilities of the stock exchange and depository respectively.
- **Review:** A **half-yearly review** to ascertain the adequacy of the IPF corpus will be conducted by the stock exchanges and depositories.

> **KNOW THE TERM**
>
> - **Depository:** A depository is a financial organisation that accepts deposits from businesses, individuals, and selling financial institutions like stocks, and bonds. For instance: Central Depository Services (India) Limited, National Securities Depository Limited (NSDL).

	Contribution to IPF	Utilization of IPF
Stock Exchange	• 1% of the listing fee received. • 100% of interest earned on a 1% security deposit kept by the issuer companies at the time of offering of securities for subscription to the public. • Penalty collected from Trading Members and from listed companies for non-compliance with SEBI regulations. • At least 70% of interest or income received out of any investments made from IPF.	• To meet the legitimate investment claims of the clients of the defaulting Trading Managers (TMs). • To pay interim relief to investors.
Depository	• 5% of their profits from depository operations. • All fines and penalties from Depository Participants and other members. • Interest or income received out of any investments made from the IPF.	• Promotion of investor education and investor awareness programmes aimed at enhancing securities market literacy and promoting retail participation in the securities market. • To meet the legitimate claims of the beneficial owners.

Investor Services Fund (ISF): Its objective is to provide **different kinds of services** to the investing public such as investor education and awareness programs, dissemination of companies' information etc.

- **Funding:** For providing services to the investing public, the stock exchange shall keep aside at least **20% of the listing fees** received for ISF.
- **Supervision:** Its supervision rests with the **Regulatory Oversight Committee**.
    - The Regulatory Oversight Committee is **one of the seven committees** for **Market Infrastructure Institutions (MIIs)** specified by Stock Exchanges and Clearing Corporations) Regulations, 2018.
- **Utilization of ISF of Stock Exchange**
    - Promotion of investor education and investor awareness programmes.
    - At least 50% of the corpus should be spent at Tier II & Tier III cities.
    - Cost of training of arbitrators.
- **Transfer of un-utilized IPF/ISF:** If a stock exchange or a depository is wound up or derecognized or exits, then the balance in the IPF and/or ISF lying un-utilised with the stock exchange and depository shall be transferred to **Investor Protection and Education Fund (IPEF)** of SEBI.

> **KNOW THE TERM**
> - **Market Infrastructure Institution (MII):** A **financial entity** that proffers essential infrastructure for running the daily operations in the Stock Market/Capital Markets. Stock exchanges and clearing houses are all MIIs.

Investor Protection and Education Fund (IPEF)

- In 2007, it has been established by SEBI and is regulated under the **SEBI (IPEF) Regulations 2009**.
- It is used for the protection of investors and the promotion of investor education and awareness.
- It is funded by contributions made by grants and donations by central government or state governments, SEBI, security deposits and amounts in IPF/ISF of derecognized stock exchanges etc.

Conclusion

The regulations regarding IPF and ISF have paved the way for a financially aware and institutionally protected investor. To move forward, these steps can be complemented with improvement in financial literacy and market transparency.

1.11 MIDDLE-CLASS IN INDIAN ECONOMY

Latest Context

Recently, experts highlighted the point that a **large, expanding, and increasingly prosperous genuine middle class is needed** for achieving the country's economic ambition.

Reasons for the Significance of the Middle Class:

- **Economic engine:** The middle class serves as the backbone of the economy. They are the major consumers of goods and services, which drives demand and stimulates economic growth. Their spending power contributes to business expansion, job creation, and increased investment opportunities.

- **Social stability:** A robust and thriving middle class fosters social stability. When people have access to basic necessities, education, and opportunities for upward mobility, they are less likely to resort to crime or engage in social unrest. A stable middle class can help reduce inequality and create a more harmonious society.

> **Middle Class in India**
>
> **Definition:** It refers to a class in society that in the socio-economic sense exists **between** the **working** and **upper class**.
>
> **Proportion of Total Population:** Presently, 31% of the total population is the middle class as per the People Research on India's Consumer Economy (PRICE) and India's Citizen Environment Report. Currently, it holds a **quarter of the country's wealth**.
>
> **After 1991 Reforms:** After the economic reforms of 1991, the size of the middle class expanded substantially. In the early 1990s, it constituted **less than 1% of the total population.** In the present scenario, the current middle class which is characterized by **consumer-driven sentiment** is playing a crucial role in shaping the present era.

- **Purchasing power:** The middle class's purchasing power has a significant impact on the market. Their demand for goods and services creates a competitive marketplace, leading to better products and more competitive prices. This, in turn, benefits people across all income levels.
- **Innovation and entrepreneurship:** The middle class often forms the backbone of innovation and entrepreneurship. They are more likely to have access to education and resources, enabling them to start new businesses and drive innovation in various sectors. This, in turn, generates employment opportunities and boosts economic growth.
- **Tax base:** The middle class contributes significantly to government revenue through taxes. A strong middle-class tax base allows governments to invest in public services such as education, healthcare, infrastructure, and social welfare programs, which further support the overall well-being of society.

Challenges Faced by Middle Class
- **Rising cost of living:** Expenses for housing, healthcare, education, and other essential goods and services have been increasing faster than income growth, putting financial strain on middle-class families.
- **Healthcare costs:** The increasing cost of healthcare and health insurance can be a significant burden for middle-class families, especially when unexpected medical issues arise.
- **Education expenses:** College tuition and student loan debt have been rising, making it challenging for middle-class families to afford higher education for their children without accumulating substantial debt.
- **Income inequality:** The widening income gap between the middle class and the wealthy can lead to feelings of economic insecurity and frustration.
- **Access to quality healthcare and education:** Middle-class families might not qualify for some government assistance programs but still struggle to afford essential services like healthcare and education.
- **Financial planning and debt management:** Balancing day-to-day expenses, saving for the future, and managing debt can be challenging for middle-class households.

- **Lack of social mobility:** Limited opportunities for upward mobility can hinder middle-class individuals from moving into higher income brackets and achieving greater financial stability.
- **Family and work-life balance:** Middle-class families often face pressure to juggle work responsibilities and family life, which can lead to stress and burnout.

Way Forward

- **Affordable Healthcare:** Implementing or improving universal healthcare systems can reduce the burden of medical expenses on the middle class. Affordable access to quality healthcare ensures that families don't face financial hardships due to unexpected medical emergencies.

> **Informalization and Low-productivity trap**
>
> - The nature of temporary or contract workers in the informal economy disincentivises the employer from investing in productivity-enhancing tools and training workers to use them besides.
> - Also, the conditions in the informal sector are such that workers are trapped in situations where they are unable too
>   - Increase productivity and income by working with better tools
>   - Get access to easy learning of new skills,
>   - Get the effort-multiplier benefit of teamwork, and
>   - Access the full suite of reasonably priced and regulated financial services.
>   - This creates a vicious inter-generational cycle of low productivity – low income – poor socio-economic status.

- **Quality Education:** Investing in public education and making higher education more affordable can enhance the skills and opportunities available to the middle class, enabling upward mobility and reducing the burden of student loan debt.
- **Income Growth and Job Security:** Policies that promote job growth, fair wages, and worker protections can boost middle-class income and provide stability in the job market.
- **Tax Reform:** Tailoring tax policies to benefit the middle class by offering tax credits, deductions, or progressive tax rates can reduce the income gap and provide economic relief.
- **Retirement Security:** Strengthening social security systems and offering retirement savings incentives can ensure that middle-class individuals have financial security during their retirement years.
- **Childcare and Family Support:** Implementing affordable and accessible childcare solutions can help working parents balance family and work responsibilities.
- **Reducing Debt Burden:** Promoting financial literacy and providing programs to alleviate high consumer debt can improve the financial well-being of the middle class.
- **Infrastructure Investment:** Investing in infrastructure projects can create jobs and stimulate economic growth, benefiting the middle class.
- **Investing in Technology and Skills:** Encouraging the development of cutting-edge technologies and providing opportunities for reskilling and upskilling can help middle-class workers stay competitive in the job market.

1.12 RAILWAY SAFETY IN INDIA

Latest Context

Recent, train accident in the Balasore District of Orisha raised the railway safety in India.

Railway Accidents in India

- As per the **National Crime Records Bureau**, on average 23,000 people died every year between 2010 and 2021 in railway accidents.
- NCRB sliced railway accident deaths **into five categories** namely, collisions, explosions/fire derailments, people falling from trains or trains colliding with people on tracks, and 'other causes'.

> 🚆 **Indian Railways**
>
> - Indian Railway is the world's 4th largest railway network, after the **US, China,** and **Russia** with the entire track covering a route length of 67,368km.
> - Indian Railway is the **world's second-largest network** operated **under a single management.**
>
> **Railway Safety Ecosystem in India**

Operational Level	Administrative Level
• Fire Extinguisher • Track Management System • Kavach • HOTS-3X for Track Safety • Track Recording Car • Bridge Management System • Electronic Interlocking and Ultrasonic Flaw Detection	• Commission of Railway Safety (CRS) • Railways' Depreciation Reserve Fund (DRF) • Rashtriya Rail Sanrakshak Kosh • Railway Protection Force (RPF)

Reasons for Shortcomings in the Safety of Indian Railway: CAG's Report released in December 2022, found the following drawbacks in the safety of Indian Railways

- **Shortfalls in Inspection:** As per the Report, there are significant deficiencies in inspections conducted by Track Recording Car. Inspections were found to have shortfalls ranging from 30% to 100%
- **Insufficient Use of Dedicated Railway Fund:** According to the report, the dedicated railway fund meant for priority tasks was not effectively utilized. It pointed out the failures to use funds for essential safety-related activities.
- **Decline in Funding for Track Renewal:** Report pointed out a reduction in funding for track renewal that plays a vital role in maintaining the safety and integrity of railway tracks. Lack of required funding in this realm can lead to the deterioration of the track and enhances the derailment risks.
- **Insufficient Staffing in Safety Operations:** It also pointed out the insufficient staffing in safety operations as a serious concern. Inadequate manpower may affect the timely execution of safety-related tasks and compromise the overall safety of the railway system.
- **Costs of Derailments:** It highlighted the costs of derailments to be around Rs 32.96 crore. It comprises the financial impact of accidents across 16 railway zones and the associated damages and losses.
- **Non-operational Track Management System (TMS)**: It is a web-based application for online monitoring of track maintenance activities that was found to be non-operational. **In-built monitoring mechanism** of the TMS portal was not functioning, and information related to the closure of inspection notes was not filled in the portal.

- **Link between derailments and track renewals:** It pointed out that of the 1,127 derailments that occurred during 2017-2021, around 289 derailments (26%) were linked to track renewals. That shows the significance of adequate investment in track maintenance and renewal to prevent accidents

Steps Taken for Railway Safety

- **Rashtriya Rail Sanraksha Kosh (RRSK)**: It is a safety fund for critical assets that was established in **2017-18** with a **fund of Rs 1 lakh crore over a period of five years** for very vital safety-related works like track renewals, signaling projects, and bridge rehabilitation, etc.
- **Technological Upgradation:** It is related to improving the design and features of coaches and wagons. It comprises **Modified Centre Buffer Couplers**, **Bogie Mounted Air Brake System** (BMBS), improved suspension design and provision of Automatic fire & smoke detection system in coaches. Moreover, it also comprises **installing KAVACH** - an **indigenously developed Automatic Train Protection (ATP).**
- **LHB Design Coaches:** It refers to **Lighter and safer coaches** for **Mail/Express trains**. Based on German technology, they have better **anti-climbing features**, **fire retardant materials**, higher speed potential and longer service life than conventional ICF design coaches.
- **GPS-based Fog Pass Device**: To support loco, pilots navigate in foggy conditions. It is equipped with a GPS-enabled hand-held device which displays acurate distance of the approaching landmarks such as signals, level crossing gates, etc has been introduced. It also alerts the loco pilot with a loud buzzer when the train approaches a signal or a level crossing gate.
- **Modern Track Structure:** It refers to **stronger and more durable tracks** and **bridges**. It comprises using a **Prestressed Concrete Sleeper (PSC)**, **higher Ultimate Tensile Strength (UTS)** rails, fan-shaped layout turnout on PSC sleepers, Steel Channel Sleepers on girder bridges, etc.
- **Ultrasonic Flaw Detection (USFD):** It is a technique for detecting and removing faulty rails. To inspect the rails for cracks, defects or flaws that may cause derailments or accidents, a non-destructive testing method that uses high-frequency sound waves has been introduced. The defective rails are then removed and replaced with new ones.
- **Mechanization of Track Maintenance:** It refers to a system to automate and optimize track maintenance. It comprises using of machines like track tamping machines, ballast regulating machines, and dynamic track stabilizers to carry out track maintenance activities like tamping, dressing, stabilizing, etc. It reduces human errors and improves track quality and safety.
- **Interlocking System:** It connotes a system to control points and signals centrally. Interlocking System is a system that utilizes electrical or electronic devices in order to operate the points and signals from a central location. It reduces the need for **manual operation of points** and **signals by staff** on the ground. It also reduces the chances of human failure and enhances safety.
- **Elimination of Unmanned Level Crossings (UMLCs):** UMLCs are being eliminated progressively by closing, merging, manning, or providing subways/road under bridges/road over bridges.

Way Forward

- **Advanced Signaling Systems**: Implementing modern signaling systems like Automatic Train Protection (ATP) and Train Collision Avoidance System (TCAS) can significantly reduce the risk of collisions and human errors. These systems can automatically control train movements, ensuring safe distances between trains and preventing over speeding.

- **Regular Maintenance and Upgrades:** Regular maintenance and timely upgrades of tracks, bridges, and other infrastructure are crucial to ensure the railway network's safety. This includes addressing wear and tear, identifying weak spots, and promptly fixing any issues.

- **Safety Inspections and Audits:** Conduct frequent safety inspections and audits of railway tracks, rolling stock, and signalling systems to identify potential hazards and address them before accidents occur.

- **Training and Skill Development:** Provide comprehensive training to railway staff, including train drivers, maintenance personnel, and station staff, to ensure they are well-equipped to handle emergency situations and follow safety protocols.

- **Passenger Awareness:** Educate passengers about safety measures and the importance of adhering to railway safety guidelines. This can be done through announcements, posters, and multimedia campaigns at railway stations and inside trains.

- **Disaster Preparedness:** Develop comprehensive disaster management plans to handle emergencies effectively. Conduct regular drills and exercises to train railway staff and authorities to respond swiftly in case of accidents.

Kavach

- It is indigenously developed India's automatic protection system in development, under the name Train Collision Avoidance System (TCAS) that was recoined as Kavach or "armour"

- It is indigenously developed by the Research Design and Standards Organisation (RDSO) in collaboration with the Indian industry.

- It is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4) standards.

- **Key features:**
  - o It Provides protection by preventing trains to pass the signal at Red (which marks danger).
  - o Activates the train's braking system automatically if the driver fails to control the train as per speed restrictions.
  - o Prevents the collision between two locomotives equipped with functional Kavach systems.
  - o Relays SoS messages during emergency situations.
  - o It has centralised live monitoring of train movements through the Network Monitor System.
  - o In Kavach, the probability of error is 1 in 10,000 years.

Functioning of Kavach:

- The tracks contain radio-frequency identification (RFID) tags that are fitted on each section of a track and provide information directly to the locomotive TCAS unit inside the train.

- There is also a Stationary TCAS unit installed at stations with a radio tower to communicate with nearby locomotives. o When a train passes two RFID tags sequentially, its direction and speed can be determined.

- When an approaching signal is red, the Stationary TCAS will relay the information to Loco TCAS, slowing down and stopping the train. If the loco pilot is unable to do so, automatic brakes are applied.

- **Encourage Research and Innovation:** Invest in research and innovation to develop new safety technologies and practices that can further enhance railway safety in India.
- **Public-Private Partnerships:** Explore public-private partnerships to bring in expertise and resources for implementing safety measures and modernizing the railway network

1.13 ROAD SAFETY IN INDIA

Latest Context

Recently, guidelines have been issued by the National Highways Authority of India for rectification of accident-prone spots on the National Highways by implementing short-term measures.

Key Highlights

- NHAI Project Directors can undertake rectification of accident-prone spots **up to Rs. 10 lahks** per spot. These kinds of accident-prone spots are identified and recommended by the **respective State Police Chief** or by the **District Road Safety Committee**.
- Short-term measures that are having **cost more than Rs.10 lakhs** and up **to Rs. 25 lakhs** have been delegated to the concerned **Regional Office**.
- Short Term Measures comprise the **installation of pedestrian facilities** such as **zebra crossings** with advance warning signs, Crash barriers & railings, solar lights/ blinkers, etc.

> **KNOW THE TERM**
>
> **Blackspots:** It is a Road Accident Black Spot having a stretch of **500 m stretch** on a National Highway
>
> o Either **5 road accidents with** fatalities /grievous injuries took place in the last 3 years, or,
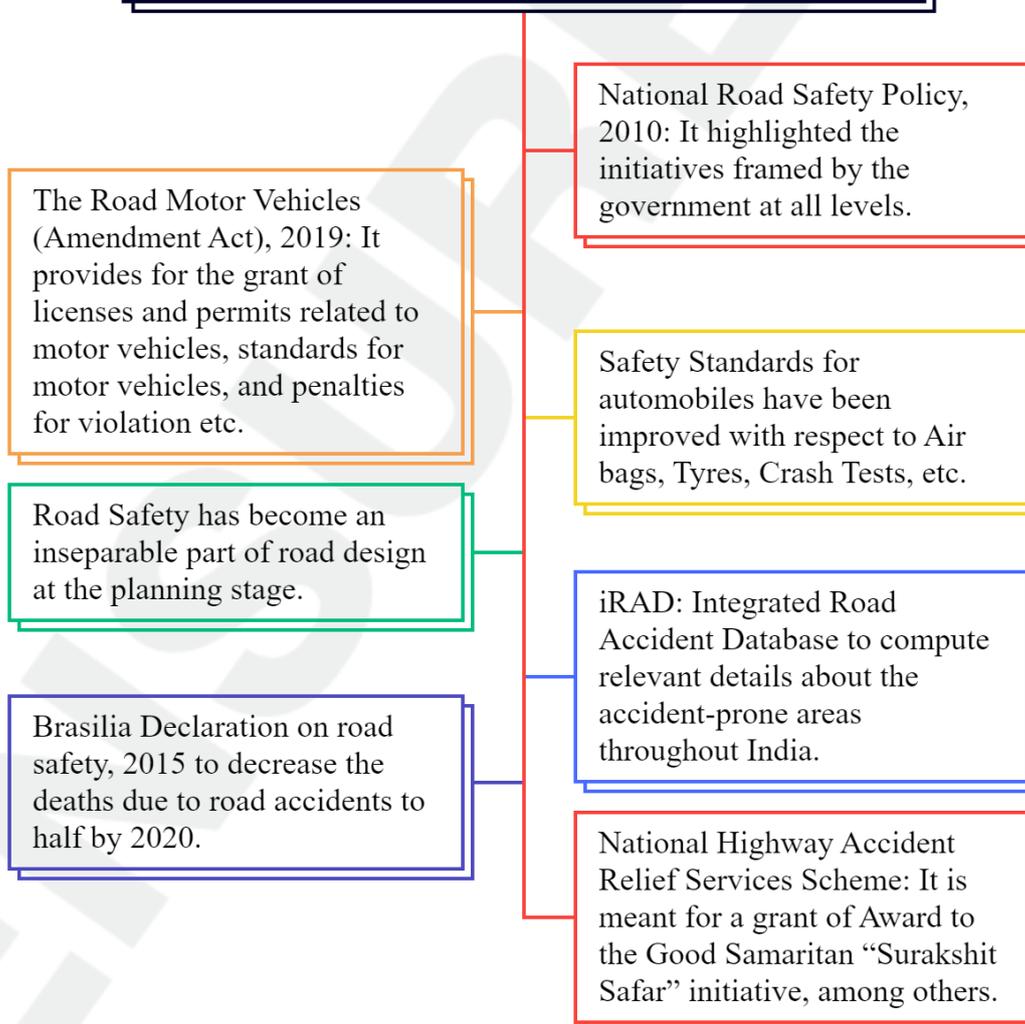> o There were in total 10 fatalities in past three years.

Reasons for Road Accidents

- **Over-speeding:** One of the leading causes of accidents is drivers exceeding the speed limits, especially on highways and expressways.
- **Distracted Driving:** The use of mobile phones, eating, adjusting the radio, or engaging in other activities while driving can lead to accidents.
- **Drunk Driving:** Driving under the influence of alcohol or drugs is a major problem, impairing judgment and reaction times.
- **Poor Infrastructure:** Many roads in India are poorly designed, and lack proper signage, lighting, and safety measures, leading to accidents.
- **Overloaded Vehicles:** Overloading of commercial vehicles and improper distribution of weight can result in loss of vehicle control.
- **Reckless Overtaking:** Risky overtaking manoeuvres on narrow roads or busy highways can cause collisions.
- **Lack of Road Safety Education:** Many drivers and pedestrians are not adequately educated about road safety rules and measures.
- **Defective Vehicles:** Poorly maintained vehicles, especially commercial ones, can lead to accidents.
- **Non-Adherence to Traffic Rules:** Disregarding for traffic signals, stop signs, and lane discipline contributes to accidents.

- **Poor Weather Conditions:** During monsoons or foggy conditions, visibility reduces, increasing the chances of accidents.
- **Pedestrian Safety:** Lack of pedestrian crossings, footpaths, and disregard for pedestrian safety often lead to accidents involving pedestrians.
- **Inadequate Enforcement:** Despite the presence of traffic laws, enforcement and penalties for violations may not be stringent enough.
- **Road Rage:** Aggressive driving behaviour and road rage incidents can escalate into accidents.
- **Lack of Emergency Services:** Delayed or inadequate medical assistance after an accident can worsen injuries and fatalities.

Initiatives Taken to Increase the Road Safety in India

The Road Motor Vehicles (Amendment Act), 2019: It provides for the grant of licenses and permits related to motor vehicles, standards for motor vehicles, and penalties for violation etc.

Road Safety has become an inseparable part of road design at the planning stage.

Brasilia Declaration on road safety, 2015 to decrease the deaths due to road accidents to half by 2020.

National Road Safety Policy, 2010: It highlighted the initiatives framed by the government at all levels.

Safety Standards for automobiles have been improved with respect to Air bags, Tyres, Crash Tests, etc.

iRAD: Integrated Road Accident Database to compute relevant details about the accident-prone areas throughout India.

National Highway Accident Relief Services Scheme: It is meant for a grant of Award to the Good Samaritan "Surakshit Safar" initiative, among others.

Way Forward

- **Stringent Law Enforcement:** Strengthen law enforcement to ensure traffic rules and regulations are strictly adhered to. This includes measures such as increasing traffic police presence, using technology for traffic surveillance, and imposing hefty fines for traffic violations.
- **Road Infrastructure Improvement:** Invest in better road infrastructure with well-maintained roads, proper signage, and markings. Implementing safety features like speed breakers, crash barriers, and pedestrian crossings can also significantly reduce accidents.
- **Road Safety Education:** Launch widespread road safety education campaigns to raise awareness among the public, drivers, pedestrians, and school children. Promote responsible driving and emphasize the importance of obeying traffic rules.
- **Driver Training and Licensing:** Enhance driver training and licensing procedures to ensure that only qualified drivers are allowed on the roads. Regular refresher courses for existing drivers can help reinforce safe driving practices.
- **Vehicle Safety Standards:** Implement and enforce stringent vehicle safety standards. Encourage the production and purchase of vehicles equipped with safety features like airbags, anti-lock braking systems (ABS), and electronic stability control (ESC).
- **Public Transport Development:** Improve and expand public transportation to reduce the number of private vehicles on the roads. Safe and efficient public transport options can encourage people to use them instead of driving their vehicles.
- **Data Collection and Analysis:** Establish a comprehensive database of road accidents, their causes, and locations. Regularly analyze this data to identify patterns and take targeted measures to address specific road safety challenges.
- **Community Involvement:** Involve local communities and NGOs in road safety initiatives. Collaborate with them to raise awareness, conduct safety programs, and identify road safety issues unique to specific regions.
- **Emergency Response Systems:** Strengthen emergency response systems to provide timely medical assistance to accident victims. A quick response can save lives and reduce the severity of injuries.
- **Strict Punishment for Hit-and-Run Cases:** Enforce strict punishment for hit-and-run cases to deter offenders from fleeing the accident scene.

1.14　SHORT NEWS

1.14.1 DEVELOPING COUNTRIES STATUS

- Recently, The US passed legislation establishing a US policy against granting China developing country status in future treaties and international organisations.
  - Earlier, similar legislation was passed by the House of Representatives.
- According to the US, China will no longer be considered a developing country due to its significant economy, military power, and extensive investments worldwide.
- Presently, World Trade Organization (WTO) has not defined 'developed' and 'developing' countries and therefore member countries are free to announce whether they are 'developed' or 'developing'.
  - There is no formal definition of developing countries per se defined by the UN but still uses the term for monitoring purposes.

- **Advantages of Developing country status**
  - Those countries that have developing countries status receive preferential treatment in terms of market access, loans, reduction in government support and technical assistance from international organisations.
  - They have the benefit of having a longer transition period before they are required to fully implement the WTO agreement.
  - Developing countries also benefit from unilateral preference schemes of some of the developed country members such as USA's Generalized System of Preferences (GSP).
  - They also receive favourable treatment concerning issues such as climate change responsibilities.

1.14.2 GLOBAL LIVEABILITY INDEX, 2023

- This index was developed by Economist Intelligence Unit's (EIU). It ranked **173 cities** based on their **liveability or living conditions**.
- Its ranking is based on **five factors- stability, healthcare, culture and environment, education**, and **infrastructure**.
- Most weightage is given to **culture, environment**, and **stability**.
- **Key findings:**
  - **Vienna, Austria**, has been named the best city to live in the world for the **second time** in a row.
  - From India, **New Delhi** and **Mumbai** are at **141st position**.

1.14.3 UNDA AND DAY-NULM PARTNERSHIP

- A collaborative partnership was commenced between UN Development Program (UNDP) and Deendayal Antyodaya Yojana-National Urban Livelihood Mission (DAY-NULM).
- It aimed at **empowering women to make well-informed career choices in the field of entrepreneurship**.
  - Women constitute only **15 % of the total entrepreneurs in India**.
  - It will offer support for **women looking to start and expand** their own enterprises, particularly in sectors like care economy, digital economy, electric mobility, waste management etc.
  - It is a **three-year project**, **extendable beyond 2025** and will cover eight cities in the initial phase. o It will aid in developing community business mentors called Biz-Sakhis in selected project locations.
- **DAY-NULM**:
  - It is being implemented since 2014-15.
  - It is a **Centrally Sponsored Scheme** being implemented by the Ministry of Housing and Urban Affairs.
  - **Objectives of DAY-NULM:**
    - ✓ It aims at universal coverage of the urban poor for skill development and credit facilities.
    - ✓ It strives for skill training of the urban poor for **market-based jobs** and **self-employment,** facilitating easy access to credit.
    - ✓ It aims at extending its coverage for all the 4041 statutory cities and towns thereby covering most of India's urban population.

1.14.4 FAIR AND REMUNERATIVE PRICE (FRP)

- The FRP of sugarcane for the 2023-24 sugar season has been approved by Cabinet Committee on Economic Affairs.
- **FRP**: This is the **minimum price** at which farmers sell sugarcane to sugar mills from farmers. It is **determined** under **Sugarcane (Control) Order, 1966**.
- There is a dual pricing mechanism for sugarcane
  - On the recommendations of the Commission for Agricultural Costs and Prices (CACP), FRP is announced by the central government.
  - States can also announce State Advised Prices, usually higher than FRP

1.14.5 FRAMEWORK FOR COMPROMISE SETTLEMENTS AND TECHNICAL WRITE-OFFS

- Recently the Central Bank released **Framework for Compromise Settlements and Technical Write-offs** with an aim to provide **further impetus** to the **resolution of stressed assets** in addition to rationalising instructions across all **Regulated Entities (REs)**
- REs incorporates all **Commercial Banks**, **Primary (Urban) Co-operative Banks**, State and Central Cooperative Banks, NBFCs (including Housing Finance Companies) etc.
- In 2019, RBI also issued the **Prudential Framework** for Resolution of Stressed Assets regarding compromise settlements.

Key features of the framework
- It shall put in place **Board-approved policies** for undertaking compromise settlements and technical write-offs.
- Policies comprise **specific conditions** like a framework to assess staff accountability, methodology for arriving at the realisable value of security, a delegation of powers for approval/sanction etc and a reporting mechanism to the next higher authority, at least on a quarterly basis.
- Cooling period (for borrowers subject to compromise settlements) with respect to exposures other than farm credit exposures shall be subject to a **floor of 12 months**. REs are free to stipulate higher cooling periods.
- REs can **undertake compromise settlements** or technical write-offs regarding accounts categorised as wilful defaulters or fraud without prejudice to criminal proceedings against such debtors.

Key Terms

Compromise Settlements: It is a negotiated arrangement with the borrower to fully settle claims of RE against the borrower in cash.

Technical Write-off: These are the cases where Non-Performing Assets remain outstanding at the borrower's loan account level but are written off by RE only for accounting purposes.

Willful Defaulter: A borrower who refuses to pay loans despite being able to pay up.

1.14.6 FINANCIAL STABILITY REPORT

- It is a **bi-annual report**, issued by the Central Bank which reflects risks to the financial stability and resilience of the Indian financial system (Global FSR is released by IMF).
- **Key Highlights:**
  - o Indian banking system is **well-capitalised** and **capable of absorbing macroeconomic shocks** over a one-year horizon even in the absence of any further capital infusion.
  - o **Gross Non-Performing Assets (GNPA) ratio** of Scheduled commercial banks (SCBs) continued its **downtrend and fell to a 10-year low of 3.9%** in March 2023.
  - o **Net non-performing assets (NNPA) ratio** reduced to **1.0%**.
  - o **Capital to Risk-Weighted Assets Ratio (CRAR) of SCBs** rose to historical highs of **17.1% in March 2023**.
  - o Creating a framework for global regulation, including the possibility of prohibition, of unbacked crypto assets, stablecoins etc. would be a priority.

    ✓ Stablecoins are cryptocurrencies whose **value is pegged to that of another currency**, commodity, or financial instrument.

> **Capital-to-Risk Weighted Ratio:** It compares capital to risk-weighted assets.
>
> **Gross Non-Performing Assets:** Total value of all NPAs that a Bank or a business holds.
>
> **Net Non-Performing Assets:** It is the sum that is realized after the amount of the provision has been deducted from the overall NPAs.

- **Insolvency and Bankruptcy Code (IBC)** has rescued **72% of the distressed assets** since it came into existence in 2016.
- Average time for concluding corporate insolvency resolution process (CIRPs) that yielded resolution plans was **512 days** (330 days provided in IBC)

1.14.7 GLOBAL ECONOMIC PROSPECTS REPORT

- World Bank releases this report twice a year, in January and June.
- **Findings**
  - o The global economy is projected to "slow substantially" this year, with a "pronounced deceleration" in advanced economies.
  - o For FY24, GDP growth in India is seen at **6.3%** compared with a previous estimate of 6.6% in January.
  - o Private Investment in India was likely boosted by increasing corporate profits while unemployment declined to 6.8% in the first quarter of 2023.

1.14.8 FINANCIAL SERVICES INSTITUTION BUREAU

- New chiefs for the **General Insurance Corporation of India (GIC Re)** and **National Insurance Company (NIC)** selected by the FSIB.
- **FSIB**: It was established under the Department of Financial Services (DFS), Ministry of Finance. It replaced Banks Board Bureau (BBB).
- **Composition:**
  - o It consists of a chairperson who is nominated by Central Government.
  - o **Ex officio members:** It consists of Secretary in charge of DFS, the Department of Public Enterprises, the Chairperson of IRDAI, Deputy Governor of RBI.

- o In addition, it also consists of several part-time members with subject matter knowledge.
- **Functions**
    - o It is mandated to recommend whole-time directors and non-executive chairpersons on Boards of financial institutions.
    - o It also advises on other matters regarding to personnel management institutions.

1.14.9 GREEDFLATION

- In a fundamental sense, it is the inflation and **hike in prices not driven by economic flow**, **but by corporate greed**.
- It can be understood by the condition that when the corporate **desire** for **excessive profit** (greed) which in turn causes inflation.
- Companies artificially hike their prices not just to cover the input cost but to increase their profit margins

1.14.10 ANTARDRISHTI

- A **Financial Inclusion Dashboard**, named, **ANTARDRIHSTI RBI** has been launched by the governor with an aim to provide the **required insight to assess and monitor the progress of financial inclusion** by capturing relevant parameters.
- It will also enable to know the extent of financial exclusion at granular levels across the country so that such areas can be addressed.
- The dashboard is presently intended for internal use in the RBI

1.14.11 GIFT TAX

Recently, CBDT exempted buyers from gift tax when they purchase equity shares in public-sector units (PSUs) through strategic disinvestment.
- **Gift Tax:** A "gift" can be in the form of money and movable/immovable property that an individual receives from another individual or organization without making a payment.
- under Section 56(2)(x) of the Income Tax Act, before the amendment, the difference in book value and fair market value was considered deemed income for the buyer.
- For the buyer, the difference is treated as deemed income, which gets taxed at the rate applicable to the individual.
- The **relaxation will stay** as long as the **strategic investor retains at least 51 per cent** in the PSU after the takeover.

1.14.12   GLOBAL COMPETITIVE INDEX (GCI)

Recently, **International Institute for Management Development** which is situated in Switzerland publishes the Global Competitiveness Index.
- **Denmark, Ireland**, and **Switzerland** have been named the top three among 64 economies measured for their global competitiveness.
- India slipped **3 spots to finish 40th** but is still in a better position than it was in 2019-2021.
- There are **three main measures** that helped India to achieve this score **exchange rate stability**, **compensation levels**, and **improvements in pollution control**.

- The Global Competitiveness Report (GCR) is a **yearly report** published by the **World Economic Forum.**

1.14.13   NATIONAL AGRICULTURAL MARKET (eNAM)

- In FY24. eNAM is set to cross **1 Trillion Rupees** trade.
- **eNAM:**
  - e-NAM is a **pan-India electronic trading portal** that networks with the existing Agricultural Produce Market Committee Mandis. It was **launched in 2016**.
  - It develops a **unified national market for agricultural commodities** by
    - ✓ streamlining the procedures across the integrated markets.
    - ✓ eliminating information asymmetry between buyers and sellers.
    - ✓ promoting real-time price discovery.
- This scheme is **entirely funded** by the Central Government and is implemented **under the Ministry of Agriculture and Farmers' Welfare** by **Small Farmers Agribusiness Consortium**.
- **Other key features**:
  - Promamte trade from warehouses based on e-NWR (electronic Negotiable Warehouse Receipt).
  - NWR system permits the transfer of ownership of a commodity stored in a warehouse without having to deliver it physically.
  - **Platform of Platforms (POP) to facilitate farmers to sell the produce** outside their state borders.
  - 41 service providers from different platforms facilitating various value chain services like trading, quality checks, warehousing, fintech, etc. are covered
  - AI based equipments have been integrated with e-NAM platform
- **Key Outcomes**
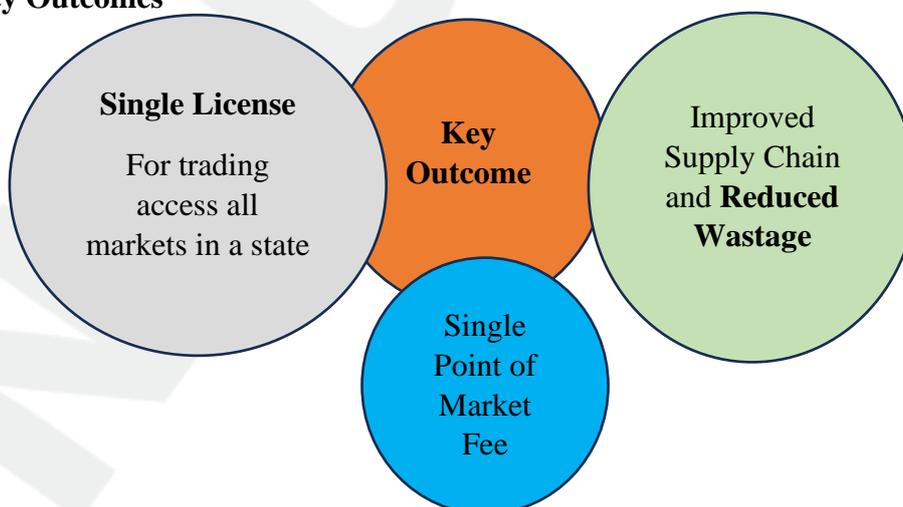
1.14.14   PRADHAN MANTRI KISAN SAMMAN NIDHI (PM-KISAN) SCHEME

- **PM-Kisan Mobile App with Face Authentication Feature** has been launched by the Ministry of Agriculture & Farmers Welfare (MoA&FW).
- It is the **first scheme of the government** to do **e-KYC through facial authentication** mobile app.

- It will make farmers capable to **complete their e-KYC process** by scanning their faces on mobile phones instead of using OTPs or fingerprints.
- It solves the problems regarding Aadhaar verification and updating bank account details on the PM Kisan Portal through the effective use of digital public goods.
- **Face Authentication Process** is used to **uniquely identify a person** on the basis of facial features like the distance between eyes, the shape of cheekbones etc.
  - o It is part of a larger biometric security tool that includes iris scans, fingerprints etc.
  - o **Advantages**
    - ✓ It is based on facial uniqueness that enhances security, faster process of identification etc.
    - ✓ Additionally, the Digi Yatra app, based on **Facial Recognition Technology**, user base that crosses the one million marks.
    - ✓ It was launched by the Ministry of Civil Aviation, Digi Yatra is conceived to achieve contactless, seamless processing of passengers at airports. o It facilitates paperless travel and avoids identity checks at multiple points in an airport.

- **PM-KISAN Scheme**
  - o It was launched in 2019 as a Central Sector Scheme with **100% funding from the Government of India.**
  - o It is known as the **world's largest Direct Benefit Transfer (DBT)** Scheme
  - o It offers income support of Rs.6000 per year (Rs.2000 every four months) to all land-holding farmer families across the country.

1.14.15   GOVT WITHDRAWS DRAFT LIVESTOCK BILL

- Due to concerns raised by animal activists, the government has withdrawn the '**Livestock Products Bill, 2023**' that resulted in the existing **Live-stock Importation Act, 1898**, and the **Live-stock Importation (Amendment) Act of 2001** will continue to regulate livestock.
- **Livestock Importation Act 1898**
  - o The Central Government has the right to regulate, restrict or prohibit the import of any livestock which may be liable to be infected.
  - o The Customs officers shall have the power to implement the government's order.
  - o The State Government may also make rules for the imported live-stock within its jurisdiction.
  - o In 2001, the last amendment was done that changed the definition of livestock products and also included the provisions of the Customs Act 1962.
- **Need to Replace the 1898 Act**
  - o It controls the **importation** of livestock and **does not cover exports**
  - o It lacks power to **make arrangements for the promotion** and development of exports of **livestock products.**
  - o In order to curb **zoonotic disease (**a disease that can be transmitted naturally from vertebrate animals to human or from humans to vertebrate animals) arising out of import and export of livestock.

1.14.16   ELECTRONICS REPAIR SERVICES OUTSOURCING (ERSO)

- Recently, a pilot project on ERSO was launched by the Ministry of Electronics and Information Technology (MeitY).
- MeitY in combination with other ministries/departments, **converged with the industry** for launching the ERSO Pilot initiative to make India the Repair Capital of the World.
- the ERSO industry is likely to **fetch India around $20 billion in revenue** and also generate millions of jobs over the next 5 years
- By 2026, the **Global electronic equipment repair service market** is forecast to reach USD 188 billion.
- ERSO comprises **outsourcing of defective/damaged electronic items** to Indian repair service organizations for repair, refurbishment, and calibration to achieve optimal functionality.
- **India's advantage in the ERSO sector:**
    o Availability of a skilled & affordable workforce offers a huge repair advantage **(almost 57% more competitive than China)** over other countries.
    o Factors like availability of electronic equipment insurance, right-to-repair concept, Domestic Digital push by Government in addition to other factors comprising innovative offerings to target customers, rapid urbanization and technological advancements, growing demand for refurbished electronic equipment etc.
- **Significance for India**
    o **Contribution** to **Mission Life** and **Circular Economy**
    o **Incremental tax revenue** for the government
    o **Skill Enhancement** of Workforce
    o **Growth of** MSME Sector

1.14.17   STRATEGIC RESERVES OF CRUDE OIL

- Rajasthan is being considered a **potential site for strategic reserves of crude oil** in salt caves
- **Engineers India (EIL)** which is a Government-owned consultancy firm is considering the prospects and feasibility of developing **salt cavern-based strategic oil reserves in Rajasthan** for acquiring **energy security**.
- Rajasthan is known for having the bulk of requisite salt formations in India and therefore is being seen as the most conducive for developing salt cavern-based strategic storage facilities.
- Indian Strategic Petroleum Reserve Limited, which is a special purpose vehicle under the Ministry of Petroleum and Natural Gas (ISPRL) is charged with the construction of strategic oil reserves facilities.
- **Salt cavern-based reserves vs. Rock cavern-based reserves**
    o Contrary to underground rock caverns, which are developed through excavation, salt caverns are developed by the process of solution mining that involves pumping water into geological formations with large salt deposits to dissolve the salt.
    o It is a simple, fast, and less cost-intensive process than developing excavated rock caverns.
    o Salt cavern-based storage can be created and operated almost entirely from the surface, unlike rock caverns.

- **Strategic Petroleum Reserves (SPR)**
  - SPR of India have a **cumulative capacity of 5.33 Million Metric Tonnes (MMT)** of crude oil and can meet around 9.5 days of the country's oil demand.
  - International Energy Agency (IEA) of which India is an associate member recommends that all countries should hold an emergency oil stockpile sufficient to provide 90 days of import protection.
  - Presently, **India has three SPRs** (made up of excavated rock caverns) **at Mangalore 1.5 MMT, Padur 2.5 MMT (both in Karnataka), and Visakhapatnam 1.33 MMT (Andhra Pradesh)**.
  - Another **6.5 MMT of strategic crude reserves** is planned at **Chandikhol** 4 MMT **(Odisha)** and **Padur 2.5 MMT**.

1.14.18   EXPLORATION OF COAL AND LIGNITE SCHEME

- Recently, the **continuation of the Central Sector Scheme of "Exploration of Coal and Lignite Scheme"** was approved by the Cabinet. It will run from **2021-22 to 2025-26**.
- **Exploration of Coal and Lignite Scheme**
  - Exploration for Coal and Lignite is conducted in two broad stages: **Promotional (Regional) Exploration** and **Detailed Exploration in Non-Coal India Limited blocks**.
  - **Importance:** It proves and gives an **estimated coal resources available** in the country that supports in preparing **detailed project report** to start coal mining.
  - The Geological reports that are prepared on the basis of these exploration is used for auctioning new coal blocks

1.14.19   STEEL INDUSTRY

- Currently, India ranks as the **2nd Largest Producer of Crude Steel with the production of crude steel at 133.596 MT** in the World. In 2018, it crossed Japan. **China** remains the **global leader** in **crude steel production**.
- **Steel**: It is an **alloy of iron and carbon** containing **less than 2% carbon**, **1% manganese**, small amounts of **silicon, phosphorus, sulphur and oxygen**.
  - Iron is made by **removing oxygen** and **other impurities** from **iron ore**. Steel is the **world's most important engineering** and **construction material**.
  - **Initiatives for the steel industry**
    - ✓ **Steel Scrap Recycling Policy** in order to promote the scientific processing and recycling of ferrous scrap
    - ✓ **National Steel Policy 2017** has the targets of **achieving a total crude steel capacity of 300 MTPA** and **total crude steel demand/production** of **255 MTPA by 2030-31**
    - ✓ Policy for providing **preference to Domestically Manufactured Iron and Steel Products** (DMI & SP Policy)
    - ✓ **Production Linked Incentive (PLI)** Scheme for domestic production of steel has been approved in **2021**.
- **Iron Ore**
  - Iron ores consist mainly of **hematite, magnetite, limonite, and siderite** ($FeCO_3$).
  - **Main Active Mines**

- ✓ Nuagaon, Gandhamardhan, Joda, Balda, Bailadila, Narayanposhi, Daitari, and Barsua Mine.
- ✓ In 2021, India exported **$4.3B in Iron Ore** that makes it the **7th largest exporter of Iron Ore** and, **imported $177M in Iron Ore**, becoming the **41st largest importer of Iron Ore**.
- ✓ **Low-grade ores** comprised **92%** of India's total iron ore exports.

1.14.20　PETROLEUM COKE (PET COKE)

- Recently the **Directorate General of Foreign Trade (DGFT)** allowed **the import of pet coke as raw material** for **lithium-ion batteries.**
- **Needle pet coke (NPC)'s** import is permitted for making graphite anode material for lithium-ion batteries, not for any other purposes**.** It has a **sulphur content** less than **0.8%**.
- India is the **world's largest consumer** of petcoke therefore India imports over half its annual petcoke consumption, mainly from the USA.
- In 2018, the Government banned the import of pet coke for use as fuel, but allowed for cement, lime kiln, calcium carbide and gasification industries.
- **Petroleum coke (pet coke):**
  - o It is a **carbon-rich solid material** derived from **final cracking process**, a thermos-based chemical engineering process that splits long chain hydrocarbons of petroleum into shorter chains.
  - o **Grades of pet coke**: Green Coke (high moisture and volatile matter content), Calcined coke (a higher carbon content than green coke).
  - o **Modes of Pet Coke**
    - ✓ Honeycomb Coke, Sponge Coke, NPC, Shot Coke
  - o **Applications:** Feedstock/Fuel use (Cement, gasification, boilers etc), Carbon source (Electrodes, Synthetic Graphite, silicon carbide, TiO2 pigments, Carbon Raiser etc.)
  - o **Issues due to pet coke use**:
    - ✓ It has **over 80% Carbon** and **emits 5 to 10% more CO2 than coal** on a per unit of energy basis.
    - ✓ Apart from sulphur, it also **releases** other toxic gases including **nitrous oxide, mercury, arsenic, chromium, nickel,** and **hydrogen chloride** after burning.
    - ✓ It contains **heavy metal content**.
  - o **Benefits of Petcoke over Coal**
    - ✓ It has a higher **Calorific Value**
    - ✓ It is hydrophobic while coal is hydrophilic therefore it has an edge **during the rainy season.**
    - ✓ It has low ash content.

1.14.21　NATIONAL ENERGY DATA: SURVEY AND ANALYSIS 2021-22

- It is the maiden report of the **Energy Data Management Unit** that comes under the **Bureau of Energy Efficiency**.
- **Key Points**:
  - o As of 2022, the **total estimated reserves of coal** that meet almost **half of India's energy requirement** were **361411.46 MT (Millon Tonnes)**.

- o **India's crude oil production** has decreased from **36.01 MT 2016-17** to **29.69 MT in 2021-2022**.
- o From **2016-17 to 2021-22, India's domestic production of LPG** has grown at a **CAGR of 2%**.
- o In 2016-17, India exported **26% of its domestic production of diesel**, while **this share** increased to **30% in 2021-22**.

2. ENVIRONMENT

2.1 GLACIERS IN HINDU KUSH HIMALAYA (HKH)

Latest Context

A report on the Hindu Kush Himalaya (HKH)'s water, ice, society, and ecosystems (WISE) was released by the International Centre for Integrated Mountain Development **(ICIMOD).**

More about News
- **ICIMOD** is an intergovernmental knowledge and development organization (established in 1983) that focuses on climate and environmental risks, green economies, and sustainable action.
- **Members of ICIMOD** are **Pakistan, Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, and Nepal.**
- **Impacts of climate change on HKH that were highlighted by the WISE report:**
  1. **Glacier:** In comparison to the preceding decade, the loss of Water Glaciers accelerated by 65% in the 2010s. By 2100, glaciers will have lost 30% to 50% of their volume compared to 2015 under global warming between 1.5°C and 2°C.
  2. **Water Security:** In the majority of the HKH river basins, 'peak water' will be achieved by the middle of the century due to rapid glacier melt, and by the end of the century, it is anticipated that there will be less water available overall. **Peak water** refers to the period when there will be the greatest ever quantity of fresh snow water as a result of glacier melt.
  3. **Increase in Hazards:** Over the next several decades, it is expected that hazards like floods, landslides, big avalanches, glacial lake outburst floods (GLOFs), etc., would become more frequent. By the end of the twenty-first century, the probability of GLOF across the HKH is predicted to have tripled.
  4. **Water Scarcity:** Changes in precipitation patterns, coupled with glacier melt, are leading to water scarcity in many parts of the HKH region. This impacts both human populations and ecosystems that depend on these water resources.
  5. **Biodiversity Loss:** The HKH region is a biodiversity hotspot, but various human activities, such as deforestation, habitat destruction, and overexploitation of resources, are leading to the loss of plant and animal species. This loss of biodiversity has ecological and economic consequences.
  6. **Land Degradation:** Unsustainable land use practices, including deforestation, overgrazing, and improper agricultural techniques, contribute to land degradation in the HKH region. Soil erosion and landslides are common outcomes, further exacerbating environmental issues.
  7. **Loss of Livelihoods:** The impacts of climate change and environmental degradation are affecting the traditional livelihoods of communities in the HKH region, such as farming, herding, and forestry. Many people are forced to migrate in search of alternative livelihood opportunities.
  8. **Pollution:** Rapid urbanization and increased human activities in the region have led to pollution of air, water, and soil, negatively affecting both human health and ecosystems.
  9. **Political and Social Challenges:** The HKH region spans multiple countries, each with its socio-political challenges. Transboundary issues related to water

management, resource sharing, and climate change adaptation require coordinated efforts and international cooperation.
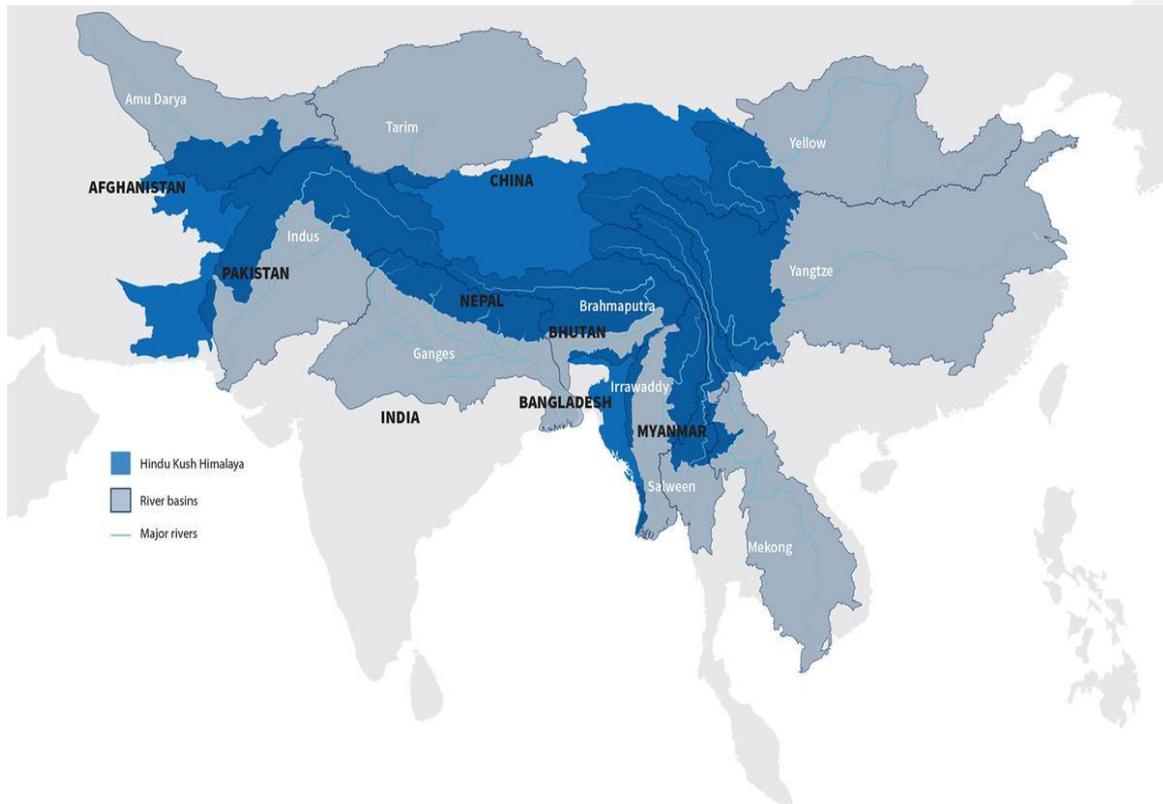
Facts about HKH

- **Afghanistan, Bangladesh, Bhutan, China, India, Kyrgyzstan, Mongolia, Myanmar, Nepal, Pakistan, Tajikistan, and Uzbekistan are all included in the Hindu-Kush-Himalayan (HKH) area.**
- After the North and South Poles, it is regarded as the **Third Pole,** and its effects on the climate are profound.
- **In comparison to the Arctic and Antarctica, it has the largest volume of ice and snow**.
- This region's ice and snow serve as a significant water supply for 12 rivers that pass through 16 Asian nations.
- The area is sometimes referred to as the **'Water Tower of Asia'.**

Importance of HKH

1. **Biodiversity hotspot:** The HKH region is one of the most biodiverse areas in the world, harbouring a wide range of flora and fauna. It serves as a habitat for numerous endangered species, some of which are endemic to the area.
2. **Water source:** The HKH is often referred to as the "water tower of Asia" because it is the source of many major rivers, including the Ganges, Indus, Brahmaputra, Yangtze, and Yellow Rivers. These rivers provide water for millions of people in the downstream regions.
3. **Glaciers and climate regulation:** The region is home to numerous glaciers that play a crucial role in regulating the climate. The glaciers act as natural reservoirs, releasing water during dry seasons and helping to maintain river flow and sustain ecosystems.

4. **Livelihoods and agriculture:** The HKH region support a significant portion of the population through agriculture and other livelihood activities. People depend on the region's natural resources for food, water, and various economic activities.

5. **Cultural diversity and heritage:** The HKH region are rich in cultural diversity, with various ethnic groups, languages, and traditions coexisting in the area. This cultural heritage is an essential part of the region's identity and contributes to its significance.

6. **Climate change impact:** The HKH region is particularly vulnerable to the impacts of climate change. Rising temperatures, melting glaciers, and changing weather patterns pose significant challenges for the people and ecosystems in the region.

7. **Ecosystem services:** The HKH region provides vital ecosystem services, including carbon sequestration, pollination, and soil fertility maintenance, which have far-reaching implications for both regional and global environmental health.

8. **Geological significance:** The region is tectonically active, being part of the collision zone between the Indian and Eurasian plates. The ongoing tectonic processes have shaped the landscape and continue to influence seismic activity in the area.

Challenges in combating the worsening situation in HKH

- **Poor adaptation capabilities:** Due to inadequate financial and technical assistance, there are significant gaps between communities' requirements for adaptation and their ability to acquire the essential adaptation help.

- **Complex and unpredictable Hazards:** It is challenging to put early warning and adaptation mechanisms in place since several slow-onset hazards (like erosion) and fast-onset hazards (like GLOFs) sometimes occur in the same watersheds at the same time.

- **Infrastructure development and Population growth:** Greater risks have been presented to larger communities.

- **Low protection:** The HKH contains 39% of the world's biodiversity hotspots and around 67% of the ecoregions.

- **Limited Regional Cooperation:** The fact that HKH is dispersed across several nations makes it difficult to collect data and adopt consistent rules.

- **Neglect at International Forums:** In the worldwide debate on climate change, such as the Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC), HKH's concerns are not accorded the weight they deserve.

Way Forward

- Technical and financial support, improved transboundary data and information exchange, and effective protection of mountain communities and biodiversity hotspots are all in need of regional and international collaboration.

- **Enhanced monitoring Network:** High-quality products may be produced by combining methods like as in-situ observations, remote sensing, satellite data, and modelling.

- Developing early warning and adaptation techniques while taking into consideration the increasing risk of multiple hazards and cascade events brought on by climate change.

- **Using an integrated approach to managing water resources:** To prepare for future changes, governments should have a solid understanding of how different water sources affect river flows.

Measure Initiatives to protect Glacial Ecosystem

India's Initiatives

- The Department of Science and Technology is responsible for implementing the **National Mission for Sustaining the Himalayan Ecosystem (NMSHE).**
- It is a component of the 2008-launched National Action Plan on Climate Change **(NAPCC).**
- The Ministry of Earth Sciences (MoES) founded the National Centre for Polar and Ocean Research **(NCPOR).**
- In 2016, the research station **'Himansh'** was built in the **Chandra basin (Himachal Pradesh).**
- The **National Institute of Hydrology (NIH)** is working on a number of studies to evaluate runoff from glacier melting at catchment and basin sizes.

Global Initiatives

- Efforts from **ICIMOD**, including the Mountain Ministerial Summit and the Hindu Kush Himalayan Monitoring and Assessment Programme **(HIMAP).**
- United Nations Development Programme (UNDP) and ICIMOD's regional cooperation framework.
- **World Glacier Monitoring Services of UNESCO**.

2.2 ENERGY TRANSITION

Latest Context

The **"Fostering Effective Energy Transition 2023"** report was issued by the World Economic Forum (WEF) in collaboration with Accenture. This report included the publication of the Energy Transition Index (ETI).

Facts about Energy Transition Index (ETI), 2023

- **Energy transition:** It refers to the global energy sector's shift from fossil-based systems of energy production and consumption (including oil, natural gas, and coal) to renewable energy (RE) sources like wind and solar.
- **Just Transition:** It is defined as a low-carbon transition that is fair, inclusive, creates decent work opportunities and leaves no one behind. It adopts a people-centred approach and focuses on addressing current and future challenges of the energy system.
- It is prepared on the **three parameters- equity, security, and sustainability.**
- **Key Findings:**
  - The top three positions are held by Sweden, Norway, and Denmark.
  - India is in 67th place overall out of 120 nations.
  - The only two nations improving the performance of their energy systems are Singapore and India.
  - Over the last ten years, ET has grown steadily each year; but, in the last three years, the growth has levelled off due to growing obstacles to the equity and inclusivity of the transition.
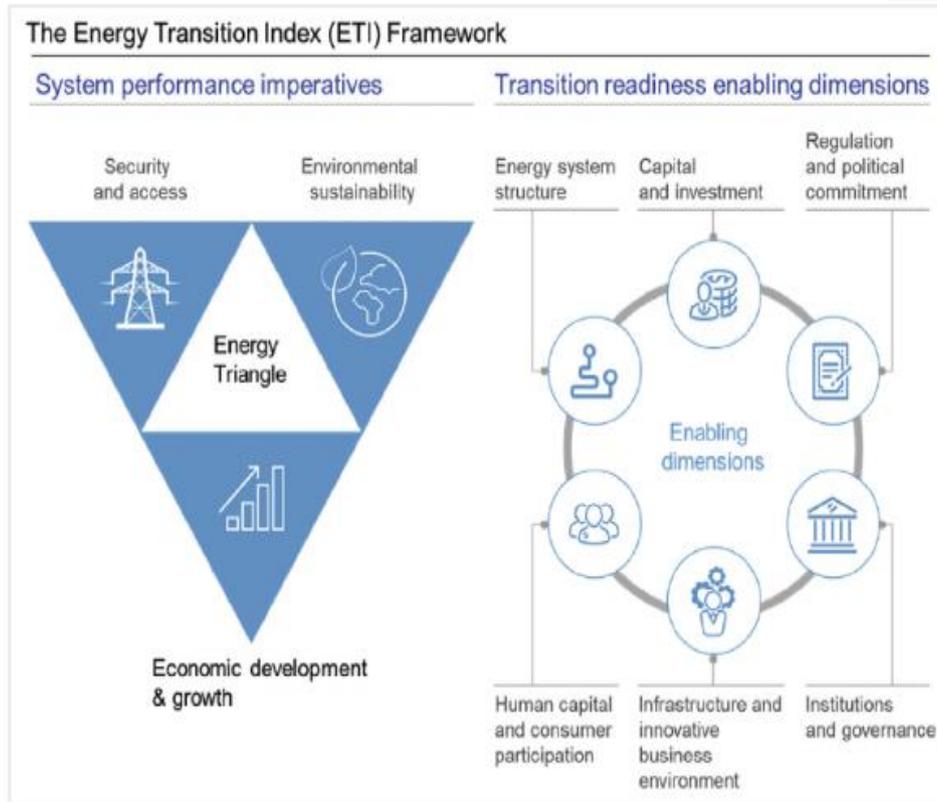
- **Energy Transition Index (ETI) Framework:**

Fig. 1. Energy transition framework (source: World economic forum).

Requirement for Energy Transition in India

- **Lowering emissions and combatting Global warming:** With an estimated 34% share of the country's total GHG emissions in 2019, the electrical sector is a significant source of GHG emissions in India.
- **Environmental Impact:** Significantly detrimental environmental effects of fossil fuel extraction and burning include habitat destruction, air and water pollution, and others.
- **Fulfil International Commitments:** To accomplish its Nationally Determined Contributions (NDCs) and the Panchamrita Pledge, such as obtaining 50% of its energy from non-fossil fuel sources by 2030 and reaching net-zero emissions by 2070, India must quicken the energy transition.
- **Decreased Energy Dependency/Energy Security:** India must reduce its reliance on imported energy if it wants to resolve problems with the volatility of the energy supply chain. For instance, recent economic and geopolitical events like the Ukraine conflict have raised gasoline prices and made energy less accessible.
- **Energy accessibility and affordability:** Solar photovoltaic and onshore wind power in particular have developed to a mature, cost-competitive state and can improve accessibility at various topographies.
- **Introduce green jobs:** According to the Global Energy Transition Outlook published by the International Renewable Energy Agency, 43 million people might be engaged in the RE industry by 2050.

Challenges in Energy Transition

- **Dependence on Conventional Sources:** In India, the installed capacity from fossil fuels accounts for more than 50% of the total installed capacity as of June 2023.

- **Financial constraints:** According to some estimates, between 2015 and 2030, cumulative investments of up to 6–8 trillion USD would be needed to change India's present energy systems. The need for increased low-cost finance availability in G20 nations and beyond for the energy transition is also highlighted in the newly released Low-cost Finance for the Energy Transition Report (by IRENA in close collaboration with the Ministry of New and Renewable Energy).

- **Reduce Private participation:** Due to poor return and significant risk, ambiguous or contradictory laws and regulations, etc., private participation is restricted.

- **Giving Just Transition:** Unfair energy transition can make industries and employees involved in the supply networks for fossil fuels more economically vulnerable.

- **Ambitions and implementation gaps between the Centre and the States:** National objectives may not reflect state goals (a resource-rich area favouring the use of coal, for example). Additionally, the energy transition may make existing problems in the power sector, including large discom losses, worse and harm state economies.

- **Technology availability:** India cannot currently produce large-scale low-carbon technologies (LCTs), particularly in the offshore wind, hydrogen electrolyzer, and energy storage sectors, among others.

- Inadequate grid connection, transmission networks, and energy storage systems, among other things.

India's Initiatives Towards Energy Transition

Policy Framework
1. National Offshore Wind Energy Policy 2015
2. National Wind- Solar Hybrid Policy 2018
3. Green Hydrogen/Green Ammonia Policy 2022
4. Energy Conservation and Sustaianble Building Code

Schemes/Initiatives
1. National Solar Mission
2. National Green Hydogen Mission
3. Renewable Purchase Obligations
4. Green Term- Ahead Market
5. Carbon Credit Trading Scheme 2023

International Cooperation
1. International Solar Alliance
2. One Sun One World One Grid
3. Mission Integrated Biorefineries
4. World Bank's First Low Carbon Energy Programmatic Development Policy Operation

Way Forward
- Closing inefficient thermal power facilities powered by fossil fuels and gradually phasing out fossil fuel-based electricity.

- Implementing mixed finance arrangements, which entail the strategic provision of capital by the public sector to reduce certain risks that private sector capital is unable to handle.

- Coordinated policies and initiatives are incorporated into effective innovation frameworks to promote innovations in four areas: enabling technology, business models, market design, and system operation.

- Encouraging the research and development of cutting-edge technologies in domains including coal gasification, offshore wind, carbon capture, use, and storage, high-efficiency fuel cells, advanced chemistry cells, etc.
- Cooperation on a global scale using tools **like Just Energy Transition Partnerships (JETPs). JETPs** are finance tools for collaboration that aid nations largely reliant on coal in making a fair energy transition and addressing the social effects of that shift.

WORLD ECONOMIC FORUM

WEF is a **Swiss non-profit foundation** established in 1971, based in Geneva, Switzerland.

Recognized by the Swiss authorities as the international institution for **public-private cooperation**.

Objectives: Committed to improving the state of the world by engaging business, political, academic, and other leaders of society to shape global, regional, and industry agendas.

Key areas of Focus: Fourth Industrial Revolution, Solving the problems of Global commons, and addressing global security issues.

Membership: More than 390 firms from over 360 countries (Membership is by invitation only).

Founder and Executive Chairman: Klaus Schwab.

Major Reports published by WEF are:

1. Global Competitiveness Report.
2. Global IT Report
3. WEF along with INSEAD, and Cornell University publishes this report.
4. Global Gender Gap Report.
5. Global Risk Report.
6. Global Travel and Tourism Report.

'TRACKING SDG 7: THE ENERGY PROGRESS' REPORT

It was released through the **collaboration between the International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division, World Bank, and the WHO.**

SDG 7 provides for achieving affordable, reliable, sustainable, and modern energy for all.

Key Findings:

1. The current pace is not adequate to achieve any of the 2030 targets.
2. Globally, access to electricity between 2010 and 2021, grew from 84% of the world's population to 91%.
3. To enable an energy system aligned with the 1.5°C target through the century, the share of renewables in global energy mix must reach 33–38% by 2030, from the current 19.1% in 2020.
4. India alone accounts for the largest share of the access deficit (defined as the population lacking access to electricity), with 505 million people lacking access, followed by China.

2.3 COAL-BASED THERMAL POWER PLANT COMPLIANCE WITH EMISSION NORMS

Latest Context

The **Centre for Science and Environment (CSE),** an environmental NGO, recently evaluated the coal-fired thermal power plants' (TPP) compliance with SOx emission norms.

More information regarding news

- The **Central Electricity Authority (CEA),** a division of the Ministry of Power, provided the data on which the report is based.
- Based on the installation of **Flue Gas Desulphurization (FGD) at TPPs**, CSE has conducted an assessment.
- **Major finding:**
  1. The amount of coal generating capacity that has so far complied with emission norms is only 5%.
  2. 17% of the total coal power capacity was still just partially compliant.

Emission Norms for Thermal Power Plant (TPP)

- **Under the Environment (Protection) Act of 1986**, the Ministry of Environment, Forest, and Climate Change first set environmental emission limits in 2015 **to reduce SO2, NOx, and mercury emissions from coal-based TPPs.**
- The bulk of India's coal-based power facilities now have **deadline extensions to 2021.**
- **Three Categorization with three different deadlines:**

Category	Location/area	Changed Deadlines
Category A	Within a **10-km radius of Delhi-NCR and cities population more than 10 Lakh**	December 31, 2022 to December 31, 2024.
Category B	10-km radius of critically-polluted areas or non-attainment cities (those cities failed to meet the National Ambient Air Quality Standards)	December 31, 2023 to December 31, 2025.
Category C	For all other power plants	December 31, 2024 to December 31, 2026.

- The **defined SOx requirements** will not be needed for power plant units that have been declared to retire **before December 31, 2027**.
- **Regarding water usage: Cooling Towers (CT)** must be installed in all plants utilising Once Through Cooling (**OTC**). The temperature at which condenser cooling water can be discharged from TPPs has a limit.
- **Use of beneficiated coal:**
  1. **Aims:** To minimize flyash generation.
  2. **Coal beneficiation** is a process through which the combustion attribute of the coal is enhanced by separating the inorganic impurities (volatile matter or ash) from raw coal.
  3. Each TPP-producing station shall utilise all of the plant's ash produced at a rate of 100%.

Pollution Control Technologies (PCTs) at different stages of a power plant's operations		
Pre-combustion	**In-combustion**	**Post-combustion**
Coal washing and blending	• Installation of **Low NOx Burner (LNB)** and **Over-Fire Air (OFA)** inside the boiler are the in-combustion controls available for **NOx.** • **Limestone injection** into the **furnace** is an effective in-combustion control applicable for **SOx reduction.**	Technologies available for • **SOx emission:** Flue-gas desulfurization (FGD) • **NOx Emission:** Selective Catalytic or Non-Catalytic **Reduction (SCR/SNCR)** • **Particulate Matter (PM) Emission:** Electrostatic Precipitators **(for large PM)** or **fabric filters.**

Challenges
- **High investment:** According to CSE estimates, it will need about one lakh crore (in 2020) to meet emission standards. Hiring qualified labour, purchasing equipment, etc., all demand money.
- **Equipment imported for Pollution Control Technologies (PCTs)** Lack of bidders for the supply of FGD is making it difficult to achieve the deadline for implementation because several FGD components are not produced in India. There isn't enough time to build domestic manufacturing plants in the nation because of deadlines as well.
- The **COVID-19 pandemic's effects** caused a delay in every step of the Flue Gas De-sulphurization (FGD) planning, tendering, and implementation process.
- **Weak penalty for violating emission norms:** Power plants keep running even though they are not meeting emission standards.

Suggestions
- **Discourage/encourage plants:** It should be based on the steps taken to fulfil the deadline by putting policies into place.
- **Collaboration:** The Central Electricity Authority and the Ministry of Power should cooperate to make sure that thermal power facilities adhere to environmental and public health-friendly standards.
- **Emission Data:** For the sake of public study and examination, stakeholders must disclose clearly emission data and their impact close to TPPs.
- **Provide a grant window or subsidy programme with a one-year duration.** This can help to speed up the implementation of the rules and enable fund-raising for the significant up-front expenses.
- **Removing the levy imposed on imported Pollution Control technology (PCTs)** will encourage TPPs to use and import the technology because of the fiscal advantages.

CENTRAL ELECTRICITY AUTHORITY (CEA)

- The Central Electricity Authority (CEA) is a **statutory organization** constituted under **Section 3 (1) of** the repealed Electricity (Supply) Act, 1948 and continued under **Section 70** of the Electricity Act, 2003.
- It was established as a part time body in 1951 and made a full-time body in the year 1975. **As per Section 70 (3) of the Electricity Act, 2003**, the authority shall consist of not more than 14 members, including its chairperson of whom not more than eight shall be full time members to be appointed by the Central Government.
- The **CEA is headed by a chairperson** who, as the Chief Executive of the authority, oversees largely the development of power sector in the country.
- It **advises the government on matters relating to the National Electricity Policy (NEP)** and **formulates short-term and perspective plans** for the development of electricity systems.
- It is the designated authority for cross border trade of electricity.
- It also prescribes the standards on matters such as construction of electrical plants, electric lines and connectivity to the grid, safety and grid standards and installation and operation of meters.
- It is also responsible for concurrence of hydro power development schemes of central, state and private sectors for efficient development of river and its tributaries for power

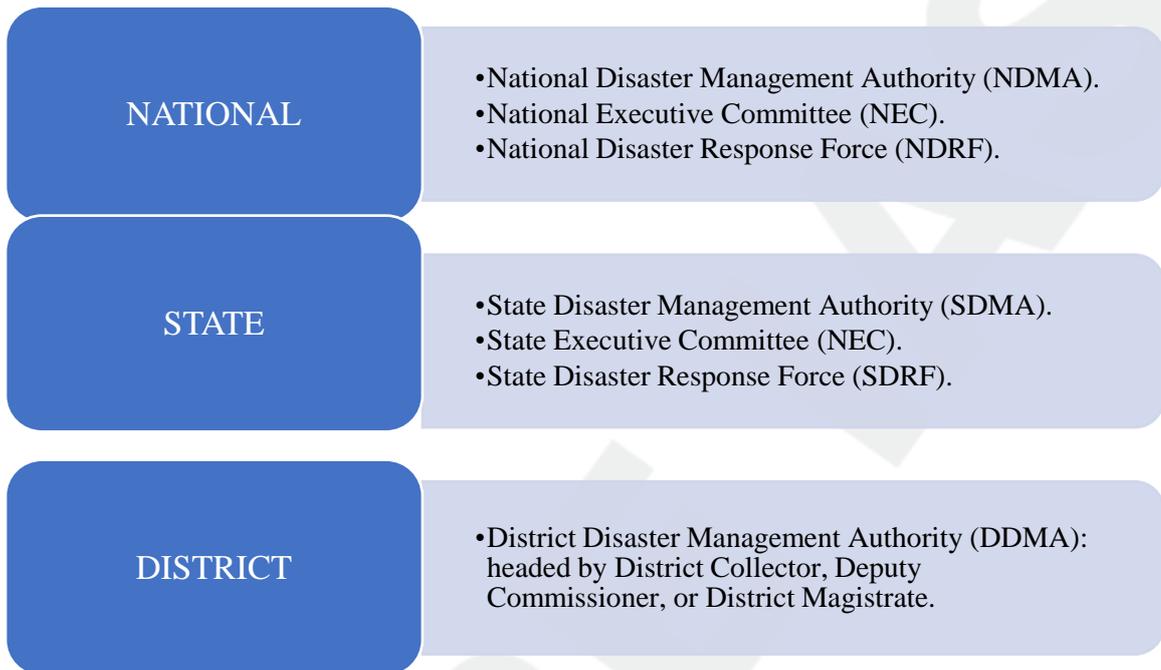## 2.4   DISASTER MANAGEMENT IN INDIA

Latest Context

Recently, three significant **disaster management schemes** totalling more than 8000 crores were launched by the **Ministry of Home Affairs.**

More information regarding news
- The schemes were launched at a meeting with the administrations of the States and Union Territories as part of the **Vision @ 2047 initiative**, which aims to make India more disaster-resilient.
- **Three major scheme includes:**
  - ➢ **Reduce the likelihood of urban flooding in the seven most populous metropolises**: **Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Ahmedabad, and Pune with a Rs. 2,500 crore projects.**
  - ➢ The **National Landslide Risk Mitigation Project,** worth Rs. 825 crores, aims to reduce the risk of landslides in 17 States and Union Territories.
  - ➢ Project of Rs. 5,000 crores to enhance and modernise state-by-state fire services.
- The Ministry also emphasised that the country's approach to disaster management has improved by moving away from the previous strategy, which was reactive and relief-centric, and replacing it with a comprehensive and integrated management approach.

Institutional Mechanisms of Disaster Management in India

NATIONAL	• National Disaster Management Authority (NDMA). • National Executive Committee (NEC). • National Disaster Response Force (NDRF).
STATE	• State Disaster Management Authority (SDMA). • State Executive Committee (NEC). • State Disaster Response Force (SDRF).
DISTRICT	• District Disaster Management Authority (DDMA): headed by District Collector, Deputy Commissioner, or District Magistrate.

Steps were taken in India to move away from the reactionary and relief-centric approach

- **A comprehensive strategy for disaster management:** In addition to rehabilitation and response, the Indian government has put a strong emphasis on grassroots preparedness-based disaster management, including:
  - ➢ Creating National Disaster Mitigation Fund and State Disaster Mitigation Fund in 2021 for mitigation activities.
  - ➢ Implementing flood-prevention measures, such as planting trees on the banks of 13 main rivers.
  - ➢ Developing more advanced early warning systems, such as the India Meteorological Department's (IMD) five-day rainfall and flood projection.
- **Improved and proactive fund distribution:** From 2005–14 to 2014–23, the amount of funds released by the NDRF grew by over three times.
- The Common Alerting Protocol through SMS, the Disaster Management Information System Portal, and the Emergency Response Support System are some of the **Information and Communication Technologies (ICTs) that are being promoted.**
- **Cooperation between the Union and the States:** At the centre and state levels, mechanisms for collective accountability and reaction were built.
- **Community involvement at the grassroots level:** Through awareness campaigns and other initiatives, emphasis has been placed on building the capacity of the disaster's first responders.
- In 350 high-risk, disaster-prone districts, for instance, the Scheme for Training of Community Volunteers in Disaster Response **(Aapda Mitra)** has set a goal of preparing about one lakh young volunteers.

OTHER INITIATIVES FOR DISASTER MANAGEMENT IN INDIA

- Policies like National Disaster Management Plan (NDMP), 2016 and National Policy on Disaster Management, 2009 cover all phases of disaster management: prevention, mitigation, response and recovery.
- NDMA guidelines for disasters like earthquakes, cold wave, cyclone etc.
- Prime Minister released a ten-point agenda on Disaster Risk Reduction.
- National Disaster Response Fund managed by the Central Government.
- India is a signatory to the Sendai Framework for Disaster Risk Reduction.
- India launched a multi-stakeholder global partnership- the Coalition for Disaster Resilient Infrastructure (CDRI) in 2019.

Challenges in Disaster Management

- **Poor coordination/Multiple Agencies**: Union and state governments, as well as organisations like the NDMA and NEC, frequently have overlapping responsibilities.
- **District-level improvement has been sluggish:** In 87 districts across 8 states, district disaster management plans are currently pending.
- **Climate change** has not been fully included in risk mitigation programmes, which has increased the frequency and severity of disasters including cyclones, landslides, flash floods, and landslides.
- Building capacity and educating people the amount of money allotted for creating specialised units for various calamities is insufficient.
- **Inadequate Early Warning Systems (EWSs):** In many disaster-prone locations, they continue to struggle with problems such as a lack of impact-based predictions, inadequate information sharing regarding hazards, etc.
- **Lack of infrastructure** makes it challenging to deliver timely aid during catastrophes as many distant places lack adequate roads, communication systems, and emergency services.
- **Other problems** include poor adherence to regulations including construction codes; slow central help mobilisation; and low public understanding of catastrophe risks and preparatory actions.

Way Forward

- Enhancing communication channels, defining roles and duties, and fortifying coordinating mechanisms.
- Incorporating the effects of climate change into catastrophe preparations and creating efficient local response systems for various calamities.
- Undertaking awareness initiatives to encourage local community preparation for disasters.
- To improve the abilities and understanding of stakeholders, frequent training programmes, simulations, and exercises should be held.
- Extending and enhancing early warning systems, such as seismic monitoring and weather forecasts.

COALITION FOR DISASTER RESILIENT INFRASTRUCTURE (CDRI)

- The Headquarters Agreement (HQA) between India and the Coalition for Disaster Resilient Infrastructure (CDRI) was ratified by the cabinet.
- **According to Section 3 of the United Nations (Privileges & Immunities) Act, 1947,** the Cabinet had authorised in 2022 the recognition of CDRI as an international organisation and the signature of the HQA for the granting of CDRI exemptions, immunities, and privileges.
- Act was passed to put into practise the 1946 UN General Assembly-adopted Convention on the Privileges and Immunities of the United Nations.
- **According to the UN Charter,** the UN and its representatives are entitled to the legal standing, privileges, and immunities required for them to carry out their mandates and achieve their goals on the soil of each of its Member States.
- According to Section 3 of the statute, UN property must be kept secure. Additional foreign bodies were included in the act's expansion.
- By signing HQA, CDRI will acquire an independent and global legal identity that will enable it to perform its duties more effectively on a global scale.
- **It will allow CDRI to**
  - ➢ Deputing experts and also bringing in experts from member countries to India.
  - ➢ Deploying funds globally and receiving contributions from member countries.
  - ➢ Providing technical expertise to assist countries to develop resilient infrastructure.
  - ➢ Leveraging international engagement to foster disaster resilient infrastructure at home.
- **CDRI** is a global partnership of national governments, United Nations agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and academic and research institutions.
- **Aims:** To increase the resilience of infrastructure systems to climate and disaster risks, thereby ensuring sustainable development.
- **Launched** in 2019, at the United Nations Climate Action Summit in New York.
- It is the Government of India's second major global initiative after the International Solar Alliance, and it demonstrates India's leadership in climate change and disaster resilience issues.
- **Members:**
  - ➢ Since its inception**, 31 countries, 6 international organisations and 2 private sector organisations have joined CDRI as members.**
  - ➢ **6 International Organisations:** Asian Development Bank (ADB), World Bank Group, United Nations Development Programme (UNDP), United Nations Office for Disaster Risk Reduction (UNDRR), European Union, European Investment Bank.
  - ➢ **2 Private Sector Organisations:** The Private Sector Alliance for Disaster Resilient Societies and Coalition for Climate Resilient Investment.

2.4.1   URBAN FLOODS

Latest Context

The development of urban planning tools has lagged behind urbanisation and technology improvements. **Urban flooding** is just one of the devastating incidents caused by unplanned growth and climate change, which need an immediate response.

Key Points

- **Urban floods** are defined as excessive runoff in developed urban areas when the drainage system is inadequate and the rainwater has nowhere to go, inundating the region.
- The developed catchments of metropolitan areas raise flood peaks from 1.8 to 8 times and flood volumes by up to 6 times, making them markedly different from rural floods.
- **Examples:** New Delhi (2023), Bengaluru (2022), Hyderabad (2020), etc.

Challenges in Urban Flood Management

- **Weather patterns** have changed as a result of global climate change and the urban heat island effect, and the frequency of episodes of heavy rainfall has risen.
- **Due to insufficient capacity and poor maintenance**, drainage infrastructure is often overrun.
- There is a severe lack of blue and green areas to absorb excess water in cities due to unplanned construction and inadequate land use planning. Floodplains are also being encroached upon.
- **Lack of funding to develop efficient flood management strategies:** For instance, upgrading current infrastructure and buildings to resist floods can be expensive and technically difficult.

Steps were taken to tackle urban flooding

- **Standard Operating Procedures (SOP)** for the Central Government's Atal Mission for Rejuvenation and Urban Transformation **(AMRUT)** to reduce urban flooding.
- The flood management plan offers financial support to the state governments so they may carry out flood management projects in regions that need it.
- The **National Disaster Management Authority (NDMA)** has national guidelines for managing urban flooding.
- The Ministry of Home Affairs' **Uniform System of Alerts and Warnings classifies alerts** into **three stages: Yellow, Orange, and Red.**
- The **IFLOWS-Mumbai integrated flood warning system**. A comparable system **(C-FLOWS)** was also implemented in **Chennai**.

Way Forward

- Adopting integrated ecological strategies that link planning for watershed land use with planning for regional development.
- Increasing the capacity of drainage systems by the removal of encroachments, scientifically redesigned stormwater drainage, etc.
- Making precise maps of flood hazards and zone boundaries. Lakes are given legal protection, encroachments are removed, and other measures are taken to conserve and restore urban water bodies.

2.4.2　FIRES

Latest Context

A **fire** reportedly broke out in a hotel located near the Secunderabad Railway Station.

Key Points

- In highly populated metropolitan centres, crowded marketplaces, industries, slums, residential structures, and public transportation systems in India, fire events frequently occur, resulting in extensive devastation and the loss of life and property.

- **Examples:** Commercial complex fire in Secunderabad, Hyderabad (2023), Hotel fire in Karol Bagh, Delhi (2019), Uphaar cinema, New Delhi (1997) etc.

Challenges in fire risk management

- Unauthorised construction, a lack of routine monitoring and inspection, the use of out-of-date fire safety equipment, the use of low-quality and hazardous fittings, etc. are all results of poor implementation of fire safety standards and building codes by the local authorities.
- Rules are not standard, and **fire safety regulations only apply in some states**, for example, based on building heights.
- **Local governments** are under capacity and resource restrictions.
- I**nfrastructure problems**, such as small streets in heavily populated regions, can prevent fire brigade services from reaching a place.
- Failure to take proper safety precautions and a lack of public awareness to cope with fire occurrences.

Fire safety regulations in India

- To maintain fire and emergency services throughout all states, the **Amended Model Fire Bill, 2019**, was created.
- **Part - IV "Fire & Life Safety"** of the **National Building Code of India 2016** (issued by the Bureau of Indian Standards) covers comprehensive regulations on fire prevention, life safety, and fire protection.
- **For fire safety, the Ministry of Health & Family Welfare** issued stringent requirements in 2020 that included third-party accreditation.
- Hospitals must comply with **NDMA's regulations for fire safety** in public structures.

Way forward

- Adoption and implementation of **uniform fire safety laws** along the lines of **the 2019 Model Fire and Emergency Service Bill in every state.**
- Increase capacity through awareness and mock drills.
- The usage of automatic smoke alarms, sprinklers, gas leakage alarms, etc. with a built-in fire suppression system is an example of technological advancement.
- Integration of fire risk management and mitigation strategies into urban planning and development.
- Frequent inspections of public areas' fire safety hospitals, movie theatres, etc.
- Before granting and renewing permits, licences, approvals, etc., they must undergo careful review and inspection.
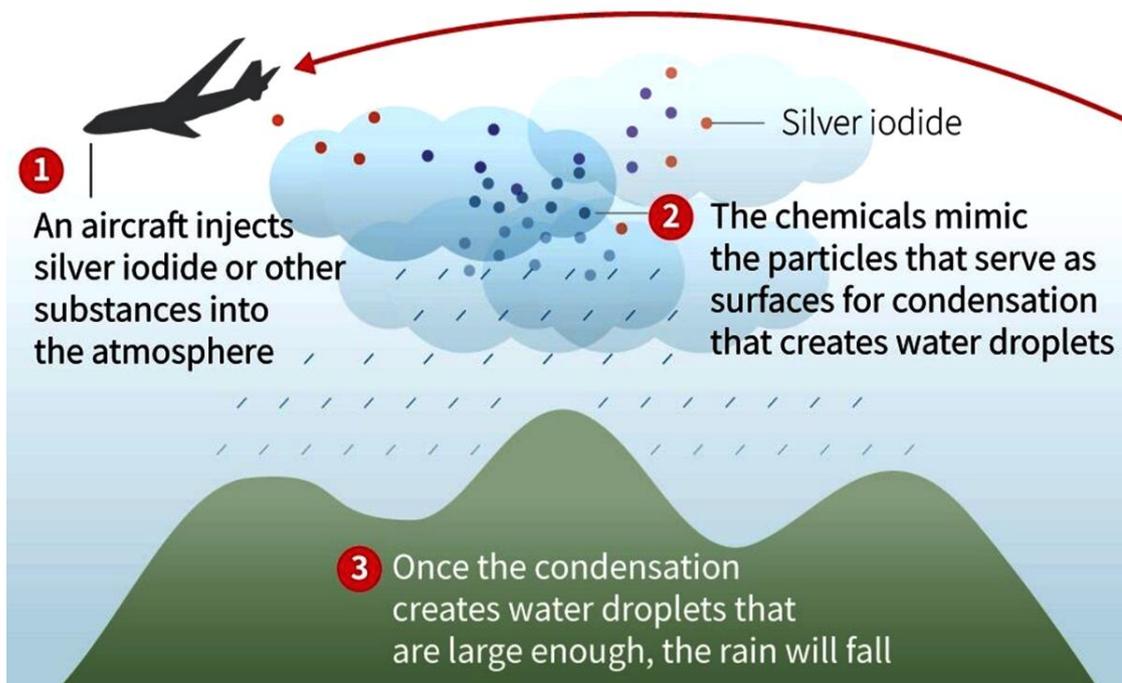
2.5 CLOUD SEEDING

Latest Context

Recently**, IIT Kanpur** conducted a successful test flight for cloud seeding.

Cloud seeding
Traditional method of rainmaking, in use since the 1940s

① An aircraft injects silver iodide or other substances into the atmosphere

— Silver iodide

② The chemicals mimic the particles that serve as surfaces for condensation that creates water droplets

③ Once the condensation creates water droplets that are large enough, the rain will fall

Facts about Cloud Seeding

- **Cloud seeding** is a kind of weather modification technology to create **artificial rainfall**.
- When the amount of moisture in the air reaches a point where it can no longer be contained, rain occurs.
- **Aims:** To facilitate and accelerate that process by making available chemical 'nuclei' around which condensation can take place.
- It only functions when there are sufficient pre-existing clouds in the atmosphere.
- **Two ways of adding nuclei particles to clouds:**
  1. Using large cannons that shoot particles into the sky.
  2. Using aeroplanes that drop the particles from above.
     - ➤ IIT Kanpur used this technique.
     - ➤ The **Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEX) IV** was carried out over Solapur, Maharashtra, during the monsoon seasons of 2018 and 2019.
- **Mainly 8 Chemicals are used in Cloud seeding:** silver iodide, dry ice, Potassium Iodide, Propane, Calcium Carbide, Ammonium Nitrate, Sodium Chloride, and Urea Compound.
- **Clouds:** Clouds are visible accumulations of tiny water droplets or ice crystals in the Earth's atmosphere. Clouds differ greatly in size, shape, and colour. They can appear thin and wispy, or bulky and lumpy. Clouds usually appear white because the tiny water droplets inside them are tightly packed, reflecting most of the sunlight that hits them.

Advantages of Cloud Seeding

- **Management of the drought:** Drought-affected areas might benefit from cloud seeding technology. According to the India Meteorological Department (IMD), 87% of the districts in India are drought-prone.
- **Clearing fog in airports:** Low visibility during the fog season affects many flights, thus using a cloud seeding technique can help to increase visibility.
- **Tackling Forest Fires:** According to India's State of the Forest Report for 2021, 35.46% of the country's forest cover is at risk for wildfires. The area impacted by the forest fires will be reduced with the aid of cloud seeding and rain.
- **Suppress hail:** Seeding causes hail embryos to grow more quickly at a lower level of the cloud, where there is less liquid water and there are fewer updrafts.
- **Rainfall may be redirected if necessary**. **For example,** Beijing employed this technique to prevent any precipitation from falling during the opening ceremony of the 2008 Olympics.
- **Increased availability of water will** result from cloud seeding, which will assist in evenly distributing rainfall over the nation and refuelling aquifers.

Challenges in Cloud seeding

- **Bioaccumulation:** Bioaccumulation is a process of accumulation of chemicals in an organism that takes place if the rate of intake exceeds the rate of excretion. For example**, silver iodide chemical** is most commonly used to seed a cloud is known to be toxic for aquatic life because of bioaccumulation.
- **Increasing carbon footprint:** The greenhouse gases produced when dry ice (carbon dioxide) is used to seed clouds have an impact on climate change.
- **Uncertainty regarding efficacy:** The World Meteorological Organisation issued guidelines in 2017 cautioning its members against altering the weather without first taking into account the high levels of effectiveness uncertainty and the risks involved.
- **Not all cloud types are appropriate:** To efficiently seed clouds, they must be deep enough and at the right temperature (between -10 and - 12 degrees Celsius).
- **Cloud seeding** just redistributes rain in drought-affected areas, which may ultimately have an impact on the **hydrological cycles.**

Conclusion

For addressing water constraints and reducing drought conditions, cloud seeding technology has great potential. However, more advancements are required for it to reach its full potential. The efficiency of cloud seeding operations can be improved by using titanium dioxide coating made using nanotechnology on salt particles. However, to properly understand the long-term effects and possible concerns related to cloud seeding, a significant study must be done.

2.6 SHORTS NEWS

2.6.1 UN'S HIGH SEAS TREATY

Key Points

- The **"high seas" pact**, which was approved at the Intergovernmental Conference **on Marine Biodiversity in Areas Beyond National Jurisdiction (BBNJ)**, aspires to take responsibility for ocean management on behalf of current and future generations.
- It was adopted by the **UNCLOS, or United Nations Convention on the Laws of the Sea.**
- It is **legally binding**. It won't go into effect until 60 nations have ratified it.
- **Key highlights of the treaty:**
  - ➢ Enhancing adaptability and containing rules founded on the polluter-pays concept as well as dispute resolution procedures.
  - ➢ Any operations that are planned outside of the parties' home jurisdictions must be evaluated for their possible environmental effects.
  - ➢ Gives advice, including how to manage the oceans holistically to increase ecosystem resiliency against the negative consequences of ocean acidification and climate change.
  - ➢ Recognise the independence of scientific inquiry, the rights of indigenous peoples and local communities, and the necessity of an equal and fair distribution of rewards.
  - ➢ To safeguard marine biodiversity on the high seas, it seeks to construct substantial marine protected zones in international waterways.
  - ➢ To monitor and enforce adherence to the conditions of the treaty, it also calls for the formation of a Conference of Parties.

2.6.2 BONN CLIMATE MEET

Key Points

- The **Bonn climate summit** was convened to establish the schedule and plan for **CoP 28**, which would take place in **Dubai**.
- **Key Highlights of the conference:**
  1. A draft framework for **Global Stocktake (GST)** was made public:
     - ➢ It is an exercise aimed to evaluate how well individual nations are coping with climate change and determining how best to intensify international efforts in this area.
     - ➢ According to the terms of the 2015 Paris Agreement, **the first GST will occur in CoP 28.**
  2. **Mitigation Work Programme (MWP):** It was established for climate action in 2021 at COP26 in Glasgow, focusing on boosting emission reductions. The rich nations have not yet provided funding or technology transfers to help the poor countries meet their emission objectives, according to their complaints.
  3. **Damage and Loss Principle:** It was the outcome of CoP27. On how it would be financed, developed and developing nations had different opinions.
  4. The **New Collective Qualified Goals (NCQG)** for climate funding before 2025, which were adopted during the 2015 Paris Conference, are expected to fall short of their objective.
  5. The NCQG is being viewed as a **"collective goal"** for both developed and developing nations, however, developed countries are reluctant to accept this.

- **Related News:**
  - ➢ The **'Debt for Nature Swap'** is anticipated to get support from the European Investment Bank this year.
  - ➢ **Debt for Nature Swap** is a deal where governments agree to make conservation pledges in exchange for debt relief.

2.6.3 PARIS FINANCE MEET

Key Points

- The recent Summit for a **New Global Financing Pact in Paris, France**, came to an end.
- **Objective:** To increase low-income states' access to crisis funding, reduce their debt loads, modernise post-war financial institutions, and free up funds to address climate change.

Key Highlights of the Summit

- **Multi-Development Banks (MDBs)** would get access to $200 billion more in lending capacity for emerging economies.
- The **World Bank** proposed catastrophe provisions for debt deals that would suspend debt payments in the event of extreme weather conditions.
- Poorer nations will get $100 billion through **SDRs** (an IMF-provided type of currency).
- To increase the amount of concessional financing available to developing nations, the recycling of SDRs from affluent to poor nations has been advocated.
- To enhance the proportion of renewable energy in **Senegal's energy mix,** a new **Just Energy Transition Partnerships (JETP)** project worth 2.5 billion euros was launched.
- **Polluter taxes** are gaining momentum. A tax imposed on those who harm the environment is known as a pollution tax.
- To evaluate the effect of debt on the ability of low- and middle-income nations, it was suggested to conduct a global expert review on debt, nature, and climate.
- The EU issued a call to action on **"Paris Aligned Carbon Markets"** to use carbon pricing systems to account for at least 60% of world emissions.
- This year (2023), the long-delayed $100 billion climate funding objective will be achieved.

2.6.4 GLOBAL ENVIRONMENT FACILITY

Key Points

- The governing body of the **Global Environment Facility (GEF)** has authorised the payment of USD 1.4 billion to speed up efforts to address the climate, biodiversity, and pollution crises at **the 64th GEF council meeting in Brazil.**
- This is the **second work programme** for the GEF-8 financing term, which spans 2022 to 2026.

Key Highlights of the Meeting

- **Global Biodiversity Framework Fund:**
  - o The **Global Biodiversity Framework Fund (GBFF),** which will be used to support the execution of the **Kunming-Montreal Global Biodiversity Framework (KMGBF),** has been approved for creation by the governing board.

- o **This fund** is essential because throughout the GEF-8 period, about half of its funds will be used for initiatives involving biodiversity.
- **Fund Allocations:**
  - o Indigenous Peoples and local communities **(IPLCs)** will get 20%, **GEF** agencies will receive 25%, **SIDS** (Small Island Developing States) would receive 36%, and **LDCs** (Least Developed Countries) will receive 3%.
  - o While the allocations for SIDS and LDCs will be reviewed three years after ratification, the allocation for IPLCs will be reviewed two years after the ratification in August.

Facts about Global Environment Facility
- **On the eve of the 1992 Rio Earth Summit, the GEF was founded.**
- It is a **group of funds** devoted to addressing issues including pollution, climate change, biodiversity loss, and pressures on land and ocean health.
- An Assembly, a Council, a Secretariat, 18 agencies, a Scientific and Technical Advisory Panel, and an Evaluation Office make up its distinctive governance system.
- **It provides funding for five significant international conventions:**
  - o The United Nations Convention to Combat Desertification (UNCCD) (adopted in 1994).
  - o The Minamata Convention on Mercury (signed in 2013 and entered into force in 2017).
  - o The Stockholm Convention on Persistent Organic Pollutants (POPs) (adopted in 2001 and entered into force in 2004).
  - o The United Nations Framework Convention on Climate Change (UNFCCC) (signed in 1992 and entered into force in 1994).
  - o The United Nations Convention on Biological Diversity (UNCBD) (entered into force in 1993).
- There are **184 members**, **including India**.
- **Washington, D.C.** serves as the home of its secretariat.

- **As the GEF Trustee,** the **World Bank** manages the GEF Trust Fund (donor contributions).

What is GEF Council?
- The **GEF's primary governing body,** the Council, is made up of 32 members elected by GEF member nations (14 from developed, 16 from developing, and 2 from economies in transition).
- **With Bangladesh, Sri Lanka, Bhutan, Nepal, and the Maldives, India has joined the GEF Executive Council as a permanent member.**
- The periods between rotations of council members are set by each constituency.
- The **Council convenes twice a year.**
- The operational policies and programmes for GEF-financed initiatives are developed, adopted, and evaluated by the Council.
- The work programme (projects presented for approval) is also reviewed and approved, with choices reached by consensus.

2.6.5   WORLD ENVIRONMENT DAY (WED) 2023

Key Points
- **On June 5, 2023,** World Environment Day will have been in existence for 50 years.
- Since 1973, WED has been marked on 5 June as a part of the UNEP's efforts to raise awareness about the need to protect life on Earth.
- Every year, a certain nation serves as the **host** and the **theme** for World Environment Day.
- **Host country:** West African country of Côte d'Ivoire, in partnership with the Netherlands.
- **Theme:** 'Beat Plastic Pollution.'
- **Under the leadership of India**, **the 45th World Environment Day** with the **same theme** was celebrated.
- **On the occasion of WED 2023,** the Ministry of Environment, Forest, and Climate Change unveiled the **Amrit Dharohar and MISHTI (Mangrove Initiative for Shoreline Habitats and Tangible Incomes) programmes.**

UNITED NATIONS ENVIRONMENT PROGRAMME
- A significant international environmental organisation, the UNEP was founded on June 5th, 1972.
- **Functions:** It establishes the global environmental agenda, advances sustainable development within the framework of the United Nations, and acts as a strong voice for the defence of the environment worldwide.
- **Major Reports:** Emission Gap Report, Adaptation Gap Report, Global Environment Outlook, Frontiers, Invest into Healthy Planet.
- **Major Campaigns:** Beat Pollution, UN75, World Environment Day, Wild for Life.
- **Headquarters:** Nairobi, Kenya.

2.6.6 CLIMATE CHANGE AND FOOD CHOICES

Key Points

- A recent study emphasised the need of altering eating patterns and food preferences to cut emissions and combat global warming.
- According to the study, more than 40% of the emissions from the world's food supply chain occurred in 2019 as a result of food consumption in the top 5 emitters, China, India, Indonesia, Brazil, and the US.
- Owing to the following reasons, food choices are progressively causing global emissions:
  ➢ Increased ruminant enteric emissions, deforestation, etc. due to dietary shift towards animal-based products such as red meat, dairy, and farmed shrimp.
  ➢ preference towards processed and packaged items.
  ➢ Food choice globalisation (increases emissions from transportation, refrigeration, etc.).
  ➢ consumption of unsustainable food on a large scale (increase in emissions due to excessive use of synthetic fertilisers).
  ➢ **Food wastage:** Food waste is responsible for at least 6% of worldwide greenhouse gas emissions.
- **Note:** 95% of the increase in global emissions related to food between 2000 and 2019 may be attributed to a significant increase in the use of animal-based products.
- **The way forward:** promoting plant-based protein-rich meals or plant-based sources of protein (such beans, grains, etc.); alternatives like lab-grown meat; favouring locally grown and seasonally appropriate foods; putting an emphasis on unpackaged and sustainably produced whole food items; reducing food waste at home, etc.

2.6.7 SUBSIDIES AND CLIMATE CHANGE

Key Points

- **Subsidies** do not contribute to the battle against climate change, according to a recent World Bank report.
- **Subsidy:** subsidy is a transfer of money from the government to an entity. It leads to a fall in the price of the subsidised product.
- **Climate Change:** Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions.
- **Highlights of the Report:**
  ➢ The report emphasises the detrimental effects of spending trillions of dollars on inefficiently subsidising the agricultural, fishery, and fossil fuel industries, which exacerbates climate change.
  ➢ These subsidies total more than 8% of the global GDP.
  ➢ Subsidies are distributed inequitably and asymmetrically among industries and nations.
- **Impacts of Subsidies:**
  ➢ The annual loss of 2.2 million hectares of forest, or 14% of the world's deforestation, is attributed to agricultural subsidies.
  ➢ The use of fossil fuels, which is encouraged by subsidies, is a major contributor to the 7 million premature deaths caused by air pollution each year.

> ➤ Fish populations are declining, fishing fleets are getting bigger, and profits are declining as a result of the $35 billion in annual subsidies given to the fishing industry.

- **Guiding Principles for Subsidy Reforms:**
  - ➤ overcome credibility and gaps Build public acceptance.
  - ➤ Introduce complementary measures to enhance effectiveness.
  - ➤ Reduce price shocks through compensation and social protection.
  - ➤ Smooth the transition by step-wise reductions in harmful subsidies.
  - ➤ Redistribute revenue through long-term reinvestments with progressive benefits.

2.6.8 DRAFT GREEN CREDIT PROGRAMME (GCP) IMPLEMENTATION RULES 2023

Key Points

- A draft of the GCP Implementation Rules 2023 was made public by the Ministry of Environment, Forests, and Climate Change (MoEF&CC).
- **By the Environment (Protection) Act of 1986,** MoEF&CC decided to implement GCP and published these draft regulations.
- **Draft GCP Implementation Rules 2023:**
  1. **Green Credit (GC)** means a singular unit of an incentive provided for a specified activity, delivering a positive impact on the environment.
  2. **Objectives of GCP:**
     - ➤ Create a market-based framework for awarding GCs to individuals, organisations, local governments, gramme panchayats, the private sector, etc. for acts that promote the environment.
     - ➤ Develop a mass movement focused on protecting the environment and achieving Mission LiFE's goals.
  3. **GCs** will be tradable outcomes that may be traded on a platform for the local market. The identical action that generates **GCs may also produce Carbon Credits** under the carbon market.
  4. The **GCP** is administered by the Indian Council of Forestry Research and Education, which is also in charge of its implementation, management, and monitoring.
- To achieve the aims of **"Mission LiFE"** and align with India's climate targets under the Paris Agreement, GCP was introduced during the Union Budget 2023.
  - ➤ GCP aims to use a competitive market-based strategy for Green Credits to encourage diverse stakeholders' voluntary environmental initiatives.
  - ➤ The Paris Agreement's Article 6 permits the exchange of carbon credits through market mechanisms.

2.6.9 SHORT-LIVED HALOGENS (SLH)

Key Points

- According to recent research, **oceans** contribute 8–10% of the planet's cooling via emitting short-lived halogens.
- **Chlorine, bromine, or iodine**-containing gases are classified as SLHs (lifetime of less than six months).
- Abiotic sources from ocean and tropospheric chemistry, as well as marine phytoplankton and algae, are the **sources.**
- **Impact:** SLH from the seas slows warming by reducing the production of cooling aerosols and ozone.
- **Water vapour concentrations and the lifespan of methane** in the atmosphere are both increased by SLH.

2.6.10 LEED RATING SYSTEM

Key Points

- In terms of **Leadership in Energy and Environmental Design (LEED)** net zero certifications, India does better than the US and China.
- The **LEED grading system** offers a framework for healthy, efficient, carbon and cost-saving green buildings.
- The **U.S. Green Building Council** created the certification programme, which is **managed by Green Business Certification Inc.**
- Buildings that have achieved one of **the four certification levels—Certified, Silver, Gold, or Platinum—are recognised.**
- The **Indian Green Building Council (IGBC)** administered the LEED India Programme.

- In addition to receiving a LEED certification, **LEED Zero acknowledges projects** that have achieved **net zero or net positive status** in the areas of carbon, energy, water, and waste.
- **73 projects in India are LEED Zero certified**, making over 45% of the more than 150 LEED Zero certifications worldwide.
- **In India, the building and construction sector is responsible for around one-third of all carbon emissions.**
- States with the highest certification rates include **Haryana and Tamil Nadu**.
- The **DLF group of India** leads the world in the number of LEED Zero certifications.
- **The Energy & Resources Institute (TERI) and the Ministry of New and Renewable Energy** jointly established India's green building assessment system, known as the **Green Assessment for Integrated Habitat Assessment (GRIHA).**
- The **GRIHA grading scale** has five stars. The **rating is valid for five years**.

Other Steps for Green Building in India

IGBC Rating Systems	Energy Conservation Building Code devised by Bureau of Energy Efficiency (BEE)	BEE Rating Systems for Commercial Buildings
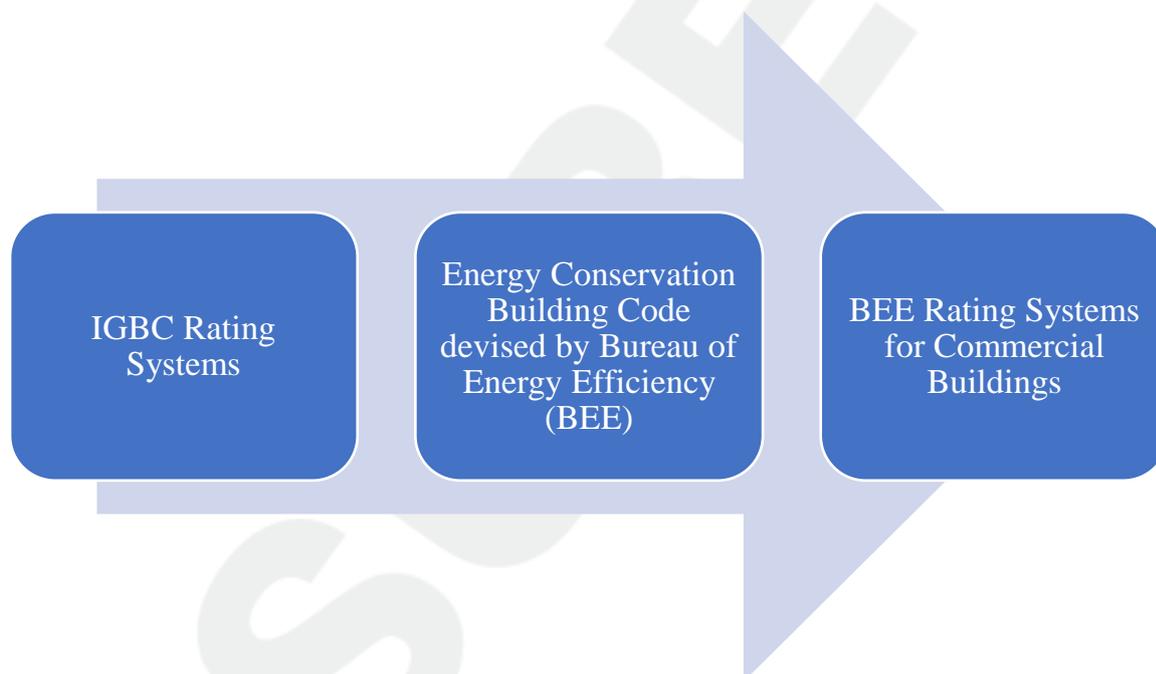
2.6.11 NATIONAL WATER AWARDS

Key Points
- **In 2022,** the **President of India** presented the fourth National Water Awards**. The Best State winner is Madhya Pradesh, and the Best District winner is Ganjam in Odisha.**
- **About National Water Awards:**
  - The Department of Water Resources, River Development, and Ganga Rejuvenation **first began operations in 2018.**
  - 2019 and 2020 each had a second and third edition.
  - In 2021, no awards were presented because of the COVID pandemic.
- **Objective:** To persuade diverse stakeholders to embrace a comprehensive strategy for the nation's water resources management.

2.6.12 DESICCATION-TOLERANT VASCULAR (DT) PLANTS

Key Points

- **In India's Western Ghats, 62 desiccation-resistant vascular plant species** that may **be used in agriculture** were found by a recent study.
- **DT** When water becomes accessible again, plants may recover from severe dehydration in which they can lose up to 95% of their water content.
- Vascular and nonvascular plants that are resistant to desiccation are referred to as **"resurrection plants"** in general.
- They are the main inhabitants of rock outcrops in tropical areas.
- Bedrock or other geologic formations are exposed in plain sight at the Earth's surface **as rock outcrops.**

2.6.13 PROTOSTEROL BIOTA

Key Points

- **Protosterol Biota** are thought to have lived in the oceans more than 1.6 billion years ago (Proterozoic Eon).
- These microscopic organisms are **eukaryotes** and are responsible for the origin of life on Earth.
- **Eukaryotes** are single-celled or multicellular organisms that include membrane-bound organelles in addition to their nucleus.
- **Fungi, plants, animals, and single-celled organism like amoebas** are examples of modern forms of eukaryotes.

2.6.14 BAN ON DRUGS HARMFUL TO VULTURES

Key Points

- Two more drugs that are harmful to vultures were recommended for the ban by the **Drugs Technical Advisory Board (DTAB).**
- **To protect vultures,** DTAB agreed to ban the production, sale, and distribution of the drugs **ketoprofen and aceclofenac** used to treat livestock animals.
- The **DTAB** is the country's **highest statutory decision-making body** for technical drug-related issues.
- It is a part of the Ministry of Health and Family Welfare's Central Drugs Standard Control Organisation **(CDSCO).**
- **Non-steroidal anti-inflammatory drugs (NSAIDs)** used in veterinary medicine **include ketoprofen, aceclofenac, diclofenac, and nimesulide**. These NSAIDs are toxic to vultures and other birds of prey.
- **India has already banned diclofenac.**
- Some NSAIDs are not completely metabolised by vultures, which harms the kidneys of the birds.
- Cattle that have been treated metabolise **NSAIDs within 3–4 days of therapy**, thus even if they pass away after that time has passed, they won't endanger vultures.
- **India is home to nine different vulture species.** These include the **Oriental White-backed Vulture, Slender billed Vulture, long billed Vulture, Egyptian Vulture, Red Headed Vulture, Indian Griffon Vulture, Himalayan Griffon, Cinereous Vulture and Bearded Vulture or Lammergeier.**

- The population of the **critically endangered White-backed, Slender-billed, and Long-billed vultures** has significantly decreased during the past several decades.

2.6.15 RIVER SAND MINING

Key Points
- The **National Green Tribunal (NGT)** has mandated that to mine river sand, approval from the relevant SPCBs must be obtained.
- To ensure that the rules are consistently applied, NGT instructed MoEFCC to provide them within two months.
- **With effect from 1 September 2023**, no further river sand mining will be allowed in the nation without receiving these consents.
- **Sand mining** is the process of removing sand, often from an open pit but occasionally from inland dunes located near riverbeds, seas, and beaches.
- It is categorised as **a "minor mineral" under section 3(e) of the Mines and Mineral (Development and Regulation) Act of 1957, or MMDR Act** and **state governments** have administrative responsibility over it.
- **Impact of sand mining:**
  1. shift the riverbed, make the river shift its path, erode the banks, and cause flooding.
  2. Destroys the habitat of aquatic species and animals in addition to having an impact on groundwater recharge.
- **Steps were taken to curb sand mining:**
  1. The **MoEFCC's 2016 Sustainable Sand Mining Management Guidelines** promote ecologically responsible management practices and scientific sand mining.
  2. The **Ministry of Mines' 2018 Sand Mining Framework** includes provisions for alternate sand sources, such as manufactured sand made from crushed rock fines (crusher dust), etc.

## 2.6.16 MARINE NOISE POLLUTION

Key Points
- A report on a significant threat to marine species i.e., **noise pollution,** was published by the **Convention on the Conservation of Migratory Species of Wild Animals (CMS).**
- The **report focuses on three main causes of noise pollution:**
  1. Pile driving (used for offshore wind farms and other marine infrastructure).
  2. Shipping.
  3. Seismic airgun surveys (used in oil and gas exploration).
- The **solution offered to reduce noise pollution:**
  1. Changes in ship design and propeller technology, and enhancing operating conditions.
  2. Marine Vibroseis, is a technology designed to produce controlled vibration as compared to airgun.
  3. Lower-frequency seismic signals, etc

2.6.17 INDIAN OCEAN DIPOLE (IOD) AND EL-NINO

Key Points

- The **Indian Ocean Dipole (IOD),** as its name suggests, is an ocean-atmosphere interaction that takes place in the Indian Ocean and is quite comparable to the El Nino variations in the Pacific Ocean.
- **Although this year's El Nino is already well-established in the Pacific Ocean**, a positive IOD development is also anticipated by many meteorological organisations.
- The difference in sea surface temperature between the Indian Ocean's eastern and western sides is called **IOD.**
- **Relation between IOD and El Niño-Southern Oscillation (ENSO):**
  o From west to east, and in the opposite directions at the upper level, the air moves through the Indian Ocean.
  o A normal year will see warm water from the west Pacific pass into the Indian Ocean, causing the air to rise and enhancing air circulation.
  o The Indian Ocean side of the Pacific grows cooler during EL Nino because the western side of the Pacific is cooler than usual, which promotes the growth of a positive IOD.
  o **IOD** is also connected to LA-Nina in a negative way. Although **external factors** like ENSO can induce IOD, according to researchers, local circulations frequently play a major role in its development.
- A **positive IOD** encourages rainfall along the African coast and in the Indian subcontinent while suppresses it in the eastern Indian Ocean, while **the opposite occurs during a negative IOD.**
- **IODs** have significantly less of an impact than ENSO occurrences, although they can still mitigate the effects of ENSO.
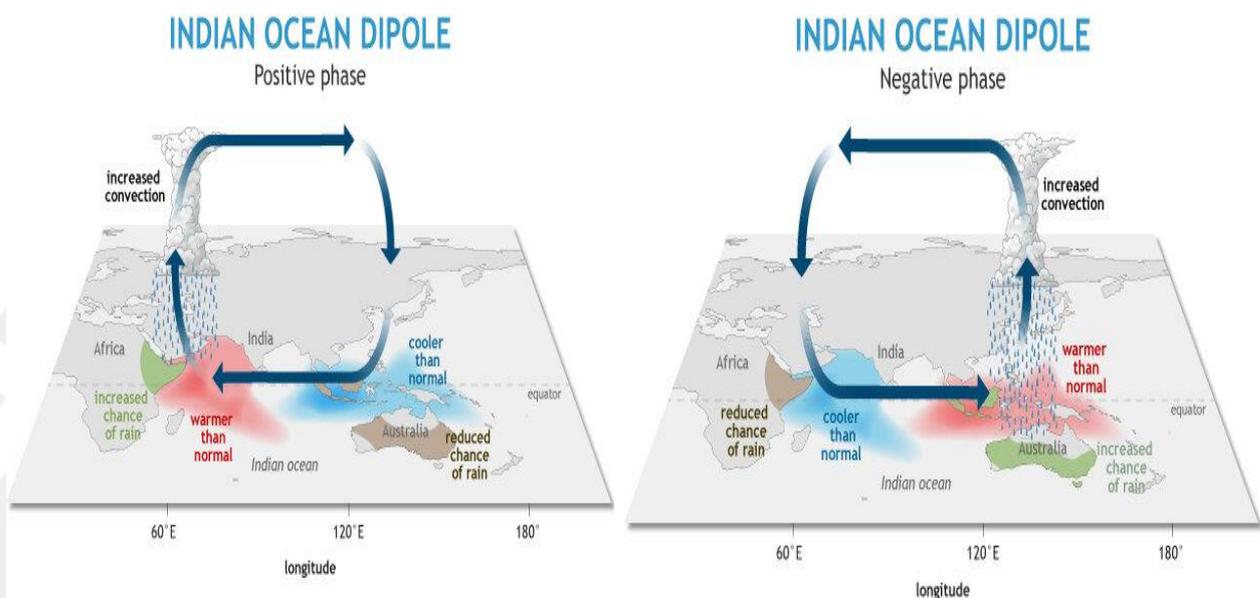
2.6.18 CYCLONES IN ARABIAN SEA

Key Points
- **Cyclone Biparjoy,** which was formerly scheduled to make landfall in Pakistan, is now forecast to track near the **coast of northern Gujarat.**
- Normally, cyclones in the Arabian Sea do not advance towards the Indian shore.
- **More than 75%** of them go in a northwards or northwestern direction, with a course towards **Pakistan, Iran, or Oman**.
- A recent study found that the frequency of **cyclonic storms (CS)** increased by 52% in the Arabian Sea between 2001 and 2019, rendering India's west coast more susceptible.
- **Cyclonic Storms (CS)** are increasing in the Arabian Sea because of
  1. the warming of the Arabian Sea's deeper waters as well as its sea surface waters.
  2. Warm weather is particularly conducive to cyclones rapidly intensifying; therefore, it can maintain intensity for a longer time.
  3. **El Nino Modoki** phenomena are becoming more frequent, which creates ideal circumstances for cyclone development over the Arabian Sea.
  4. El Nino Modoki creates dry cold conditions in the eastern and western Pacific and warm wet conditions in the central Pacific.

2.6.19 EARTHQUAKES IN JAMMU & KASHMIR AND LADAKH

Key Points
- Within 24 hours, several **mild-intensity earthquakes** occurred in Jammu & Kashmir and Ladakh.
- The Himalayas' geology renders the area particularly susceptible to earthquakes because of the **continuing collision of the Indian and Eurasian tectonic plates.**
- In a north-northeasterly direction, the Indian plate is subducting beneath the Eurasian plate.
- **Three main tectonic units** make up the geology of the Himalayas on its southern side:
  1. Main Central Thrust (MCT).
  2. Main Boundary Thrust (MBT).
  3. Himalayan Frontal Thrust (HFT) or Main Frontal Thrust (MFT).
- **The MCT fault**, a north-dipping fault that delineates the tectonic boundary between the greater and lesser Himalayas, is the highest and oldest of them.
- **MBT** divides the lesser and sub-Himalayas, while the youngest and southernmost thrust is the HFT.
- All three of these faults intersect along the basal separation plane, or Main Himalayan Thrust, or decollément in geophysical parlance.
- MBT and HFT faults are seen as being more active than MCT faults in the present.
- In the Central Himalayas, there is a 700 km section known as the **"Central seismic gap"** where the MFT has not ruptured for many generations.
- High-risk zones for potential major earthquakes are seismic gap regions.

Major Faults in Himalayas

2.6.20 GROUNDWATER EXTRACTION TILTED EARTH'S SPIN

Key Points
- According to a recent research, **groundwater extraction** alone between 1993 and 2010 shifted the earth **eastward by over 80 cm.**
- Geographic north and south poles of the planet are where its axis crosses its surface, although they are not fixed.
- The Earth's mass distribution changes, which causes changes in the axis and, consequently, the poles.
- The distribution of mass on the earth is determined by the movement of water.

3.   POLITY

3.1   THE NEW PARLIAMENT OF INDIA

Latest Context

Recently, the new Parliament building was inaugurated by the Prime Minister of India. On this occasion, the Prime Minister of India also installed the historic **"Sengol"** near the chair of the Lok Sabha Speaker.
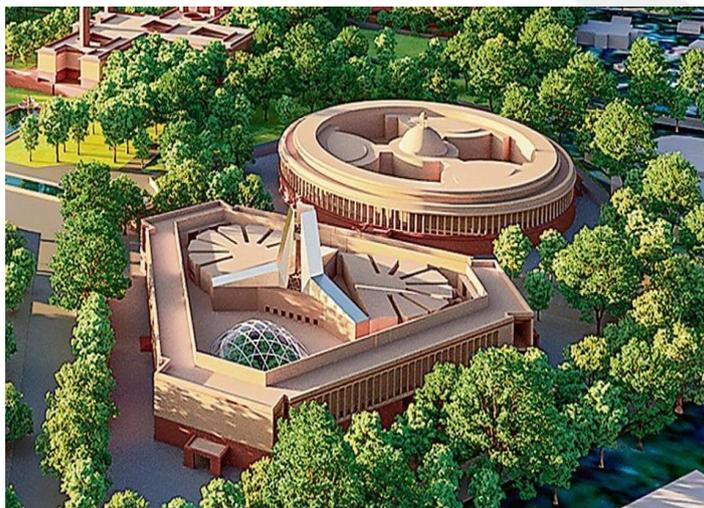
Sengol: It is a sceptre signifying authority and power. By going to Tamil History, Sengol **"symbolized the transfer of the power from the British to India in 1947"** This historical sceptre was received by the former Prime Minister of India Pandit Jawahar Lal Nehru **from Lord Mountbatten** to represent the transfer of India from the British and was kept in the museum of Allahabad.

Background

*   In 2012. the then Lok Sabha Speaker Meira Kumar set up a committee to suggest alternatives to the old building by keeping its stability in mind. Accordingly, several proposals have been forwarded for a new parliament building to replace the old complex of Parliament.
*   In 2019, the Government of India launched a **Central Vista Project** that comprises several other projects like revamping the Kartavya Path, and construction of PM residence and office.

Unique Features of the New Parliament Building

- As per the **chief architect** of the Central Vista Project **Bimal Patel,** the entire complex will be of **hexagon shape**
- It will have a life span will be more than 150 years. Furthermore, it will be **earthquake-resistant** and a different style of architecture from India has been incorporated in it.
- The new parliament complex's budgetary allocation is a **$2.4 billion project.**

Distinctive Features from Old Parliament Complex:

OLD PARLIAMENT BUILDING	NEW PARLIAMENT BUILDING
The Old Parliament Building is circular in shape and it was erected in 1927	The New Parliament Building is triangular in shape
Its architect was **Sir Edwin Lutyens** and **Herbert Baker**	Its architect is **Bimal Patel**
The total expenditure to build this building was **Rs. 83 lakhs**	The cost to build this building is **Rs 861.9 Crore.**
It **contains a** Central Hall	It **does not** consist of a Central Hall
It consists of just **800 seats** that are insufficient to conduct a joint parliamentary session. Therefore, the lack of space for movement poses a significant security risk.	It consists of **1272 seats** to overcome the problem of conducting joint parliamentary sessions.
It has the capacity to **accommodate 543 seats** in Lok Sabha and **250 seats in Rajya Sabha**.	The new complex has a capacity of **888 seats in the Lok Sabha** and **384 seats in the Rajya Sabha**.

Significance of the New Parliament Building

- It highlights the **rich democratic traditions** of India from the Vedic period to the present day
- The Constitution Hall of this new Parliament building is meant to showcase a series of the **"growth of democracy"**. This hall is inspired by the **Sri Yantra** which is used by Hindus for worship and is considered a source of **"pure energy".**
- The Constitution Hall having a digitized copy of the Indian Constitution is the **best example of modernity** because it also houses a **Foucault's Pendulum to demonstrate the rotation of the earth**.
- The New Parliament building will help in **forming a political consensus** and will act as a symbol of freedom from **the mindset of slavery** and will help in building a distinct identity.
- It will be starting point of the country's journey towards excellence in every field.
- It will be a **"Shraddha Sthal"** because it will serve as a platform to fulfil the ambitions of the people of India.

3.2   SEDITION LAW IN INDIA

Latest Context

- The 22nd Legislation Commission has endorsed the continuation of the law on sedition in its 279th Report on "Usage of the Law of Sedition."

Definition of Sedition Law:
- Sedition is defined in Section 124A of the Indian Penal Code (1870) as "whoever, by words, either spoken or written, or by signs, or by visible representation, or otherwise, brings or attempts to bring into hatred or contempt, or excites or attempts to excites disaffection toward, the Government established by law".

Over time, the Sedition statute has drawn criticism:
- The Supreme Court ruled in the Shreya Singhal case (2015) that vague and overbroad offences mentioned in the law would be unconstitutional and could not be justified as a restraint on free speech.
- Fear of being accused of sedition can chill dissent by discouraging people from making genuine criticisms and from speaking their minds, which can result in self-censorship.
- Low percentage of convictions: Between 3 and 33% of cases brought under Section 124A have resulted in convictions over the years, and in 2020, the percentage of cases still pending in court was at its highest at 95%. As a result, just filing Sedition cases can lead to punishment.
- Allegations of Misuse: It is quite challenging to obtain bail after being detained under the sedition statute because the trial process may drag on for a very long time. Harassment of innocent individuals results from this. In the Vinod Dua v. Union of India case, the Supreme Court invalidated sedition-related FIRs and issued a warning against erroneous use of the law.
- Individuals who attempt to endanger India's unity, integrity, or security are already subject to rules that permit preventive detention and the installation of limitations under Section 144 of the Code of Criminal Procedure, 1973. There may not be a need for a separate law under Section 124A.
- Other jurisdictions have repealed the sedition law: The UK did so formally in 2009, noting the law's detrimental impact on freedom of speech and expression. It was repealed in Singapore and Australia as well.

Judiciary's interpretation of Section 124A over the years:
- Romesh Thapar v. State of Madras, 1950: The Supreme Court stated that unless criticism of the government is such as to jeopardise its security or tend to topple the state, it cannot be viewed as a justification for limiting freedom of expression and of the press.
- In Kedar Nath Singh v. State of Bihar, 1962, the Supreme Court upheld Section 124A's legality. The Court made it clear that the State requires defence against forces attempting to threaten its security and stability. It was clarified, nevertheless, that only comments with the potential to stir up "public unrest" would be considered sedition.
- In Vinod Dua v. Union of India, 2021, the Supreme Court ruled that citizens have the freedom to express their opinions and criticism of government actions as long as they do not urge others to commit acts of violence against the legally established government.
- In the case of S.G. Vombatkere v. Union of India, 2023, the Supreme Court ordered that all State Governments as well as the Central Government suspend all ongoing trials, appeals, and actions resulting from charges brought under Section 124A. It asserted that the strictures of Section 124A of the IPC were designed for a time when this country was under the colonial authority and were out of step with the current social climate.

Arguments given by law commission for retention of Section 124A

- Section 124A is useful in fending off elements that are anti-national and separatist in order to protect the unity and integrity of India.
- Sedition is a law that is a reasonable restriction under Article 19 of the Constitution, which guarantees everyone the fundamental right to freedom of speech and expression.
- Existence of Counter-Terrorism Legislations Doesn't Fill Section 124A's Gap: In the absence of a provision like Section 124A of the IPC, any expression that calls for violence against the government would be subject to strict laws like the Unlawful Activities (Prevention) Act and the National Security Act.
- Law to be assessed objectively and without reference to Colonial Legacies: Just because a particular legal provision has colonial roots does not make the case for its repeal.
- Every jurisdiction has different realities: Competing jurisdictions' courts, like those in the US, the UK, etc., had their own histories, geographies, populations, diversity, laws, and other specifics. Some of these nations have combined their anti-terrorism laws with their anti-sedition laws. This may not be feasible given the conditions in India.
- Misuse is not a reason to remove: By establishing sufficient procedural protections, any purported misuse can be curbed. The security and integrity of the nation may be jeopardised by a complete repeal of the clause.

Recommendations by the Law Commission

Current scenario	Law commission proposal
Kedar Nath Judgment of 1962 is included into Section 124A of the IPC.	By amending the definition of sedition to include the phrase "with a tendency to instigate violence or provoke public disruption."
Currently, Section 124A carries a maximum three-year prison sentence or a life sentence. The least punishment would be a fine, and the maximum sentence would be life in jail. There would be no time in between.	Proposed: Extending the sentence to a maximum of seven years in prison or life. This eliminates the judges' extensive sentencing discretion.
There is no procedural safeguard.	"Unless a police official, not below the level of Inspector, conducts a preliminary inquiry and granted permission for registering a First Information Report," no FIR for seditious activity may be filed.

Other ideas in this regard include:

- Application is restricted: In its 2018 consultation paper on sedition, the Law Commission stressed that Section 124A should only be used when the goal of any act is to disturb public order or topple the government through force and criminal methods.
- To ensure that unlawful arrests do not occur, police officers should receive thorough training on the specific requirements of Section 124A of the IPC, including its elements, scope, and legal criteria.

3.3   GRIEVANCE REDRESSAL ASSESSMENT & INDEX (GRAI)

Latest Context:

- The Grievance Redressal Assessment & Index (GRAI) for the year 2022 was introduced by Union Minister of State for Personnel, Public Grievances, and Pensions.

Grievance Redressal Assessment & Index 2022:

- The Department of Administrative Reforms and Public Grievances (DARPG), which is part of the Ministry of Personnel, Public Grievances & Pensions, conceptualised and constructed GRAI 2022.
- These reports are a component of the DARPG's 10-step Centralized Public Grievance Redressal and Management System (CPGRAMS) reforms, which aim to speed up the process of resolving public complaints while also increasing its quality.
- The Index's goal is to create an organizationally comparative picture and offer insightful information about the mechanisms for resolving complaints' strengths and potential for improvement (GRM).
- The Index is based on 12 Indicators distributed across 4 important dimensions: Efficiency, Feedback, Domain, and Organizational Commitment.
- Based on a thorough index, 89 Central Ministries and Departments were evaluated and ranked.
- Central Ministries and Departments' average turnaround time decreased from 32 days in 2021 to 27 days in 2022.

Benefits of Grievance Redressal Mechanism:

- To ensure the principle of "Minimum Government and Maximum Governance"
- It provides a channel for citizens to voice their grievance
- The feedback from the citizens helps the Ministry to understand the quality of its services
- It ensures accountability, transparency, trust-building and improved service delivery.

Grievance Redressal Mechanism (GRM):

- According to the 2nd ARC Report, GRM is one of the key mechanisms that may be used to make government more centred on the needs of its citizens.
- The fundamental tenet of a grievance redressal system is that a citizen should have access to a mechanism to have a grievance resolved if the promised level of service delivery is not met or if a right of a citizen is violated.
- Two nodal organisations that handle public complaints are the Directorate of Public Complaints at the Cabinet Secretariat and DARPG, the Ministry of Personnel, Public Complaints, and Pensions.

CPGRAMS - 10 STEP REFORMS:

1. CPGRAMS 7.0 Universalization
2. AI in CPGRAMS
3. CPGRAMS in all Regional Languages
4. Grievance Redressal Index
5. Feedback Call Center
6. CPGRAMS in Citizen Service Centers (CSCs)
7. Sevottam Capacity Building Programs
8. Monthly Progress Reports
9. Data Strategy Unit
10. One Nation One Portal

Citizen Centric Administration:

The notions of good governance and citizen-centric administration are closely related, according to the 2nd ARC Report. In addition to GRM, other mechanisms that can be used to make the administration more citizen-centric include the adoption of modern technology that is appropriate.

- The right to information.
- Charters for Citizens.
- A neutral assessment of the services.
- Participation of engaged citizens

Issues with the current public grievance system:

- Low levels of awareness of citizens' rights and responsibilities: People are unaware that many government departments have a grievance procedure in place.
- The judiciary is overworked: Although departments have internal systems in place to address employee grievances, these systems are not operating well, and when disputes are not resolved, petitions are filed with the courts on trivial matters.
- Non-Uniformity: There are significant differences across Ministries and other organisations in terms of the grievance handling process, procedure, and structure.
- Lack of statutory support: Unlike RTI, GRM is not considered as a need in many departments.
- Lack of resources: Public grievance cells frequently experience a staffing and resource shortage. Furthermore, these cells have not been given enough power.
- CPGRAMS failing to act as a facilitator: In a number of instances, the complainant was instructed to contact the state government, and the complaint was resolved without being submitted to the relevant state government.
- Systemic Issues: Lax management, low service morale, innate inertia, lack of incentives, improper authority, and lack of accountability.

Actions required to strengthen GRM

- Determining Areas Prone to Grievances: Conduct work audits in areas that are likely to experience corruption and/or complaint creation.
- Citizens' awareness: Extensive media coverage in the form of electronic and local, national, and regional media.
- Civil officials' attitudes can be changed by promoting good work, rewarding innovative ideas, and penalising willful negligence.
- CPGRAMS ought to act as a mediator without compromising the principles of federalism.
- A frequent examination of complaints made in print and electronic media must be conducted by all Ministries.

2nd ARC's recommendation:

- Public grievance officers similar to the RTI Act's public information officers.
- Within 30 days, these officers must satisfactorily resolve every grievance petition they receive.
- Failure to comply with the deadline should result in financial penalties.

Conclusion

GRM is an integral component of any administration's machinery. No administration may assert that it is responsive, accountable, or user-friendly without first putting in place a reliable and effective grievance redress system.

3.4   OTT REGULATION IN INDIA

Latest Context:

Provisions of the Information Technology Rules have recently been used to recommend punitive action against an OTT platform by the Digital Publisher Content Grievances Council (2021).

OTT Meaning:
- OTT, or over-the-top, platforms, are companies that provide users with access to movies, TV shows, and other material via the Internet without the use of cable or satellite services.
- The number of OTT viewers in India is currently 43 million, and by the end of 2023, that number is expected to reach 50 million.
- Additionally, there will be a strong drive for fresh content creation due to the growth of mobile broadcasting.
- In Indian regulatory terms, OTT platforms are referred to as "publishers of online curated content" like Hotstar, Netflix etc.
- Online curated content is audio-visual content that is made available to users on demand, including but not limited to through subscription by OTT platforms, such as movies, web series, podcasts, etc.
- "On Demand" Meaning: A system that enables a user to access any electronic content that is transmitted over a computer resource and is selected by the user, at a time of their choice.

Digital Publisher Content Grievances Council:
- **The Internet and Mobile Association of India (IAMAI) established the Digital Publisher Material Grievances Council (DPCGC), an independent self-regulatory body for online curators of content.**
- **IAMAI and the DPCGC members are steadfastly committed to upholding consumers' rights, giving them the information, they need to make wise decisions, and resolving any issues they may have.**
- Under the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, the Ministry of Information & Broadcasting has recognised and registered DPCGC as a Level II Self-Regulatory Body for publishers of online curators of material.
- DPCGC wants to introduce a redress system through the Grievance Redressal Board that will strike a balance between responding to viewer concerns and showcasing content in a free-speech atmosphere without ad hoc interference.

Current system for OTT regulation in India:

Indian legislation such as the Information Technology Act 2000, the Indian Penal Code, and the Indecent Representation of Women (Prohibition) Act 1986 have been made applicable to the content produced by OTT platforms. Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021 have been developed by the government in accordance with section 87(2) of the Information Technology Act, 2000.

Its main clauses consist of:
- IT Rules 2021 gave the task of regulating content on OTT and online platforms to the Ministry of Information and Broadcasting (I&B).
- Code of Ethics for OTT platforms, online news organisations, and digital media: This Code of Ethics specifies the standards that must be adhered to by these companies.
- Platforms classify their own content into five age-based categories.

U (Universal)	U/A 7+	U/A 13+	U/A 16+	A (Adult)

- Platforms would need to install parental controls for content rated U/A 13+ or above and trustworthy age verification systems for content rated "A."
- Light-touch "co-regulation" model describes India's approach to OTT regulation, which entails "self-regulation" at the industry level and a final "oversight mechanism" at the Ministry level.
- Grievance Redressal Process: In accordance with the regulations, a three-level grievance redressal mechanism with varying levels of self-regulation has been constructed.
  - ✓ Grievance Redressal Officer: The Publisher shall designate an Indian-based Grievance Redressal Officer to be in charge of resolving complaints that it receives.
  - ✓ Publisher Self-Regulatory Body: Publishers may have one or more self-regulatory bodies. A retired Supreme Court judge, a High Court judge, or an independent distinguished person shall preside over such a body, which may not have more than six members.
  - ✓ The Ministry of Information and Broadcasting is responsible for creating an oversight structure. It will set up an Inter-Departmental Committee to handle complaints.

Challenges associated with OTT Regulation:
- Freedom of Expression: Regulating it too strictly could stifle creative freedom and limit artistic expression
- Low compliance: Regulations require that contact information for grievance redressal methods be displayed on OTT websites and interfaces. But compliance rates are extremely poor.
- Privacy and Data Protection: Balancing the need for data protection and user privacy with the requirements of regulation.
- Jurisdictional Issues: Effective enforcement of domestic redressal mechanisms against foreign entities remains a concern.
- Difficult to monitor and ensure compliance: Due to vastness of the digital space, the sheer volume of content being generated, and the rapid pace.

Way Ahead:
- The need for a national broadcasting policy: Distinct broadcasters, such as media broadcasters and OTTs, have different methods, rules, and fees. Consequently, a national broadcasting policy is required.
- Web material is typically more open-minded, addressing issues and ideas that are not typically found in traditional media. As a result, it tends to depart from traditional censoring paradigms and encourages originality and creativity.
- OTT industry organisations could be required to undertake recurring print and electronic media ads about the grievance redressal procedure to raise awareness of the regulations.

- Continual auditing: An independent authority can conduct a monthly audit of the actual availability and effectiveness of access controls, age verification systems, and the display of grievance redressal information by each OTT platform.
- Involve the parties involved: Policymakers and stakeholders should keep working together to create a regulatory framework that is efficient and well-balanced in order to ensure that any substantial bottlenecks, implementation issues, and potential misuse of the regulations are all addressed.

3.5 SHORTS NEWS

3.5.1 AFFIRMATIVE ACTION

- The US Supreme Court prohibited the use of affirmative action in college admissions.
- This major decision has effectively overturned the rulings in Grutter v. Bollinger (2003) and Regents of University of California v. Bakke (1978), which had endorsed the practise.
- Affirmative action, also known as positive action or discrimination, was established in the US to combat ingrained bias against people who identify with particular identities.
  - ✓ It refers to admission procedures intended to boost the representation of Black, Hispanic, and other minority students in US colleges and universities in the context of higher education.
  - ✓ Reservation is an affirmative action programme in India that gives historically underrepresented communities representation in politics, government programmes, government jobs, and educational opportunities.

Parameter	INDIA	US
Purpose	Uplift poorer segments of society who were referred as Scheduled Castes and Tribes.	Ensure equal opportunity for groups that have traditionally faced discrimination due to their race, gender, sexual orientation, or handicap.
Genesis	Under Articles 15(4) and 16(4), introduced as a fundamental right.	The Civil Rights Act of 1964 forbids discrimination on a number of reasons.
Quota	(Indra Sawhney ruling) Fixed at 50% for OBC, SC, and ST in both employment and education	Varies between institutions and states and is not fixed.

3.5.2 GOVERNOR'S POWER

- The Governor of Tamil Nadu turned down the government's proposal to change ministers' portfolios.
- According to Article 164(1), the Governor of Tamil Nadu is responsible for appointing the Chief Minister (CM), and the Governor is responsible for appointing the other Ministers on the CM's recommendation.
- However, the States protest that the Governor's activities violate the idea of federalism because they interfere with their administration.

- The governor is the state's chief executive officer and represents the federal government. He has a number of abilities, including:
    - ✓ Executive: Designating the state's Chief Minister and the council of ministers.
    - ✓ Judicial: In accordance with state laws, commute, remit, or pardon the penalty.
    - ✓ Adopt ordinances as necessary in the legislative branch.

- **Instances of governor's office abuse:**
    - ✓ The purported partisan functioning of the governor is caused by his or her political ties.
    - ✓ No coordination between the appointed Governor and elected government.
    - ✓ Frequently recommending the bills to the President under A-200.
    - ✓ Delaying the state assemblies' adoption of resolutions by not giving assent.
    - ✓ Rejecting the names put forward by the states for various posts.
- Many committees, including the Rajamannar, Punchi, Sarkaria, and Venkatachaliah Commissions, have suggested actions to improve ties between the Governor and the States.

3.4.3 GENERAL CONSENT TO CBI
- Tamil Nadu revoked its general consent given to the CBI for investigating cases within the state.
- The Delhi Special Police Establishment (DSPE) Act of 1946, which governs the Central Bureau of Investigation (CBI), mandates that the investigating body acquire the approval of state governments before it can look into a crime in a certain state.
- The state government may give either general or case-specific consent to CBI.
    - ✓ States often give the CBI their general consent to look into allegations of corruption involving officials from the central government in their states.
    - ✓ Consent is implied by its general consent.
    - ✓ Recently, some States, like West Bengal, Mizoram, Punjab, etc., withdrew their general consent.
    - ✓ CBI would have to apply to the state government in each instance for Case Specific permission.
- The CBI officials will not have the authority of police officers when they enter that state if particular approval is not given.
- For cases in which the inquiry is already underway, withdrawal is not permitted.
- Exceptions to the General Consent:
    - ✓ When SC and HC order CBI to investigate a crime anywhere in the country.
    - ✓ Also when someone has been caught red-handed taking a bribe.

3.4.4 APPOINTMENT OF DGP
- Punjab Police Amendment Bill, 2023 was approved by the Punjab Assembly.
- The law modifies the selection process for the Director General of Police (DGP) and opens the door for the state to nominate the DGP.
- Public order and Police are specified under the State List in the Seventh Schedule of the Constitution, according to the state government.
- Bypassing the necessity of the empanelment by UPSC, the bill altered the Punjab Police Act, 2007.
- It gives the State Government the ability to appoint a DGP by forming a panel of three senior-most officers with a seven-member Empanelment Committee.

Procedure of DGPs Appointment:
- The Supreme Court's ruling on police reforms in Prakash Singh v. Union of India serves as the foundation for DGP appointments (2006).
- According to the ruling, the state government must choose one of the three senior most officers nominated for promotion to the rank of DGP.
- Additionally, it suggested creating establishment boards in each state to control postings and transfers.
- The state submits the names of qualified officials to the UPSC, which appoints a three-member panel (consisting of representatives from the UPSC, the central government, and the respective state government) to choose the candidate for the post.
- According to a 2018 SC order, any legislation or rule that conflicts with the directive for the appointment of posts by the state or federal governments must be put on hold.

3.5.5 JUSTICE CLOCKS
- It is an electronic signage system that has been deployed across the High Courts' court facilities.
- By giving the public a bird's eye view of court-related data, the effort will educate the public and inform stakeholders on important court-related parameters.

3.5.6 NYAYA VIKAS PORTAL
- The Ministry of Law and Justice has developed the Nyaya Vikas Portal to track the execution of Centrally Sponsored Schemes (CSS).

Nyaya Vikas:
- Since 1993–1994, the Department of Justice has been using CSS for the Development of Infrastructure Facilities for Districts and Subordinate Judiciary.
- Construction of courthouses and housing for judicial officers, district judges, etc. is supported centrally by the State Government and UT Administrations.
- Northeastern and Himalayan States receive 90% of the funding; Union Territories get 10% of it, while the other states get the rest (60:40).

3.5.7 PANCHAYAT DEVELOPMENT INDEX (PDI)
- The Panchayati Raj Ministry of the Union released it.
- It offers a grid to track and assess their development based on the marks they receive.
- Panchayats are rated and divided into four grades based on their scores.
- There are four grades: A (75–90 percent), B (60–75 percent), C (40–60 percent), and D (under 40 percent).

4. SECURITY

4.1 ILLEGAL IMMIGRATION THREAT TO OUR INTERNAL SECURITY

Latest Context:
- Refugees from Myanmar who are living in Manipur has made the situation in Manipur more tensed.
- Around 4000 refugees have entered Manipur since 2021 when the Army in Myanmar attacked the people of Kuki-Chin-Zo ethnic group. Kuki-Chin-Zo ethnic group comprises the Lai, TidimZomi, Lusei, and Hualngo tribes. These tribes are closely related to the communities in Mizoram and Manipur.
- Illegal entry of the refugees has posed a risk to our internal security.

Illegal immigration- threat to Internal Security?
- Many North-East militants take shelter in Myanmar to prevent arrest from Indian security agencies. India has a concern that among the people who have come from Myanmar, there might be some militants too who can create more tensions in Manipur, thus risking our national security.
- The route connecting India's North East to Myanmar to South East Asia is known for trafficking of women and human smuggling. Such instability at India's North-East borders might further complicate the situation risking the lives of women and children.
- It increases the financial burden on the government as the government has to spend on the health and education of the refugees. Less resources and more people will prevent the people from using the necessary resources.
- Illegal migration of refugees will increase the community tensions as the native community would feel threatened by the growing number of refugees. These refugees stay for a long period and acquire India's citizenship through fake documents.
- Many of the refuges with the help of fake documents enlist their names in the voting list, acquiring India's citizenship and thus changing the demographics of the region.
- The rising number of migrants pose a threat to the identity of the locals living in the region. For e.g. Assam has seen a change in demography as the ones who were in majority once have been reduced to minority in many regions due to increasing number of migrants.
- The illegal migrants have cut down the forests for settlement and cultivation thus harming the environment and also creating conflict in resource utilization with the local communities.

Reasons for Illegal Migration:
- Harassment of minorities in neighboring countries
- Porous (allows easy passage in & out) border and difficult terrain that are difficult to monitor
- Employment opportunities in India
- Common factors such as- Ethnic, linguistic and religious between illegal migrants and native citizens

Laws in place to tackle illegal migration
- Foreigners Act, 1946: Under the Act, the Central Government can send back illegal foreign nationals.
- Passport (Entry into India) Act, 1920: Under the Act, State Governments has been give the power to remove any illegal foreigner by force.
- The Citizenship Act, 1955: Under the Act, acquisition and determination of Indian citizenship is provided.

Way forward:
- India need to have a concrete refugee policy to deal with the illegal migrants effectively.
- Border fencing should be taken on priority and fencing should be done at every point so as to prevent the people from crossing the border illegally.
- Technology should be leveraged to make sure illegal border crossing be stopped.
- India has to diplomatically exert pressure on our neighboring countries to take back the refugees and ensure that they are not forced to leave their country.
- A unique identity card should be given to the people living in border areas who frequently cross the border for different activities.
- Regional forums like BIMSTEC should be used to discuss solutions for illegal migration.
- The Central Armed Police Forces should be further strengthened along with the state police to effectively deal with the illegal migrants.

4.2   WAGNER GROUP

Latest Context:
- Wagner Group, a Private Military Company led a rebellion against the Russian President Putin.

Wagner Group:
- This group is controlled indirectly by the Russian military and intelligence wing and this group gets weapons and military facilities for training from the Russian military.
- It was known to the people in 2014 when they supported the Russian separatist forces in eastern Ukraine. In the ongoing Russia-Ukraine war, this group played a key role in Russia's capture of Bakhmut city (Ukraine).
- They have led their operations in conflict areas like African and Arab countries.
- Western countries and UN experts have blamed the group for violating human rights. They have also designated the group as a transnational criminal organization.

Private Military Company
- Private Military Company provides military and security services on a contractual basis.
- They operate independent of the government and its military wing. Such companies are usually hired by governments, corporations, international organizations, or individuals to carry out specific tasks, often in conflict zones or areas with security risks.

Other such Private Military Companies (PMC):
- Blackwater/Academi in Iraq- This PMC was contracted by the United States government to provide security services during the Iraq War in 2007.

- Executive Outcomes is a South African PMC- This PMC was hired by the Angolan government operated in Angola in the 1990s during the civil war.
- Sandline International is a British PMC- In late 1990s, this PMC was involved in Papua New Guinea.

Reasons behind the rise in Private Military Companies:
- PMC help the government's security efforts in terms of cost -effectiveness, flexibility, and also the desire to maintain a smaller standing military.
- PMC are often hired for risky and controversial operations, which the state soldiers can deny doing so. E.g. they have been hired to fight against sea pirates and poachers in Africa.
- Technological Advancements- Sophisticated weapons systems, Surveillance equipment and communication tools have made it easier for private armies to operate on a global scale.
- PMC can be given the task to provide military training, advisory support, or security assistance to governments or rebel groups aligned with certain geopolitical interests.
- As there is no clear international regulations and oversight regarding the activities of private armies, it has helped them to operate in a legal grey areas.

Issues with PMCs:
- As there is no legal framework to regulate the activities of PMCs, this can lead to impunity for human rights abuses, misconduct, or violations of international humanitarian law.
- PMCs can potentially undermine the authority of the State by providing security services in conflict zones which is the job of the State.
- As making profits is the objective of the companies, this can lead to compromising the impartiality, integrity, and effectiveness of the services which can put the security of the country at risk.
- There can be social and economic implications for local communities such as displacement, resource exploitation, or socio-cultural tensions due to the presence of PMCs in conflict or post-conflict settings

International Laws and their applicability to PMCs:
- International human rights treaties provide for individual petitions and reporting systems referred to by the states to protect citizens from human rights violations by local or foreign PMCs.
- International Criminal Court (ICC): If a state party refused to investigate an employee of a PMC suspected of war crimes and registered within its jurisdiction, the ICC could initiate its own investigation.
- As per International Law Commission's Articles on State Responsibility (2001), states are responsible for the activities of non-state actors working on behalf of the state. However, state responsibility only extends to other states and not to individuals.
- International Humanitarian Law (IHL) provides clear rules on the combat status of individual employees of PMCs. This applies only in cases of international and civil conflict.
- The International Convention against the Recruitment, Use, Financing and Training of Mercenaries (1989) requires that states parties have an obligation to adopt the provisions of the Convention in national laws. However, the treaty's definition of mercenary is not clear and only few states have ratified it.

4.3 SHORT NEWS

4.3.1 SIPRI YEARBOOK 2023

Latest Context

By the end of the decade, according to the **Stockholm International Peace Research Institute's (SIPRI) Yearbook 2023**, China may have as many intercontinental ballistic missiles (ICBMs) as the United States or Russia.

- **The US has the most nuclear arsenals deployed, followed by France, Russia, and China, while Russia** has the most nuclear arsenals that are stored.

What Does SIPRI Say About Nuclear Arsenals?

International Nuclear Arsenals:
1. **Modernization and Expansion:**
   o In 2022, new nuclear-armed or nuclear-capable weapon systems will be deployed by the nine nuclear-armed powers, which also include **China, Russia, and the United States**.
   o The **United Kingdom, France, India, Pakistan, North Korea, and Israel** are further nuclear-armed nations.
2. **Total Global Inventory:**
   o There are believed to be 12,512 warheads in existence worldwide as of January 2023, with around 9,576 of those maintained in military stocks for possible deployment.

Dominance of Russia and U.S.:
1. **90% of all nuclear weapons:**
   o Nearly 90% of all nuclear weapons are in the hands of Russia and the United States, and their respective nuclear arsenals have remained largely steady in size.
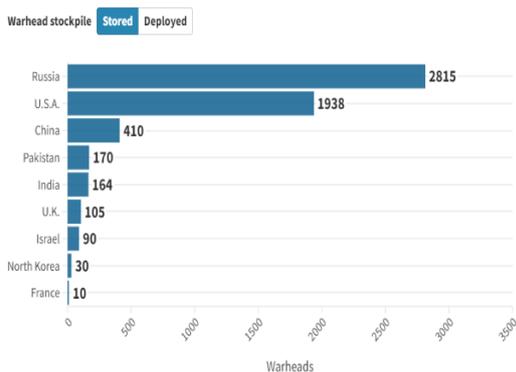2. **Arms Control Concerns:**
   o Following Russia's invasion of Ukraine, communication and transparency on nuclear weapons decreased between Russia and the United States.
   o Discussions towards a follow-on pact have come to an end due to the suspension of the strategic stability dialogue and the pact on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START).
3. **New START Limits Maintained:**
   o According to SIPRI's estimate, despite the tense ties, both Russia and the United States have their deployed strategic nuclear forces inside the New START limitations as of January 2023.
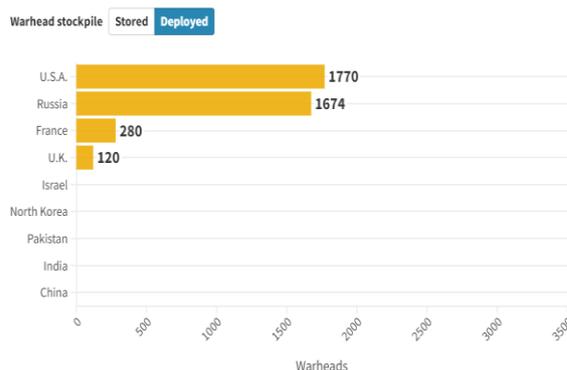

Stockpile count
The nine nuclear-armed states have deployed or stored 9,576 nuclear warheads (as of January 2023)

Warhead stockpile [Stored] Deployed

	Warheads
Russia	2815
U.S.A.	1938
China	410
Pakistan	170
India	164
U.K.	105
Israel	90
North Korea	30
France	10

Stockpile count
The nine nuclear-armed states have deployed or stored 9,576 nuclear warheads (as of January 2023)

Warhead stockpile Stored [Deployed]

	Warheads
U.S.A.	1770
Russia	1674
France	280
U.K.	120
Israel	
North Korea	
Pakistan	
India	
China	

India's Nuclear Arsenal:

1. **Growth in Arsenal:**
   o In the same era, Pakistan's nuclear arsenal increased from 165 to 170 warheads while India's nuclear arsenal went from 160 to 164 weapons.

2. **Focus on Longer-Range Weapons:**
   o While largely targeted against Pakistan, India's nuclear deterrence is increasingly emphasising longer-range missiles that may reach targets throughout China.

3. **Upgrading Ballistic Missiles:**
   o India is modernising its ballistic missile arsenal with the creation of a submarine-launched intermediate-range ballistic missile and the impending introduction of the 'Agni Prime', a new generation ballistic missile.

China's Nuclear Arsenal:

1. **Increased Size:**
   o According to the SIPRI, China's nuclear arsenal increased from 350 warheads in January 2022 to 410 warheads in January 2023.

2. **Concerns About Expansion:**
   o The considerable increase in China's nuclear arsenal is cause for concern since it goes against the country's professed intention to keep only the necessary number of nuclear weapons for national security.

What is SIPRI?

- The **SIPRI** is an independent, global research organisation that conducts studies on weapons, disarmament, and arms control.
- **Established in Stockholm in 1966,** SIPRI offers decision-makers, scholars, the media, and the general public data, analysis, and recommendations based on open sources.

4.3.2   TAPAS UNMANNED AERIAL VEHICLE (UAV)

- DRDO and Indian Navy have successfully carried out **control capabilities** of **TAPAS** (Tactical Airborne Platform for Aerial Surveillance) UAV **from a distant ground station to onboard INS Subhadra**.
- TAPAS 201 is an indigenously developed **Medium Altitude Long Endurance (MALE) UAV**.
- Bengaluru-based Aeronautical Development Establishment (ADE) has designed and developed this UAV. TAPAS is capable to carry **different combinations of payloads** such as **Medium Range Electro Optic, Long Range Electro Optic, Synthetic Aperture Radar** etc. in order to perform missions during day and night.
- It has a capacity of more than 18 hours and can operate at altitudes of up to 28,000 feet. It can carry payloads of up to **350 kg**.

4.3.3   BRIAN ELECTRICAL OSCILLATION SIGNATURE PROFILING (BEOSP)

- BEOSP which is also known as **Brain Fingerprinting/Brain mapping/ P-300 test**, is a neuropsychological method of interrogation. It is devised to draw the information which is hidden in the brain of a person by sensing brain wave responses respective to words, phrases, or pictures presented.
- This test is carried out through a process known as an **electroencephalogram** that has been conducted to study the electrical behaviour of the human brain.

o **Difference between polygraph test and BESOP**

Polygraph	Brain Mapping
• Polygraph test involves a question-answer session with accused	• In this test, there is no question-answer session-like mechanism in order to know the correct information from the accused,
• In a polygraph test, the accused person's physiological indicators are taken into account which include blood pressure, pulse rate, respiration and skin conductivity	• Brain mapping is considered much more credible than a polygraph test because Brain-mapping is a comprehensive analysis of brainwave frequency bandwidths. In this test, forensic experts apply unique neuroscience techniques to find out if a suspect's brain recognises things from a crime scene that an innocent person's brain will have no knowledge of.

- **Applications of Brain fingerprinting**
  o To know the accused's participation in a crime.
  o Medical diagnosis and treatment of Neurological diseases like Alzheimer.
  o Counter Terrorism by probing the possibility of a terrorist act by an individual.
  o In the Selvi versus State of Karnataka case (2010), SC stated that narco analysis, polygraph and brain mapping tests cannot be forced upon any individual without their consent and the test results obtained by employing these methods cannot be considered as sole evidence.

4.3.4 EXERCISE IN NEWS

- **Exercise Ekatha**: This is an exercise that is conducted between the navies **of India and Maldives** annually.
- **EKUVERIN**: It is a joint military exercise between **Indian Army and Maldives National Defence Force**.
- **Ex Khaan Quest 2023**: Indian Army participated in **Ex Khaan Quest** (**Mongolia**) which is a multinational peacekeeping joint exercise

4.3.5 VARUNASTRA

- Recently, the **indigenously developed heavyweight torpedo 'Varunastra'** was successfully test fired.
- This torpedo was designed by the **Naval Science and Technological Laboratory (NSTL),** which comes under the **Defence Research and Development Organisation (DRDO)** and it is manufactured by **Bharat Dynamics Ltd (BDL).**
- Basically, a **torpedo is a self-propelled underwater weapon** which is designed to target and destroy enemy vessels or submarines.
- Torpedo is **typically cylindrical in shape** and equipped with explosives, propulsion systems, and guidance mechanisms.
- Varunastra has many modern features such as **low drift navigational systems, autonomous guidance algorithms and others.**
- During the test, it **has shown some remarkable capabilities** by **accurately hitting an undersea target.**

- **It will replace the older models** currently equipped on naval ships.
- It has a **maximum speed of 40 knots and can work till the depth of 600 meters.**
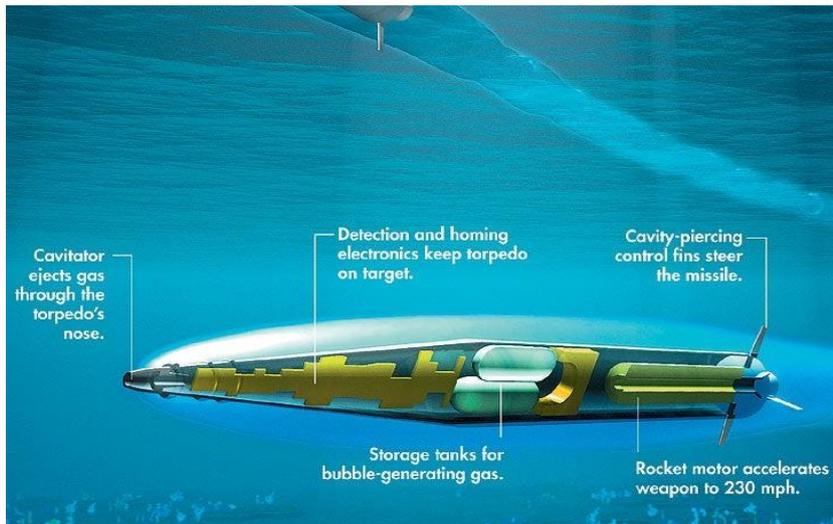
4.3.6   AGNI PRIME OR AGNI-P

- Recently, the new generation ballistic missile **'Agni Prime'** was successfully **flight-tested by Defence Research and Development Organisation (DRDO).**
- Basically, the **Agni-P is a 2-stage canisterised (reduces the launch time) solid propellant ballistic missile** with dual navigation and guidance system.
- It's **range** is in **between 1000 to 2000 kms.**
- It is lighter than all the earlier Agni series of missiles.
- **Agni missile system forms the backbone of India's nuclear deterrence**
- **Agni-1 to 5**, which are **surface to surface ballistic missiles** are designed & developed by **DRDO.**

5. SCIENCE & TECHNOLOGY

5.1 NEW TREATY FOR OUTER SPACE

Latest Context

In a recent policy brief **titled "For All Humanity — The Future of Outer Space Governance,"** the United Nations (UN) suggested the creation of a new treaty to guarantee peace, security, and the avoidance of an arms race in space.

- The suggestions coincide with the impending **UN Summit of the Future**, which is slated to take place in New York in September 2024. In order to address upcoming difficulties, the summit intends to enable multilateral solutions and enhance global governance.

Key Highlights of the new Treaty

Rising Satellite Launches:
- **Over the past ten years**, satellite launches have grown exponentially as a result of involvement from both the public and private sectors.
- The number of new launches climbed from 210 in 2013 to 600 in 2019, 1,200 in 2020, and 2,470 in 2022.
- Leading countries in space operations, including as manned missions, lunar exploration, and resource exploitation, include the **United States, China, India, and Japan.**
- **The National Aeronautics and Space Administration (NASA)** aims to send the first woman and the next man to the Moon with its Artemis mission.
- **Minerals on the Moon (which has vast reserves of helium 3, which is rare on Earth), asteroids (which have large concentrations of priceless metals, including as platinum, nickel, and cobalt)**, and planets can be attractive to nations.

Lack of a global Framework:
- On the exploration, exploitation, and use of space resources, there is no established international framework.
- In addition to addressing questions of jurisdiction, control, accountability, and responsibility for environmental damage, the brief emphasises the significance of setting up structures to facilitate the execution of space resource operations.

Coordination and Traffic Management in Space:
- With several national and regional organisations using different standards and practises, the coordination of space traffic is currently fragmented.
- Countries with limited space capabilities face difficulties as a result of the lack of cooperation.

Environmental issues and Space Debris:
- Various objects that pose risks to operational spacecraft are part of the important issue of the spread of space debris.
- The UN demands legal analysis of jurisdiction, control, accountability, and responsibility for space debris's impact on the environment. Technology to clear space debris is being developed, but legal considerations must be made.

Recommendations of the New Treaty

Peace and Security for New Treaty:
- To maintain peace, security, and the avoidance of an arms race in space, the UN recommends that a new convention be negotiated and developed.
- With the help of this treaty, responsible space operations would be encouraged and new concerns would be addressed.

Situational Awareness in Coordinated Space:
- The establishment of an efficient framework for coordinating space situational awareness, space object manoeuvres, and space events is encouraged by member states. The safety and security of space activities will be improved by this collaboration.

Framework for Space Debris Removal:
- The UN requests that standards and guidelines for removing space debris be developed while taking into account legal and scientific considerations.
- It is advised to develop an efficient framework for the exploration, exploitation, and use of space resources, particularly those found on the Moon and other celestial bodies.

Facts about Outer Space
- The vast area between celestial bodies and outside the Earth's atmosphere is referred to as **outer space**, sometimes known as space or celestial space. Beyond the atmosphere of the Earth, and across the entirety of the cosmos, lies a vacuum. Extremely low pressure and density, as well as the lack of air and other atmospheric components, are characteristics of outer space.

UN Treaties:
- **The "five United Nations treaties on outer space" are**:
  1. **Rescue Agreement 1968**: Agreement on Astronaut Rescue, Astronaut Return, and the Return of Launched Objects to Space.
  2. **Moon Agreement 1979:** Agreement Regulating States' Activities on the Moon and Other Celestial Bodies.

3. **Liability Convention 1972:** Convention on International Liability for Damage Caused by Space Objects.
4. **Registration Convention 1976:** Convention on Registration of Objects Launched into Outer Space.
5. **Outer Space Treaty 1967:** Treaty on Principles Governing International Space Activities, including the Exploration and Use of the Moon and Other Celestial Bodies.

- **India has ratified just four of these five accords, although being a signatory to all five. India refused to ratify the Moon accord**.

5.2 COMPLETE BAN OVER 14 FIXED DOSE COMBINATION (FDC) DRUGS

Latest Context:
Recently, the Ministry of Health and Family Welfare prohibited the manufacture, sale or distribution of 14 fixed-dose combination medicines.

More about the news:
- This decision was taken after an expert committee recommended that **"there is no efficiency in these FDCs and they may involve risk to human beings".**
- The banned FDC includes drugs such as **Nimesulide + Paracetamol dispersible tablet, and Amoxicillin + Bromhexine, etc.**

About Fixed Dose Combinations (FDCs)
- FDC refers to a **pharmaceutical product that contains two or more active ingredients in fixed, pre-determined doses within a single dosage form, such as a tablet, capsule, or syrup.**
- These active ingredients may be from the same or different therapeutic classes.
- The **purpose of FDCs is to combine the therapeutic effects of multiple drugs into a single dosage,** making it more convenient for patients to take multiple medications at once.

Advantages of Fixed Dose Combinations are:
- **Simplified Dosage:** FDCs reduce the number of tablets or medications a patient needs to take, improving medication and reducing the risk of missed doses.
- **Synergistic Effects:** In some cases, combining multiple drugs in a fixed dose can lead to high effects, where the combined action is more potent or effective than individual drugs alone.
- **Improved Efficacy:** FDCs can be designed to target multiple aspects of a disease or condition simultaneously, leading to better treatment outcomes.
- **Reduced Side Effects:** By combining drugs that work through different mechanisms, FDCs can sometimes lower the individual doses of each drug, potentially reducing side effects.
- **Cost-Effectiveness:** FDCs may be more cost-effective than purchasing individual drugs separately, as they reduce packaging and distribution costs.

Disadvantages of Fixed Dose Combinations are:
- **Limited Individualization:** FDCs contain fixed doses of multiple drugs, which may not be suitable for all patients. Individual variations in patient response and tolerance to medications cannot be adjusted with fixed combinations.

- **Drug Interactions:** Some FDCs may include drugs that interact adversely with each other, leading to reduced efficacy or increased risk of side effects. It can be challenging to adjust doses or remove one component in case of drug interactions.
- **Difficulty in Titration:** Titration, the process of adjusting drug doses to find the most effective and tolerable level, becomes more challenging with FDCs. Individual drugs in the combination may need different titration schedules.
- **Regulatory Approval:** Developing and obtaining regulatory approval for FDCs can be more complex and time-consuming compared to individual drugs, as it requires comprehensive safety and efficacy data for the combination.
- **Limited Availability:** Not all medications are available in FDC form, and their availability may vary by region or country. This limitation can affect the accessibility of certain essential drugs.
- **Potential for Unnecessary Medication:** In some cases, patients may receive FDCs containing medications they do not need, leading to unnecessary exposure to certain drugs.
- **Difficulty in Identifying the Causative Agent:** In case of adverse reactions, identifying the specific drug responsible for the side effect can be challenging when multiple drugs are combined in an FDC.

How Fixed Dose Combination drugs are regulated in India?

- **Approval of FDCs:** Before a pharmaceutical company can manufacture and market an FDC drug in India, it needs to obtain approval from the CDSCO. The company must submit a detailed application, including data on the safety, efficacy, and quality of the FDC, along with any relevant clinical trial data.
- **Expert Committee Review:** The CDSCO appoints an expert committee to review the application for the FDC drug. The committee evaluates the scientific evidence presented by the company and assesses whether the combination of drugs in the fixed dose is justified and safe for use.
- **Safety and Efficacy Evaluation:** The expert committee evaluates the safety and efficacy data to ensure that the FDC provides therapeutic benefits without an undue risk of adverse effects. The committee also examines, whether the FDC offers any advantages over individual drugs or existing treatment options.
- **Rationality and Justification:** The CDSCO scrutinizes the rationale and justification for combining the specific drugs in the FDC, considering factors such as synergy between the drugs, enhanced patient compliance, and improved treatment outcomes.
- **Marketing Approval:** If the expert committee is satisfied with the data and recommends the approval of the FDC, the CDSCO grants marketing approval, and the FDC drug can be manufactured and marketed in India.
- **Post-Marketing Surveillance:** Even after approval, the CDSCO continues to monitor the safety and efficacy of FDC drugs through post-marketing surveillance. Adverse drug reactions and any concerns related to FDCs are reported and investigated to ensure patient safety.

Conclusion

In recent years, the **regulation of FDC drugs in India has become more stringent due to concerns about the irrational combinations of drugs and potential risks to patient health.** The CDSCO has taken measures to ensure that FDCs meet scientific and regulatory standards and are only approved when they offer clear therapeutic benefits with acceptable safety profiles.

5.3 NATIONAL SICKLE CELL ANAEMIA ELIMINATION MISSION

Latest Context:

Recently, the PM launched the 'National Sickle Cell Anaemia Elimination Mission' with the target to eradicate the disease by 2047.

Sickle Cell Anaemia

- It's a **genetic blood disorder** characterized by the **presence of abnormal haemoglobin molecules in red blood cells.** Haemoglobin is a protein responsible for carrying oxygen throughout the body.
- Sickle cell anaemia is **an inherited disorder**, meaning it is passed down from parents to their children. It is more common in individuals of African, Mediterranean, Middle Eastern, and Indian descent. To be born with sickle cell anaemia, a person must inherit the sickle cell gene from both parents.
- In individuals with sickle cell anaemia, a mutation in the gene that codes for haemoglobin causes the production of abnormal haemoglobin known as **'Haemoglobin S'.**
- This abnormal haemoglobin S causes red blood cells to become misshapen and rigid, taking on a crescent or sickle shape instead of the normal round shape. These sickled red blood cells are prone to clumping together, leading to the formation of clots and blockages in the blood vessels. This can cause reduced blood flow to various organs and tissues, resulting in severe pain and damage to organs.
- **In India, it is more common in the tribal population but occurs in non-tribals too.**

Symptoms are:

- Symptoms of sickle cell anaemia can vary from person to person and can range from mild to severe.
- Some common symptoms include chronic fatigue, pale skin, shortness of breath, delayed growth and development in children, episodes of severe pain known as 'pain crisis', increased susceptibility to infections, and organ damage.

About the Treatment

- The treatment for sickle cell anaemia focuses on **managing symptoms, preventing complications, and improving quality of life.**
- This may involve medications to alleviate pain, prevent infections, or manage complications such as anaemia.
- **Regular monitoring, blood transfusions and bone marrow or stem cell transplants** may also be part of the treatment plan for some individuals.

What is Sickle Cell Disease (SCD)?
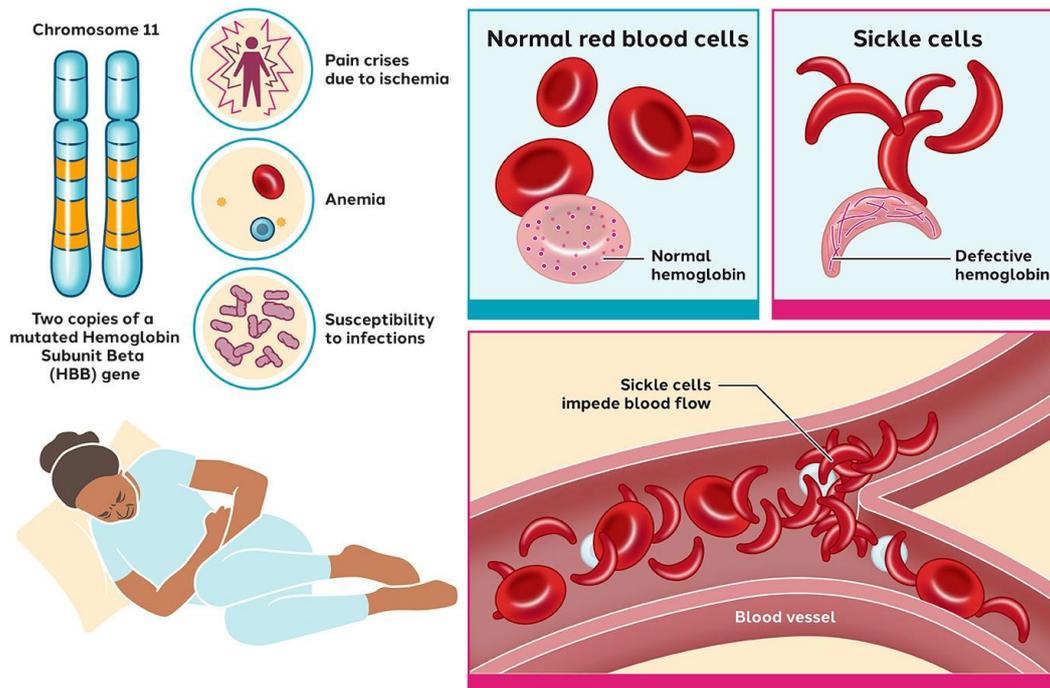
About the mission:
- The main objective of the mission is to **provide affordable and accessible care** to all Sickle Cell Disease (SCD) patients.
- Overall vision of the mission is to **eliminate SCD as a public health problem in India before the year 2047.**
- The mission will be carried out in a mission mode and **will focus on 3-pillar strategy:**
  1. **Health promotion:** The focus will be on awareness generation & pre-marital genetic counselling.
  2. **Prevention:** Universal screening and early detection will be prioritized.
  3. **Holistic Management**: To eliminate this disease by 2047, focus will be given on holistic management and the research which can increase our understanding regarding this disease.
- **Initially, the focus will be on 17 states with higher prevalence of SCD** including Gujarat, Maharashtra, Rajasthan, MP, Jharkhand, Chhattisgarh, West Bengal, Karnataka, Assam, UP, Kerala, Bihar, Uttarakhand etc.

Challenges in controlling Sickle Cell Anaemia (SCA) are:
- **Genetic Basis:** SCA is caused by a genetic mutation, and individuals with the condition inherit two abnormal haemoglobin genes (one from each parent). Since it is a hereditary disorder, preventing its occurrence entirely requires addressing the genetic component.
- **Limited Treatment Options:** Although there have been some advancements in managing SCA, there is no cure for the condition. Treatment primarily focuses on symptom management, pain relief during crises, and preventing complications. Developing effective curative treatments remains a significant challenge.
- **Lack of Awareness:** There is often limited awareness and understanding of sickle cell anaemia among the general public and even healthcare professionals. This can lead to delayed diagnoses and inadequate management of the condition.
- **Access to Healthcare:** In some regions, especially in low-income countries, access to quality healthcare and specialized treatment for sickle cell anaemia may be limited. This can result in suboptimal care and outcomes for affected individuals.

- **Complications and Comorbidities:** SCA can lead to various complications, such as organ damage, stroke, acute chest syndrome, and infections. Managing these complications and addressing comorbidities can be complex.
- **Psychological and Social Impact:** Living with a chronic condition like sickle cell anaemia can have a significant psychological and social impact on affected individuals and their families.
- **Research and Funding:** While progress has been made in understanding the pathophysiology of sickle cell anaemia, more research is needed to develop novel treatments and improve the quality of life for affected individuals. Funding for research and clinical trials can be limited compared to other diseases.
- **Stigma:** Stigma associated with sickle cell anaemia may exist in some communities, leading to reluctance to seek medical care or hindering efforts to raise awareness about the condition.

Initiatives taken by Indian government to tackle Sickle-Cell Anaemia are:
- **National Sickle Cell Anemia Control Program (NSCAP):** The Ministry of Health and Family Welfare launched the NSCAP in 2010. This program aims to prevent and control sickle cell anaemia through early detection, treatment, counselling and awareness programs. It focuses on providing screening services, genetic counselling, and comprehensive healthcare for affected individuals.
- **Screening and Diagnostic Services:** The government has established screening programs in regions with a high prevalence of sickle cell anaemia, particularly among tribal populations. These programs involve conducting blood tests to identify individuals with the sickle cell trait or sickle cell anaemia. Early identification helps in providing appropriate medical care and counselling.
- **Treatment and Management:** The government has focused on improving access to healthcare services and treatment for individuals with sickle cell anaemia. This includes providing free or subsidized medications such as 'hydroxyurea', which can help reduce complications and improve quality of life. Regular monitoring, blood transfusions, and other supportive therapies are also provided to manage the condition effectively.
- **Awareness and Education:** The government has conducted awareness campaigns to educate individuals, families, and communities about sickle cell anaemia. These campaigns aim to increase understanding about the condition, its inheritance pattern, the importance of genetic counselling and the available treatment options. Educational materials, workshops, and community outreach programs are used to disseminate information.
- **Capacity Building:** The government has focused on building the capacity of healthcare providers to effectively manage sickle cell anaemia. This includes training healthcare professionals on the diagnosis, treatment, and management of the condition. Capacity building efforts also extend to providing specialized care in hospitals and healthcare centers.
- **Research and Collaboration:** The Indian government has encouraged research initiatives to better understand sickle cell anaemia and develop improved treatment strategies. Collaboration with national and international organizations, research institutes, and universities has been promoted to advance knowledge and find innovative solutions.

5.4 LAB GROWN DIAMONDS

Latest Context:
Recently during his state visit to USA, PM Modi gifted a 7.5 carat eco-friendly lab grown diamond to the first lady of the USA.

What are Lab Grown Diamonds?
- Lab-grown diamonds, **also known as synthetic diamonds or cultured diamonds, are diamonds that are produced in a controlled laboratory environment** rather than being formed naturally in the Earth's crust over billions of years.
- These diamonds **have the same chemical composition, physical properties, and optical characteristics as natural diamonds,** but they are created through a process called **Chemical Vapor Deposition (CVD) or High Pressure, High-Temperature (HPHT) methods.**
- India produces over **3 million** lab-grown diamonds (15 % of global production).
- **India is the largest producer of lab grown diamonds** through the CVD technology and contributes to nearly **25%** of global production.
- The government has introduced various measures to promote the growth of lab-grown diamonds, including the elimination of the **5 percent** tax on LGDs.
- Additionally, government had announced to **establish the India Centre for Lab-grown Diamond at IIT Madras.**

The two primary methods of creating lab-grown diamonds are:
- **Chemical Vapor Deposition (CVD):** In this method, a diamond seed (a small diamond) is placed in a vacuum chamber, and a carbon-rich gas (usually methane) is introduced. The gas is then ionized, and carbon atoms are deposited onto the diamond seed, layer by layer, creating a larger diamond over time.
- **High Pressure, High Temperature (HPHT):** In this process, a small diamond seed is placed in a pressure chamber and subjected to high pressure and high temperature. A carbon source, often a metal solvent with graphite, is added to the chamber. The combination of high pressure and temperature causes the carbon atoms to crystallize around the diamond seed, resulting in the growth of a larger diamond.

Cultured Diamonds	Natural Diamonds
They are lab-grown, mostly inside a reactor, treated to extreme heat, pressure and gases	Natural diamonds were created millions of years ago out of carbon deposits, at a depth of over 150 kms into the earth's mantle
PRODUCTION TIME 5-15 days	FORMATION TIME More than a million years
Chemical & physical properties: Same as natural diamonds	A mineral composed of carbon; hard and adamantine
PRICE: 30-35% cheaper than mined diamonds	Very expensive. 1 Carat solitaire priced upwards of ₹3 lakh
QUALITY: Flawless diamonds can me made in large numbers under lab condition. Less inclusions	Flawless diamonds are rare - and expensive. High level of inclusions in lower-grade diamonds
Lab-grown diamonds are conflict-free diamonds	Diamonds are still smuggled out of conflict zones in Africa. These are popularly known as blood diamonds
Less environmentally polluting	Depth mining is not environment-friendly
Resale value is very low in cultured diamonds	Natural diamonds have a better resale value.

What are the uses of Lab Grown Diamonds?

- **Jewellery:** Lab-grown diamonds are commonly used in jewelleries, including engagement rings, earrings, necklaces, bracelets, and more. They are chemically and optically identical to natural diamonds, making them an attractive choice for consumers who want genuine diamonds without the ethical and environmental concerns associated with mining.

- **Industrial Applications:** Lab-grown diamonds have excellent physical properties, including hardness and thermal conductivity, which make them valuable for various industrial purposes. They are used as abrasives in cutting and grinding tools for applications like stone cutting, drilling, and machining hard materials. They are also used in precision cutting and polishing in the electronics and automotive industries.

- **Research and Science:** Lab-grown diamonds are used in scientific research and experimentation due to their unique properties. They are utilized in high-pressure experiments, quantum optics etc.

- **Medical Equipment:** Synthetic diamonds are used in medical equipments, particularly in laser technology and surgical instruments. Their high thermal conductivity and optical properties make them valuable for creating high-power lasers used in medical procedures, such as eye surgeries and dental treatments.

- **Electronics:** Lab-grown diamonds are used in the electronics industry as heat sinks for electronic components. They can efficiently dissipate heat from electronic devices, improving their performance and longevity.


5.5   BRAIN-COMPUTER INTERFACE

About Brain–Computer Interface (BCI)

- BCI, also known as a **Brain-Machine Interface (BMI),** is a **technology that establishes a direct communication pathway between the human brain and an external device**, such as a computer or a robotic system.

- BCIs **enable individuals to control and interact with these devices using only their brain signals,** without the need for any muscle movement or physical input.

- The main goal of BCI is to **assist individuals with various disabilities** such as paralysis, in restoring their communication and control abilities.

- Additionally, BCI have the **potential to increase human capabilities**, allowing users to interact with technology in new and unique ways, or even control external devices seamlessly through their thoughts.

There are different types of BCIs, but most of them fall into two categories:

- **Invasive BCIs:** These interfaces require surgical implantation of electrodes or sensors directly into the brain tissue. The advantage of invasive BCIs is that they can provide
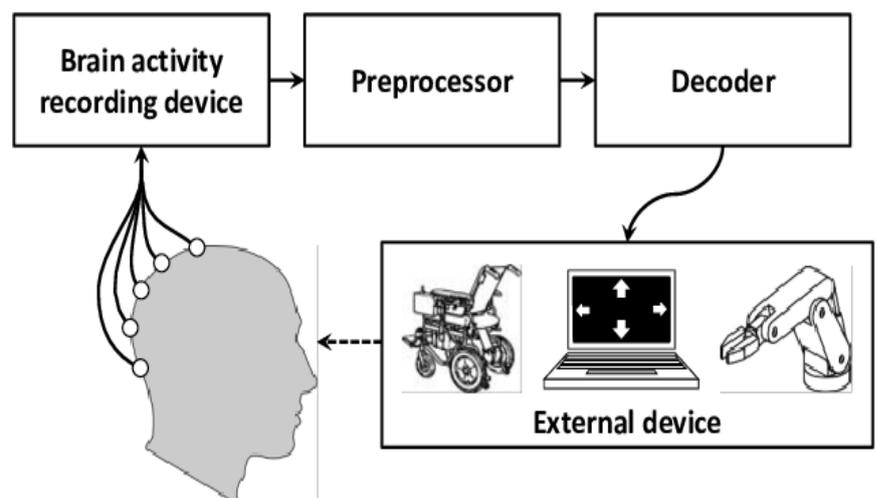
high-quality and precise brain signals, making them suitable for tasks that require high quality control.

- **Non-invasive BCIs:** These interfaces do not require any surgical implantation and instead record brain signals through external methods, such as Electroencephalography (EEG), functional Magnetic Resonance Imaging (fMRI), Magnetoencephalography (MEG), or Near-infrared Spectroscopy (NIRS). Non-invasive BCIs are safer but often provide lower-quality signals compared to invasive methods.

BCIs involve several stages like:

- **Signal Acquisition:** Brain activity is recorded through electrodes or sensors placed on or inside the scalp (for non-invasive BCIs) or directly on the brain surface (for invasive BCIs).
- **Signal Processing:** The recorded brain signals are processed to extract relevant features and convert them into meaningful control commands.
- **Decoding:** A BCI system interprets the processed brain signals to determine the user's intent or desired action, such as moving a cursor, typing on a virtual keyboard, or controlling a robotic limb.
- **Output:** The decoded commands are then used to control external devices, such as computers, assistive devices, or robotic systems.

Applications of BCI can be:

- **Assistive Technology:** BCIs can assist individuals with severe disabilities by enabling them to control external devices such as computers, wheelchairs, or robotic arms using their brain signals. This application can significantly improve their quality of life and independence.
- **Communication:** BCIs can restore communication abilities for people with conditions that prevent them from speaking. By translating brain signals into text or speech, BCIs can help individuals express their thoughts and interact with others.
- **Entertainment and Gaming:** BCIs can be used to create interactive gaming experiences. Players can control characters or elements in the game using their thoughts, enhancing the gaming experience.
- **Healthcare and Monitoring:** BCIs can be used for continuous monitoring of brain activity in medical settings to detect abnormalities.
- **Driving Assistance:** BCIs can be used in vehicles to detect the driver's mind and to provide assistance or intervene if the driver's attention level drops below a safe threshold.

Concerns related to BCI

- **Privacy and Security:** BCIs involve the direct access and interpretation of brain signals, which are highly personal and sensitive data. Protecting this data from unauthorized access, hacking, or misuse is a significant concern.
- **Informed Consent:** As BCIs involve direct interactions with the brain, obtaining informed consent from users becomes more complex. Users must fully understand the risks and potential consequences of using BCIs, including possible side effects or unforeseen long-term impacts.
- **Reliability and Accuracy:** BCIs heavily rely on accurate signal processing and decoding algorithms. Inaccurate readings or misinterpretation of brain signals could lead to unintended actions or outcomes.
- **Ethical Use and Control:** BCIs have the potential to change the way humans interact with technology and even alter our behaviour. Ensuring that BCIs are used ethically

and responsibly is crucial to avoid unintended consequences or undue influence over users.

- **Addiction and Dependency:** As BCIs become more interactive, there is a risk of addiction or dependency on brain-controlled experiences. Users might prefer BCI-mediated interactions over real-world interactions, potentially leading to social and psychological issues.
- **Long-Term Health Effects:** The long-term effects of interfacing directly with the brain are not yet fully understood. Although many BCIs use non-invasive methods, there may still be unknown risks associated with long-term usage.
- **Inequality and Accessibility:** As with any new technology, there is a risk that BCIs will primarily benefit those who can afford them, creating a divide between those who have access to advanced cognitive technologies and those who do not.

Conclusion

Addressing these concerns **requires a cooperative approach, involving researchers, ethicists, policymakers, and the general public.** Transparency, open dialogue, and responsible development are essential to understand the potential of BCIs, while minimizing their associated risks.

5.6   RARE HIGGS BOSON DECAY

Latest Context:
Recently, scientists at The European Organization for Nuclear Research (CERN) which hosts the Large Hadron Collider (LHC) have discovered evidence of the Higgs boson decaying.
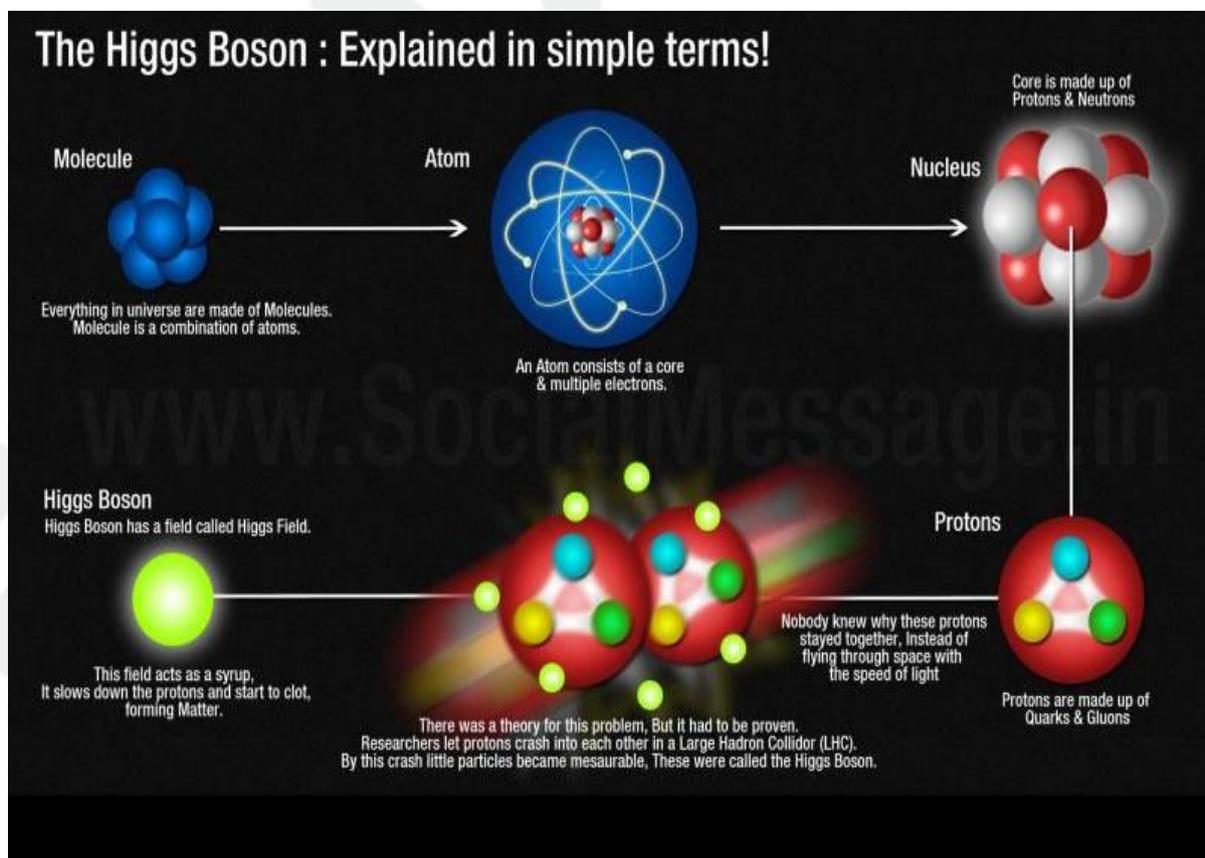
About Higgs Boson

- The Higgs boson is a **fundamental particle in the field of particle physics** and is popularly known as the **"God particle".**
- It was **first experienced in 1960s** by British physicist **Peter Higgs**, along with several other scientists, as a crucial part of explaining how other particles acquire mass.
- According to this theory, **a field called the Higgs field surrounded the entire universe.** As particles move in this field, they interact with it and acquire mass.
- **In 2012, experimental evidence for the existence of the Higgs boson came from the Large Hadron Collider (LHC) at CERN near Geneva, Switzerland.**
- The discovery of the Higgs boson was a significant breakthrough in particle physics. This discovery has confirmed the existence of the Higgs field.
- The **Higgs boson is unstable and quickly decays into other particles after its creation**, making it challenging to observe directly. Scientists study its decay and characteristics to understand its properties and behaviour.

Implications of the discovery

- This recent discovery showing evidence of decay **can provide indirect evidence to the existence of particles,** beyond those understood by the particle physics.
- This discovery **can lead to the discovery of 5th fundamental force,** which is yet to be discovered.
- At present, Physicists recognises 4 fundamental forces namely the **strong force, the weak force, the electromagnetic force and the gravitational force.**

About CERN (the European Organization for Nuclear Research)

- It is **one of the world's largest and most prestigious centers for particle physics research.**
- It was **established in 1954** and is located near **Geneva, Switzerland.**
- CERN operates **a complex of accelerators and detectors** to study the fundamental particles and forces that govern the universe.
- CERN is **famous for its large particle accelerators**. The most prominent among them is the **Large Hadron Collider (LHC),** a circular accelerator that spans a circumference of about 27 kilometers (about 17 miles).
- The **LHC is the world's largest particle accelerator** and is used to collide protons or heavy ions at extremely high energies. These collisions recreate conditions similar to those moments after the Big Bang, allowing scientists to study fundamental particles and interactions.
- CERN is a **collaborative effort, with numerous countries and thousands of scientists from around the world participating in its research programs.** The organization promotes international collaboration and open access to data, leading to a diverse and inclusive scientific community.
- CERN is known for its **'open science policy'.** The research conducted at CERN is typically made available to the public and other researchers, promoting the free exchange of knowledge.

5.7   STEM CELLS

Latest Context:

Recently, a team of scientists in the US has created the first synthetic human embryo-like structures in the world using stem cells without the need of eggs and sperms.
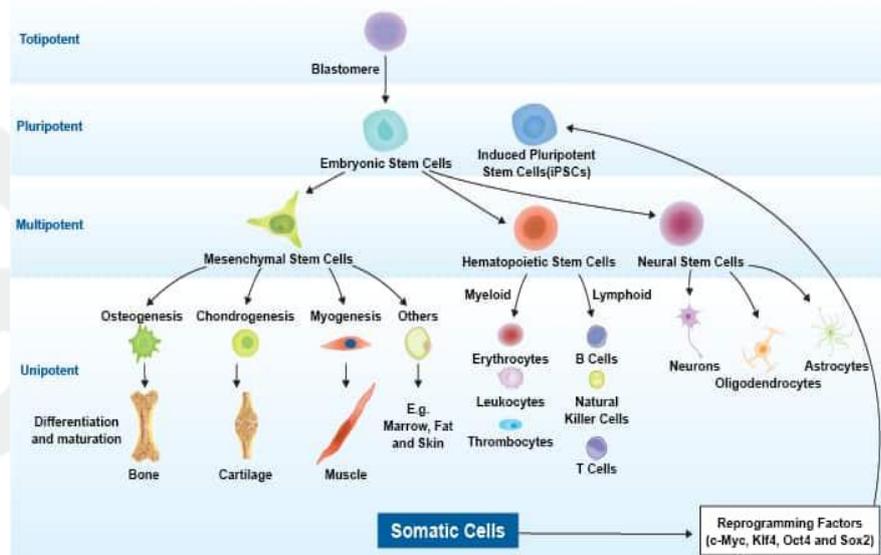
More about the news:
- These **synthetic embryos are just like natural embryos** in the earliest stages of human development.
- **These embryos lack a beating heart or the beginnings of a brain**, but they contain cells that can give rise to the placenta, yolk sac etc.

What are Stem Cells?
- Stem cells are a **unique type of cells found in the body that have the ability to develop into various specialized cell types.**
- They are characterized by two essential features: **self-renewal and differentiation.**
- **Self-renewal:** Stem cells can divide and produce identical copies of themselves, ensuring a continuous supply of stem cells. This property allows them to maintain their numbers and remain undifferentiated.
- **Differentiation:** Stem cells can differentiate into specialized cells with distinct functions, such as nerve cells, muscle cells, blood cells, and more. This process is known as "differentiation," and it enables stem cells to contribute to the formation and repair of different tissues and organs in the body.

There are two main types of stem cells:

- **Embryonic stem cells (ESCs):** These stem cells are derived from embryos during the early stages of development. ESCs are pluripotent, meaning they have the potential to differentiate into any cell type in the human body.
- **Adult or somatic stem cells:** These stem cells are found in various tissues and organs of the body, even in adults. Adult stem cells are multipotent, which means they can differentiate into a limited range of cell types within the tissue or organ they are located in. For instance, Hematopoietic stem cells in the bone marrow can give rise to different types of blood cells.

Relevance of stem cells in biomedical research and therapies can be:
- **Regenerative Medicine:** Stem cells have the ability to differentiate into specialized cell types, making them valuable for regenerating damaged or diseased tissues and organs. Researchers are exploring the use of stem cells to treat conditions like spinal cord injuries, heart diseases, diabetes, and more.

- **Drug Development and Testing:** Stem cells can be used in drug development. By using stem cell-derived tissues, scientists can test the safety and efficacy of potential drugs before conducting clinical trials on humans. This helps identify promising drug candidates more efficiently and reduces the risk of adverse effects during the drug development process.
- **Disease Modelling:** Stem cells can be used to generate disease-specific models, providing researchers with a deeper understanding of various diseases. By creating stem cell lines from patients with genetic disorders or other conditions, scientists can study the disease progression and test potential treatments in a controlled environment.
- **Immunotherapy:** Certain types of stem cells, such as hematopoietic stem cells, are involved in the development of immune cells. In immunotherapy, stem cells can be used to enhance the immune system's response to cancer or other diseases. For example, hematopoietic stem cell transplantation is used to treat certain types of leukaemia and other blood-related disorders.
- **Understanding Developmental Biology:** Studying stem cells helps researchers gain insights into the processes of embryonic development and tissue formation. This knowledge is vital for understanding human development and potential developmental disorders.

Challenges related to stem cell technology are:
- **Ethical Considerations:** The use of embryonic stem cells raises ethical concerns, as it involves the destruction of human embryos. This has led to significant debates about the moral status of embryos and the appropriate ethical guidelines for stem cell research.
- **Immune Rejection:** When stem cells or their derivatives are used in transplantation, there is a risk of immune rejection by the recipient's body. The immune system may recognize the transplanted cells as foreign and attack them, leading to transplant failure. Developing methods to prevent or reduce immune rejection is a major challenge in stem cell therapies.
- **Tumour Formation:** Pluripotent stem cells have the potential to form tumours, if they continue to divide uncontrollably after transplantation.
- **Incomplete Understanding of Stem Cell Biology:** Although significant progress has been made in understanding stem cell biology, there are still many unknown things. The precise mechanisms governing stem cell behaviour, differentiation, and tissue integration are not fully understood.
- **High Costs:** Stem cell research and therapies can be costly due to the need for specialized facilities, skilled personnel, and extensive research. This high cost can limit access to stem cell treatments for many patients.
- **Long-term Safety Concerns:** Long-term effects of stem cell therapies are not always well understood, especially when it comes to potential side effects or adverse events that may arise years after treatment. Rigorous long-term safety studies are essential to ensure patient safety.

Conclusion

Despite these challenges, **ongoing research and advancements in stem cell technology continue to offer hope for addressing many diseases and medical conditions**. Collaborative efforts between scientists, regulators, and ethicists are necessary to overcome these obstacles and unlock the full potential of stem cells in transforming healthcare.

5.8   GRAVITATIONAL WAVE BACKGROUND OF THE UNIVERSE

Latest Context

Recent discoveries by scientists point to the existence of low-frequency gravitational waves, disturbances in the space-time fabric that Albert Einstein's General Theory of Relativity predicted more than a century ago.

Facts About Gravitational Waves:

- **In 2015,** an experiment utilising **Laser Interferometer Gravitational Observatory (LIGO) detector** made the first observation of gravitational waves.
- But the waves had a high frequency, and it is thought that they were created 1.3 billion years ago when two relatively tiny black holes merged.
- For many years, researchers have been searching for low-frequency gravitational waves. Such waves, in their opinion, are **constantly moving through space like background noise**.

First signal of universe's 'background hum'
Evidence announced of low-frequency gravitational waves which create a rumbling throughout space, a major milestone in our understanding of the universe

Pulsars Extinguished stars that emit ultra-regular pulses, which allows for subtle changes in distance to be measured

Pairs of supermassive black holes in the distant universe Generate gravitational waves as their galaxies merge

Large radio telescopes on earth Used to precisely monitor the rotating ticks of pulsars over decades to reveal the faint echoes of distant black holes

Gravitational waves Stretch and squeeze space-time

- Throughout the cosmos, **pairs of supermassive black holes in the centres of galaxies collide and produce gravitational waves. This discovery offers sufficient evidence to contend that our universe contains a gravitational wave background.**
- **Radio astronomers** from five distinct worldwide teams, including **the Indian Pulsar Timing Array (InPTA)**, employed completely different methods to find low-frequency gravitational waves.
- Researchers examined pulsars, which are far-off fast spinning neutron stars that release pulses of radiation that are seen from Earth as dazzling flashes of light, using six big radio telescopes across the globe, including the one in Pune.
- Scientists utilise pulsars as **"cosmic clocks"** because these bursts occur at regular intervals.
- Scientists have claimed that the observed discrepancies were created by abnormalities in space-time generated by gravity waves after studying 25 pulsars over a period of 15 years. These anomalies demonstrated recurrent impacts of gravitational waves.
- It is important for **understanding how gravity works as well.**
- One of the six huge telescopes in the globe that was crucial in presenting evidence was the Giant Metrewave Radio Telescope (GMRT, Pune), which is operated by India.
- **The other five are in Germany, the United Kingdom, France, Italy, and the Netherlands.**
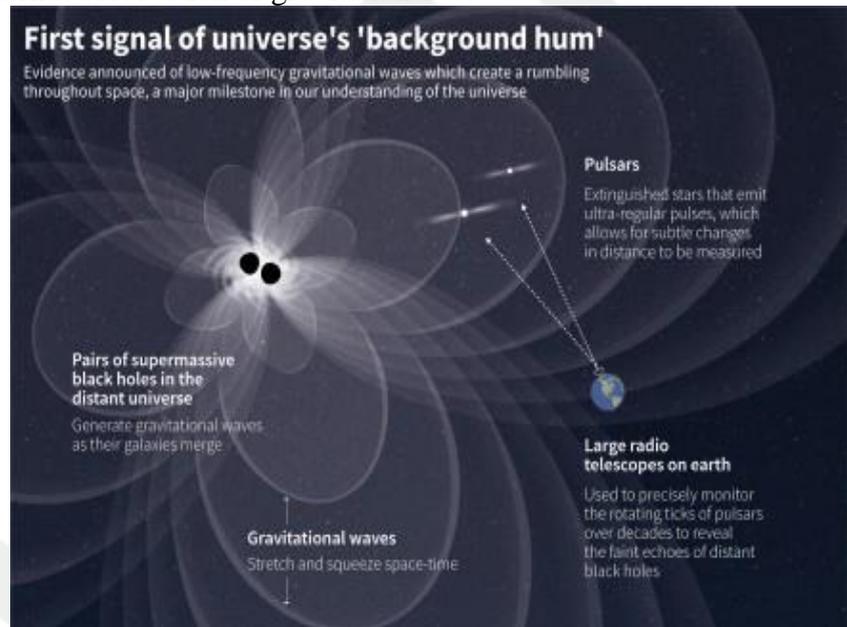
Facts about LIGO

- The **gravitational waves (also known as ripples in space-time)** caused by the movement of massive astronomical objects like **planets and stars are detected by LIGO**, an international network of labs.
- **Albert Einstein's general theory of relativity,** which encompasses our present knowledge of how gravitation operates, initially proposed these waves.
- Multiple orders of magnitude smaller distance changes than the length of a proton is detectable by the LIGO detectors.
- **Light beams** are simultaneously released into both compartments to conduct the experiment. The light should often return to both chambers simultaneously.
- But when a gravitational wave comes through, one chamber lengthens while the other contracts, causing a phase difference in the light waves that come back. The discovery of this phase difference establishes the gravitational wave's existence.

Space-time

In his Special Theory of Relativity, Einstein argued that the three dimensions of space (height, breadth, and depth) and the one dimension of time are actually one continuous four-dimensional continuum known as space-time.

5.9   SHORT NEWS

5.9.1   LI-ION BATTERY

- Recently, the **John Bannister Goodenough**- who was a Nobel prize awardee and the co-inventor of Lithium-ion (Li-ion) batteries passed away.
- Basically, the **Nobel Prize (2019)** in chemistry was awarded jointly to **Goodenough, M. Stanley Whittingham and Akira Yoshino** for the **development of Li-ion batteries.**

About Lithium

- Also known as **'White gold'** due to its high demand for rechargeable batteries. It is a **soft and silvery-white metal.**
- It can be extracted in many ways, depending on the type of the deposit — generally either through.
  a) solar evaporation of large brine pools, or
  b) from hard-rock extraction of the ore.
- It is an **important component of electrochemical cells** used in batteries of EVs, Laptops, Mobiles etc.
- Lithium is also used in making **alloys with aluminium and magnesium**, improving their strength and making them lighter.
  a) Magnesium-lithium alloy - for armour plating.
  b) Aluminum-lithium alloys - in aircraft, bicycle frames and high-speed trains.
- **Chile, Australia and Argentina are the top countries having highest Lithium reserves.**
- **While, Chile, Argentina and Bolivia are also known as Lithium Triangle Countries.**
- Lithium-ion battery is a type of **rechargeable battery that use lithium ions** to store and release electrical energy.
- These batteries are widely used in various electronic devices and applications due to their **high energy density, long cycle life, and relatively low self-discharge rate.**

A better battery
Workings of a lithium-ion cell
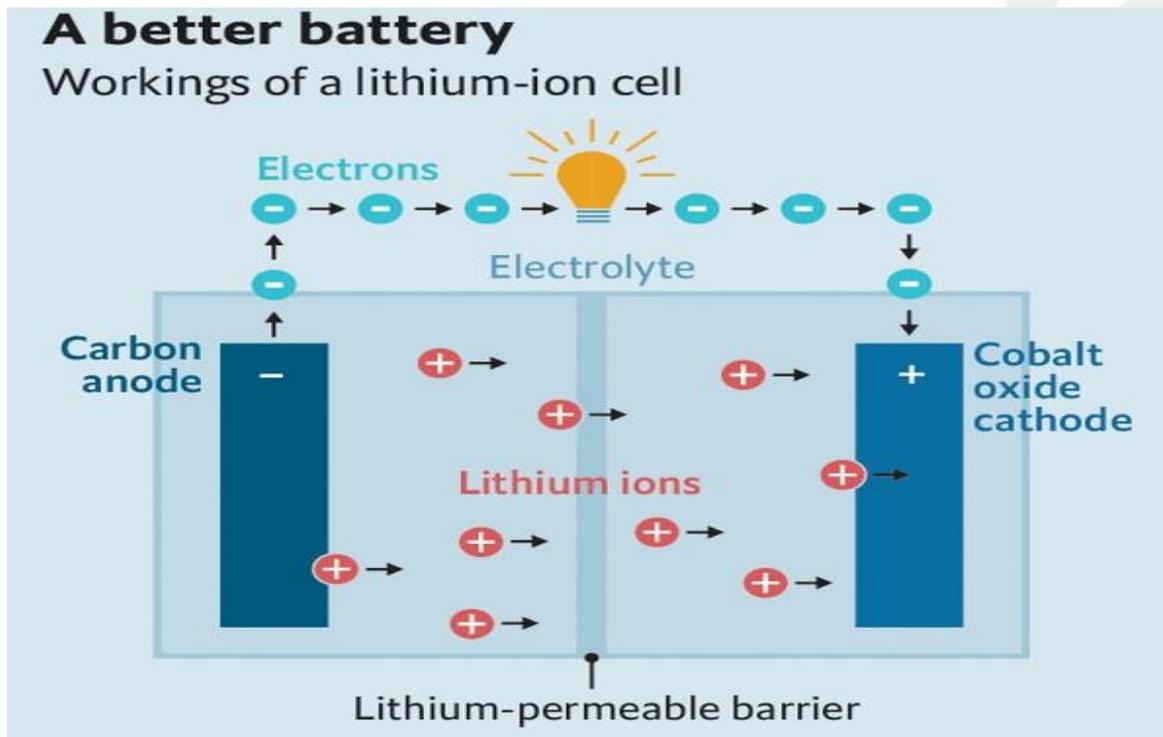
5.9.2 GENETIC ENGINEERING APPRAISAL COMMITTEE

- Recently, in India, five states have denied to give no objection certificates (NOC) of **biosafety research trials of genetically engineered (GE) cotton hybrids**, regulated by the Genetic Engineering Appraisal Committee (GEAC).
    - o These field trials will be conducted in Maharashtra, Gujarat, Telangana, and Haryana.
    - o It has become necessary to obtain '**NOC**' from the state governments for organising field trials since 2011.
- Since agriculture is a **state subject** therefore their engagement is very important for compliance monitoring.
    - o GEAC is the **statutory committee** under the Ministry of Environment, Forest, and Climate Change. It is constituted under the "Rules for the Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/Genetically Engineered Organisms or Cells (Rules, 1989)" framed under the Environment (Protection) Act, 1986.
    - o Its main task is to authorize activities comprising large-scale use of hazardous and recombinants in industrial production.
    - o It conducts **experimental field trials** before releasing any genetically engineered organism into the environment.
- **BT (Bacillus thuringiensis)** Cotton is **hybrid/variety** that cotton contains '**cry1Ac**' and '**cry2Ab**' **genes**, isolated from the soil bacterium Bacillus thuringiensis (Bt) and coding for proteins toxic to bollworm insect pests.
- Bt cotton is the **only GM crop** that has been approved for **commercial cultivation**.

5.9.3 CELL-CULTIVATED MEAT

- US has approved to make and sell **cell-cultivated chicken**. • Cellular agriculture is the process by which animal-based products are produced directly from cell cultures rather than from animals.

- It consists of **two different approaches**: **cell cultivation (cellular)** and **precision fermentation** (**acellular**- contains **no cellular or living material** in the final product like Milk).

- **Singapore** became the **first country** for approving the sale of **cell-cultivated meat** in 2020.
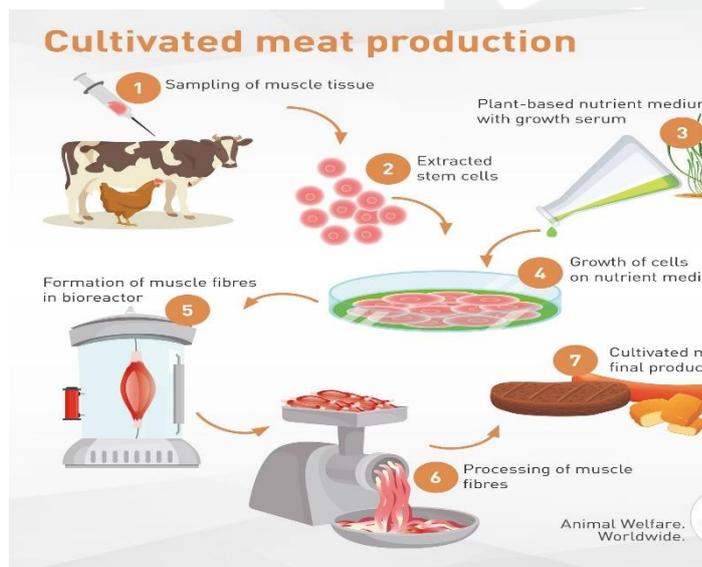
 o **Benefits of cell-cultivated meat**
    - ✓ **Reduce GHGs emissions**: As per FAO, **global livestock** is responsible for **14.5%** of **all anthropogenic GHGs** emissions.
    - ✓ Animal Rights will be protected.
    - ✓ Without changing **dietary habits**, it offers **nutritional security**.
    - ✓ It will be **healthier** than its **animal counterpart** like containing less fat.
    - ✓ In comparison to conventional beef, lab-grown meat requires 45% less energy use.

  o **Challenges**
    - ✓ Its cost is expected to **remain high** in the near future.
    - ✓ **Resource Constraints** such as the availability of high-quality cells, and suitable growth medium.
    - ✓ Difficulty in replicating taste, texture, and fat content like bovine meat.
    - ✓ Uncertainty regarding consumer acceptance due to lack of awareness

5.9.4 MRNA VACCINE

- Drugs Controller General of India (DCGI) approved **India's first mRNA vaccine**.

- **Gennova Biopharmaceuticals** Ltd which produced **GEMCOVAC-OM a mRNA COVID-19** booster vaccine received **Emergency Use Authorization (EUA)** from DCGI.

  o It is a **lyophilized (freeze-dried)** vaccine which is **stable at 2- 8 °C** is delivered using a device called **Tropis**.
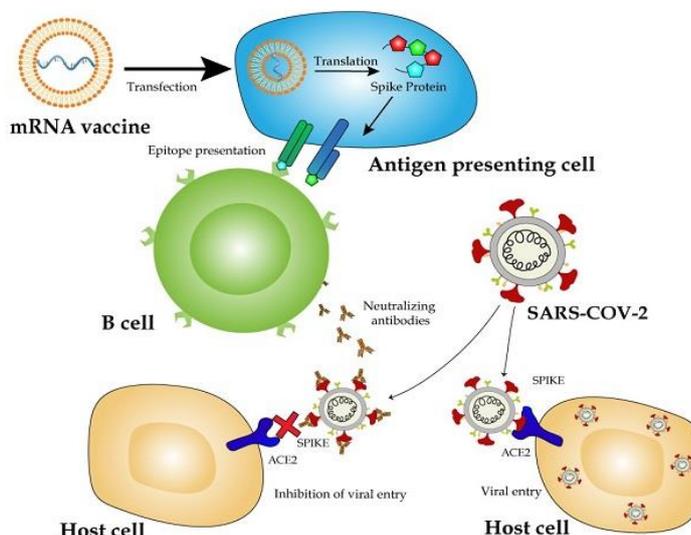
- ✓ **Tropis** uses technology that propels liquid at high pressure in order to deliver vaccines through the skin without utilising needles.
  - o Clinical trials and approval of new drugs/vaccines are governed by **the New Drugs and Clinical Trial Rules 2019** under the provisions of the **Drugs and Cosmetics Act,** of **1940**.
  - o **Central Drugs Standard Control Organisation (CDSCO)**
    - ✓ It is headed by the DCGI which is the ultimate authority to grant approval for Vaccine. Vaccine Testing and subsequent approval comprise the preclinical phase (without testing on humans) and three phases of human clinical trials.
  - o **mRNA vaccine**: This vaccine uses **messenger RNA (mRNA) molecules** for providing instructions to the cells of the body for producing a protein that triggers an immune response against a pathogen.
  - o Once mRNA is injected into the body, the cells read the instructions and produce the protein that stimulates the immune system to recognize and mount a response against the targeted pathogen.

5.9.5 PHAGE THERAPY

- Recently, a study has been conducted that found the Public accepts the **use of bacteria-killing viruses (Phage Therapy)** as **an alternative to antibiotics**.
- There has been an increase in **Antimicrobial Resistance (AMR)** due to improper use of antibiotics. There has been an increasing trend that exhibits bacteriophages as an alternative to antibiotics to control bacterial diseases. Antibiotic resistance will cause the death of 10 million people from drug-resistant diseases every year by 2050

- Phages or Bacteriophages, are viruses that infect and replicate only in bacterial cells. In Phage therapy, **phages** are used to treat bacterial infections.
  - o Bacteriophages were discovered by **Frederick Willian Twort** in 2015 (Great Britain) and **Felix d'Herelle** in 1917 **(France).** Each phage has evolved to more narrowly target bacterial strains or species in contrast to many antibiotics, which remove harmful bacteria, while simultaneously decimating the microbiota (triggering a new set of problems). •
  - o **Significance of phage therapy**
    - ✓ Due to significant differences in bacterial cells and human cells, Phages are unlikely to damage human cells.
    - ✓ Since they have the capability of replication, the initial dosage can be relatively small.
    - ✓ They are inherently nontoxic because thay are made up of **nucleic acids and proteins**.
  - o **Challenges in developing phage therapeutics**
    - ✓ Lack of clinical trials
    - ✓ Time-consuming process of finding the right phages,
    - ✓ Difficulties in patenting phages as they are natural entities etc
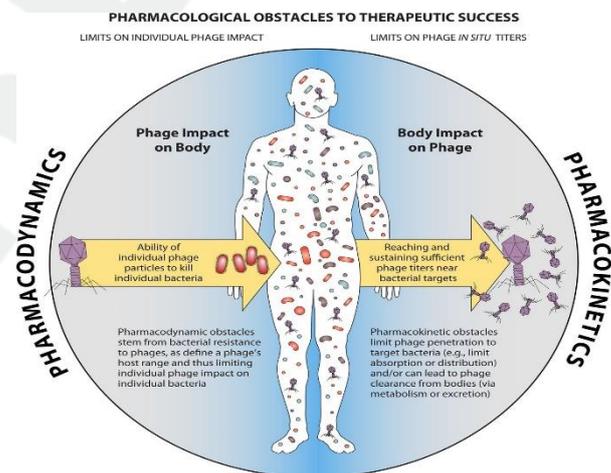
5.9.6 LEPTOSPIROSIS

- The threat of Leptospirosis disease has increased with the onset of monsoon in India.
- Leptospirosis is a **fatal zoonotic bacterial disease**, caused by the **bacterium Leptospira interrogans, or leptospira**.
- It is a **contagious disease** in **animals** (carrier comprises cattle, pigs, rodents, and dogs) but is occasionally transmitted to humans in certain environmental conditions.
- It is widely found in warm, humid countries and in both urban and rural areas. Its symptoms are like of dengue, malaria, and hepatitis.

5.9.7 CAPTAGON PILLS

- Captagon is a highly addictive **amphetamine-type drug** that was produced mainly in Syria. They **stimulate** the **central nervous system** boost energy level, and enhance someone's focus. It enables a person to stay awake for longer periods of time and produces a feeling of euphoria.
- It was widely consumed by Islamic State and Syrian fighters. It is a counterfeit version of medicine with the same brand name first produced in the 1960s and was banned in the 1980s.
- Original Captagon contained **fenetylline**, a synthetic drug of phenethylamine family to which amphetamine also belongs.

5.9.8 PHONONS

- Recently, scientists have successfully **split phonons** that exhibit their quantum properties and ability to **manipulate and control** quantum states.
- **Phonons**: They are **quasiparticles** that show **collective vibrations** of atoms or molecules in a solid material.
  - o This achievement may lead to the development of **sound-based versions** of quantum computers or extremely sensitive measuring devices in future.
  - o Presently, linear optical quantum computing uses photons, particles of light, as qubits (basic units of information for quantum computers).
  - o Both photons and phonons are of **central interest** to **quantum computing research**. But to study phonons is challenging due to their susceptibility to noise and issues with scalability and detection.

- **Difference between Phonons and Photons**

Photons	Phonons
• They are **tiny packets of energy for light** or electromagnetic waves.	• They are **the packets of energy for sound waves.**
• They can travel into empty space.	• They need a medium such as air or water.
• They do not interact at all if they have different wavelengths.	• Phonons of different wavelengths can interact and mix when they bump into each other, producing a different wavelength
• Photons exhibit both particle-like and wavelike properties, known as wave-particle duality	• Phonons are purely wavelike entities and do not exhibit particle-like properties

5.9.9 PROJECT TAARA

- Under **Project Taara, Alphabet** which is the parent company of **Google** is currently deploying its light beam internet technology in India, Africa, and other locations around the world.

- This project uses **Free Space Optical Communication (FSOC) technology** where free space acts as a communication channel between **transceivers** (a device that receives and transmits communication) that are in line-of-sight.

High-throughput links move data wirelessly

Flexible Technology

With a clear line of sight, wireless optical communication technology can transmit data at high speeds of up to 20 Gbps. A single link can cover distances up to 20 km and be used to extend fiber networks.

Long-Range

Long range line-of-sight data transmissions at 20+ km.

High-Speed

High-throughput supports 10-100s Gbps data rates.

  - It uses beams of light to deliver high-speed, high-capacity connectivity over long distances.
  - It can transmit data at high speeds of up to 20 Gbps bidirectional through up to 20 km distances.

- **FSOC Technology:** It means **outdoor optical wireless communication (OWC)**, whereas **short-distance (Largely indoor) OWC** is known as **Light Fidelity (LiFi)**.
  - LiFi uses light within Visible Light Spectrum to Invisible light spectrum to transmit data
  - **Advantages of FSOC technology**: It is cost-effective and quickly deployable and can transmit data at high speed. It is highly effective in areas that are difficult to connect using fiber cables etc.
  - **Challenges**
    - ✓ Reliability on signal is compromised by conditions like fog and haze, or interruptions like birds flying in front of the signal;
    - ✓ It will need better mirror controls and motion detection capabilities etc.

- Earlier Alphabet tried to deliver internet through **Project Loon**, which aimed at utilising stratospheric balloons for internet connectivity.
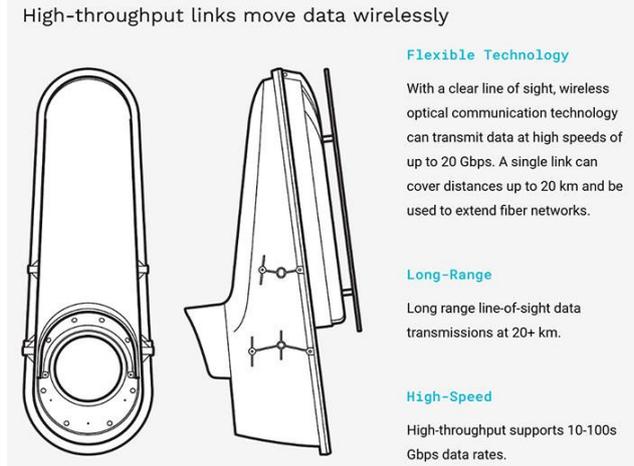
5.9.10 HIROSHIMA AI PROCESS (HAP)

- Recently, Japan hosted the G7 summit in which leaders took an initiative called HAP to **regulate Artificial Intelligence (AI)**. It will be established through a G7 working group in cooperation with OECD and Global Partnership on AI (GPAI).
- With the help of HAP, G7 countries could move towards a divergent regulation based on shared norms, principles and guiding values

5.9.11 SUBMARINE CABLE LANDING IN INDIA

- Telecom Regulatory Authority of India (TRAI) released its report on **'Licensing Framework and Regulatory Mechanism for Submarine Cable Landing in India'**. Through this framework, TRAI is planning to ease the rules for setting up submarine (undersea) cable landing stations (CLS) in India.
- The Department of Telecom (DoT) sought such recommendations while highlighting various concerns regarding the Submarine Cables (SMC) and Cable Landing Stations (CLS) in August 2022.

- o SMC are laid on the ocean floor and digitally connect countries typically, connect terrestrial telecom networks, and the CLS is the location where they make landfall.
- **Key highlights**
    - o **Essential Services and Critical Information Infrastructure (CII) status** can be accorded to CLS and Submarine Cables (SMC) operation and maintenance services.
    - o Exemption of customs duty and GST on the goods and items required for CLS, and submarine operation and maintenance.
    - o Clearances related to Environmental Impact Assessment (EIA) and Coastal Region Zone (CRZ) required for SMC and CLS may also be made online as a part of Saral Sanchar portal.
    - o A section should be added in the Indian Telecommunication Bill, 2022 to promote, protect and prioritise 'CLS' and 'SMC' in India.
    - o The Bill provides a mechanism to exercise the right of way (right to pass over or through real property owned by someone else) for laying telecom infrastructure.

5.9.12 CORONAL MASS EJECTION (CME)

- Scientists spot a **Coronal Mass Ejection (CME)** or **solar eruption** through which constant temperature for six years can be maintained. Scientists from Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital found that the core of CME that occurred in 2017 had maintained a constant temperature. o ARIES, Nainital, is an autonomous institute under the Department of Science and Technology.
- **Highlights of Finding**
    - o Scientists found that despite the core expanding that usually leads to cooling in general, the temperature remained constant. The density of the core decreased by about 3.6 times as it moved outward. The expansion of the core behaved more like an isothermal process (constant temperature) rather than an adiabatic process (where heat exchange occurs).

> **Betelgeuse**
>
> 1. It is **seventh brightest star** in the sky (without counting the Sun) and is spotted in constellation Orion. It is known as '**Thiruvathirai'** or **'Árdra'** in Indian Astronomy.
> 2. It is in its **late carbon-burning stage** as it has already consumed Helium and Hydrogen.
> 3. When it will consume all elements of periodic table, the gravity compresses the core and turn it into neutron star or a black hole.

- **Significance of Finding**
    - o It will improve the understanding of how such eruptions can impact communication systems on Earth. The first solar mission of India, **Aditya-L1** which is equipped with a **Visible Emission Line Coronagraph (VELC)**, will provide more data about CMEs' thermodynamic properties in the inner corona.
    - o CME is a giant cloud of solar plasma having magnetic field lines that are blown away from the Sun often during strong, long-duration solar flares and filament eruptions.

o CME contains particle radiation (mostly protons and electrons) and powerful magnetic fields. They cause disruption of space weather and satellite failures, and power outages etc.

5.9.13 GEMINID METEOR SHOWER

- The mysterious origin of the Geminid meteor shower on Earth is revealed by **Parker Solar Probe**. when Earth passes through the path of a comet, a meteor shower happens. When it takes place, the bits of comet debris generate streaks of light in the night sky because they burn up in Earth's atmosphere.
- As far as the origin of Geminid meteors is concerned, they were created by tiny bits of rocky debris shed from a small asteroid named **3200 Phaethon**, which was **discovered in 1983**.
- Phaethon is small, only about 3 miles across, and it loops around the Sun every 1.4 years in an orbit that approaches the Sun closer than any other known asteroid.

5.9.14 QUASI -MOON

- A new asteroid (dubbed 2023 FW13) along Earth has been discovered by Astronomers recently.
- It is considered a **"quasi-moon"** or **"quasi-satellite**," that means it orbits the sun in a similar time frame as Earth does but is only slightly influenced by Earth's gravitational pull.
- As per Experts, it has been orbiting Earth since 100 BC. Earlier in 2016, **a quasi-satellite** known as **Kamo'oalewa** was also discovered.

5.9.15 IRAN'S FIRST HYPERSONIC MISSILE

- Recently, Iran developed its **first domestically made hypersonic Missile** named **"Fattah"** having a target range of **1,400 km**.
  - o Hypersonic Missile: It refers to a **type of weapon** that travels at **speeds that exceed five times the speed of sound** typically **exceeding Mach 5** or **approximately 6,174 km/h**. It flies at a much lower altitude in comparison to conventional ballistic missiles. There are **two types of hypersonic weapons systems**
    - ✓ **Hypersonic Glide Vehicles** are launched from a rocket before gliding to the intended target.
    - ✓ **Hypersonic Cruise Missiles** powered by **airbreathing high-speed engines** or 'scramjets' after acquiring their target.
- **Advantages of Hypersonic Weapons**
  - o It uses only **kinetic energy** and **energy** derived **from motion** to destroy unhardened targets in underground facilities.
  - o It could enable responsive, long-range, strike options against distant, defended, and/or time-critical threats (such as road-mobile missiles).
  - o It pauses a lot of challenges in detection due to its very high speed, and manoeuvrability.

MACH NUMBER	
Subsonic	**Mach<1.0**
Transonic	**Mach = 1.0**
Supersonic	**Mach>1.0**
Hypersonic	**Mach>5.0**

- The **US, Russia, and China** lead in hypersonic weapons programs, while Australia, India, France, Germany, and Japan are also developing such

technology. As part of its **Hypersonic Technology Demonstrator Vehicle program**, India successfully tested a Mach 6 scramjet. Recently, Hypersonic Wind Tunnel (HWT) test facility of the DRDO has been inaugurated by Defence Minister in Hyderabad, Telangana.

5.9.16 TITANIC SUBMERSIBLE

- Recently, the US Navy claimed that it detected sounds **"consistent with an implosion"** shortly after the submersible lost its contact during a descent into a Titanic wreck at 3,800m (12,467ft) below sea level.
    - o In an explosion, pressure builds up in a contained space until energy is released violently causing debris to project outwards.
    - o While in case of implosion, pressure builds up over a structure (for instance from Water) until it crushes inward causing debris to collapse inward.
- As per experts, the reason is that deep-sea water pressure seems to have crushed the submersible.
- Experts are also pointing out **potential safety problems** with the Titan submersible.
    - o **Hull** - It is the surrounding hollow part where passengers sit. It was made from **carbon fibre** largely untested for deep sea vessels.
    - o Hull of a deep-diving sub is generally spherical for receiving an equal amount of pressure at every point, but Titan's hull was tube-shaped therefore pressure was not equally distributed.

5.9.17 CENTRALIZED LABORATORY NETWORK (CLN)

- Indian Council of Medical Research National Institute of Virology (ICMR NIV) joined CLN which works to test vaccines that can be used during pandemic, epidemic disease outbreaks.
- CLN is a part of the **Coalition for Epidemic Preparedness Innovations (CEPI)** and it is the **largest global group** which has standardised methods and materials for testing.
- As a CLN member, each institution will support the rapid development of novel vaccines against a future **Disease X** – a newly identified pathogen with epidemic or pandemic potential.
    - o In interepidemic periods, facilities will support vaccine development against one or more of CEPI's priority diseases – Chikungunya, Lassa virus, MERS, Nipah etc.

5.9.18 STRATEGIC INTERVENTIONS FOR GREEN HYDROGEN TRANSITION (SIGHT) PROGRAM

- SIGHT is a **sub-component** of the **National Green Hydrogen Mission**. Its objective is to set up an **electrolyser manufacturing base (Component I)** and **green hydrogen-producing facilities (Component II)**.
    - o Hydrogen which is produced with the help of an electrolyser, is a clean-burning fuel with water as its by-product.
        - ✓ Electrolysis is the process of using electricity to split water into hydrogen and oxygen. In general, the **PEM** (Proton Exchange Membrane) is used for electrolysis.
    - o They have been launched with the objective of **enabling rapid scale-up**, technology **development** and **cost reduction**.

- o **Total financial incentive is ₹17,490 crore**
- o State-run **Solar Energy Corporation of India (SECI)** is its implementing agency.
- In 2022, National Green Hydrogen Mission was launched as part of India's decarbonization strategy.
- Its other component is **Strategic Hydrogen Innovation Partnership (SHIP)** which promotes a **Public-Private Partnership** framework for Research & Development.
  - o It seeks to
    - ✓ Production of **5 million tonnes** of **green hydrogen** by 2030.
    - ✓ Make India a leading producer and supplier of Green Hydrogen in the world.
    - ✓ Creating opportunities for employment and economic development.
    - ✓ Supporting R&D projects in India for further development of Green Hydrogen.

5.9.19 UTPRERAK (UNNAT TAKNIKI PRADARSHAN KENDRA)

- Recently, **a Centre of Excellence called 'UTPRERAK'** to accelerate the **adoption of energy-efficient technologies** in the Indian Industry has been set up by the Ministry of Power.
- Bureau of Energy Efficiency (BEE) set up this Centre. It will support and implement projects in areas like training/capacity building, a showcase for energy-efficient technologies, an information centre and knowledge repository etc.
- It is mandated to become the key reference and resource institution on industrial energy-efficient technologies

5.9.20 CHIRAL BOSE LIQUID

- Recently, Physicists belonging to USA and China claimed the discovery of a completely **new state of matter namely "Chiral Bose Liquid State"**. They discovered the **Chiral-Bose liquid state** in the **super-small quantum scale** by bringing **two layers of a special material very close together** at a **very low temperature** (close to absolute zero).
- They developed a **"frustration machine,"** a bilayer semiconducting device designed to create this state of matter.
- This "machine" functions by incorporating an electron-rich top layer (where electrons move freely) and a corresponding bottom layer with "holes" that electrons can occupy.
- The machine creates a **local imbalance** that results in **electrons not having enough holes** to fill and this kicks off the novel state called the chiral base liquid state.
  - o In this "quantum" state of matter, matter behaves in ways quite different from the solid, liquid, gaseous states. Particle interactions within these states can give rise to infinite possibilities.
  - o This new state could provide a pathway for finding a more secure and reliable way to encode digital information.
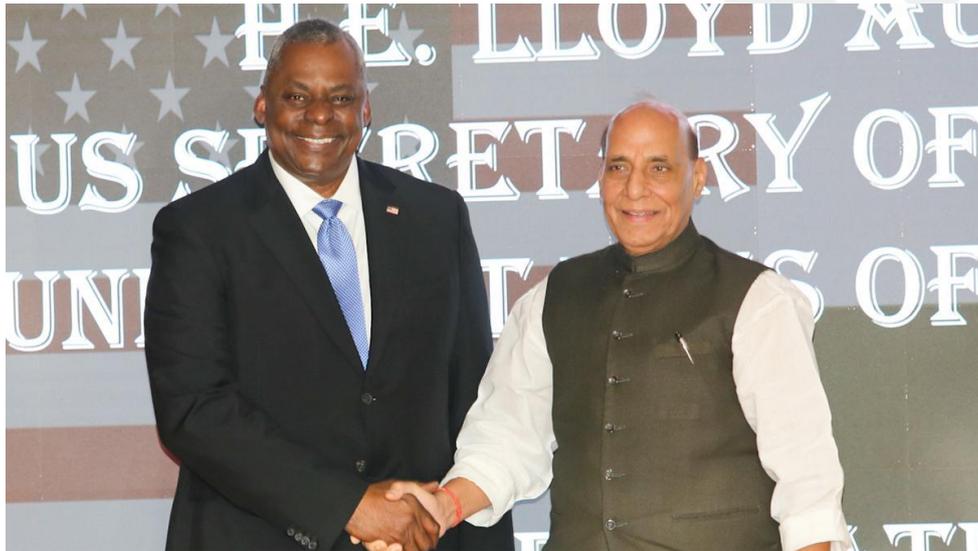
6. INTERNATIONAL RELATIONS

6.1   INDIA-US RELATIONS

Latest Context

To promote long-term supply chain stability and increase the security and defence cooperation between India and the United States, negotiations have been started for a 'Security of Supply' (SoS) arrangement and a 'Reciprocal Defence Procurement' (RDP) agreement Recently.

Key Facts:
- The objective of SoS agreement which is a bilateral or multilateral agreement between countries is to ensure the availability and stability of critical supplies, especially in the field of defence and security.
- India and the US also have an RDP agreement which is bilateral by nature in the field of defense procurement. Its objective is to promote reciprocal procurement of defense items in addition to promoting cooperation in research, development, and production of defense equipment.

Key Highlights of the Agreement
- **Assembling Electric Jets in India:** India and the US have discussed the deal for assembling **General Electric GE-414 jets** in India. It is yet to be finalized.
- **Capacity Building and Infrastructure Development**
- To build the capacity in addition to the Maritime Domain Awareness (MDA) and strategic infrastructure development.
- It also comprises the increased sourcing by US companies from India especially Boeing under the mega-civil aircraft deal with Air India. Furthermore, it also includes the establishment of **Maintenance, Repair and Overhaul (MRO)** facilities by US companies in India in order to cater to the equipment used by the Indian armed forces and the region.
- **Defence Industrial Cooperation:** India and the US concluded the roadmap for 'Defence Industrial Cooperation' which will be the guiding principle for their policy orientation for the next few years. Under this mechanism, India and the US will identify opportunities for the co-development of new technologies and the co-production of

existing and new systems in addition to promoting collaboration between defense start-up ecosystems.

US-India Defence Acceleration Ecosystem (INDUS-X): To advance cutting-edge technological cooperation between US and Indian companies, investors, start-up accelerators, and academic research institutions an initiative titled "INDUS-X" has been launched by the US-India Business Council.

The Trajectory of Indo-US Relations
- **Introduction:** The strategic partnership of U.S.-India is based on shared values comprising a commitment to democracy and upholding the rules-based world order. They share a common interest in promoting stability, global security, and economic prosperity by way of trade, investment, and connectivity.
- **Economic Relations:** The U.S. has become India's biggest trading partner in 2022-23 due to increasing economic ties which are growing day by day. The bilateral trade between India and the U.S. was USD 119.5 billion in 2021-22 which has increased by 7.65% to USD 128.55 in 2022-23. Exports to the U.S. was USD 76.18 billion in 2021-22 was increased by 2.81% to USD 78.31 billion in 2022-23.
- **International Cooperations**
- There is a very close cooperation between the US and India in various multilateral forums such as the United Nations, G-20, Association of Southeast Asian Nations (ASEAN) Regional Forum, International Monetary Fund, World Bank, and World Trade Organization.
- Furthermore, India joined the UN Security Council in 2021 for a two-year term which was welcomed by the US. In addition, the US also supports a reformed UN Security Council that includes India as a permanent member. Countries like Japan, the US, Australia and Japan, and India convened the QUAD in order to promote **a free and open Indo-Pacific** and provide tangible benefits to the region.
- India is also a very important member of the United States-led economic initiative **Indo-Pacific Economic Framework for Prosperity (IPEF)**. In addition, India is also a member of the **Indian Ocean Rim Association (IORA)**, at which the United States is a dialogue partner.

Way Forward
- In the forthcoming period, the partnership between India and the US is very critical to securing a free, open, and rules-bound Indo-Pacific region.
- Vast demographic dividend provides numerous occasions for the US and Indian firms for transfer of technology, manufacturing, trade and investment.
- Constantly growing stature of India as a leading player at the international level which is the result of unprecedented transformation at each level will proffer it numerous opportunities to advance its vital interests.

6.2   VISIT OF NEPAL'S PM TO INDIA

Latest Context:
Recently during the visit of Prime Minister of Nepal to India, several initiatives and agreements were signed between the two countries.

Key initiatives and agreements are:

- Both countries **agreed to resolve the long-standing boundary dispute** with mutual understanding.
- **Two Integrated Check Posts (ICPs)** were inaugurated, one in **Rupaidiha in India** and the other in **Nepalgunj in Nepal.**
- **Various MoUs were signed for:**
  a) Development of **Dodhara Chandani check post** along the India-Nepal Border,
  b) Development of **Phukot- Karnali Hydroelectric Project,**
  c) **Cross border payment system** between the two countries,
  d) Laying the **cross-border petroleum pipeline** between **Siliguri in India and Jhapa in Nepal,**
  e) **Extension of Motihari-Amlekhganj pipeline** to Chitwan in Nepal.
- India has given its consent to the **first trilateral power trade from Nepal to the Bangladesh through India for up to 40 MW of power.**
- **India agreed to provide Nepal, the access to inland waterways of India.**
- India **agreed to provide Line of Credit (LoC) of almost $680 million** to fund 3 major transmission corridors in Nepal and these are Bheri Corridor, Nijgadh-Inaruwa Corridor and Gandak-Nepalgunj corridor.
- India has given assurance to build two additional bridges across the Mahakali River.

INDIA-NEPAL RELATIONS

Background:

- **1950:** India and Nepal signed the **Treaty of Peace and Friendship**, which established a close bilateral relationship and led to an open border system between the two countries.

- **1962:** Tensions emerged between India and Nepal when **India accused Nepal of giving shelter to Tibetan refugees involved in the Tibetan uprising** against Chinese rule. This incident took the relations to a low level for a temporary period.
- **1988:** Nepal and India signed the **Indo-Nepal Trade and Transit Treaty**, which further strengthened economic ties and led to increased trade between the two nations.
- **1990:** Nepal witnessed the People's Movement, also known as the **'Jana Andolan'**, which led to the restoration of democracy in the country. **India played a significant role in bringing democracy in the Nepal by supporting those who were in favour of democracy.**
- **2001:** Crown Prince Dipendra of Nepal killed his own family members, including King Birendra and Queen Aishwarya, before committing suicide. **This tragedy brought a period of instability to Nepal, and India offered support during this time.**
- **2005:** The **Comprehensive Peace Agreement** was signed between the Nepali government and Maoist rebels, ending a decade-long civil war. India played a big role in facilitating the peace process.
- **2015: Nepal was hit by a huge earthquake** and **India provided extensive humanitarian and relief assistance to help Nepal recover from the disaster.** In 2015-2016, there was a temporary strain in India-Nepal relations, when Nepal accused India of imposing an unofficial blockade during the Madhesi protests (local community of Nepal supported by India). The blockade led to economic hardships in Nepal and deepened the mistrust between the two nations.
- **2020:** In 2020, **Indian President Ram Nath Kovind visited Nepal** to mark the 150th birth anniversary of Mahatma Gandhi, signalling a desire to strengthen bilateral ties.
- **2021:** In 2021, a **new political map of Nepal was passed by the Parliament of Nepal, which showed the disputed areas of Kalapani, Lipulekh, and Limpiyadhura as part of Nepal's territory,** escalating border tensions with India.

In area of Trade and Economy:
- India remains Nepal's largest trade partner, with bilateral trade crossing **USD 7 billion in FY 2022-23.**
- **India provides transit for almost the entire 3rd country trade of Nepal.**
- **Indian firms are among the largest investors in Nepal**, accounting for more than 33% of the total Foreign Direct Investment (FDI) stock in Nepal.

In area of Connectivity:
- Basically, Nepal is a **landlocked country** and is surrounded by India from three sides and one side of it is open towards Tibet, which has very limited vehicular access.
- Both the countries have **undertaken various connectivity programs** to increase people-to-people linkages and promote economic growth and development.

In area of Defence Cooperation:
- Defence cooperation between the two countries include **assistance to the Nepalese Army in its modernisation** program by providing equipment and training.
- The **Gorkha regiment of the Indian Army** has soldiers from hill districts of Nepal.
- Every year, India undertakes a joint military exercise with Nepal, known as **'Surya Kiran'.**

Partners in many Multilateral Forums:
Both India and Nepal are members of many multilateral forums such as BBIN (Bangladesh, Bhutan, India, and Nepal), BIMSTEC (Bay of Bengal Initiative for Multi Sectoral Technical and Economic Cooperation), Non-Aligned Movement, and SAARC (South Asian Association for Regional Cooperation) group etc.

Challenges are:
- **Territorial Disputes:** Biggest challenge between the Indo-Nepal ties is the **'Kalapani Boundary Issue'.** These boundaries have been fixed in 1816 by the British, and India got the areas over which the British has exercised territorial control till 1947.
- **Issues with Peace and Friendship Treaty:** The **Treaty of Peace and Friendship (1950)** was signed by the Nepali authorities to continue the special links they had with British India and this treaty opened the border between the two countries and gives the people of Nepal, a right to work in India. But today, **this treaty is viewed as a sign of an unequal relationship, and an Indian imposition.**
- **China's Intervention:**
  a) In recent years, Nepal has drifted away from India's influence, and China has gradually filled the space with investments, aid and loans.
  b) China considers Nepal a key partner in its **'Belt and Road Initiative' (BRI),** and want to invest in Nepal's infrastructure as part of its grand plans to boost global trade.
- **Internal Security: Indo-Nepal border is open and lightly policed**, which is used by many terrorist outfits and insurgent groups from North Eastern part of India e.g., supply of trained cadres, fake Indian currency etc.

Way Forward
- **India should try to become a little more sensitive and generous partner**, for its "neighbourhood first" policy to become successful.
- India **needs to engage more proactively with the Nepal in terms of people-to-people engagement,** bureaucratic engagement as well as political interactions.

6.3   CHINA'S RISING INFLUENCE IN CENTRAL ASIA

Latest Context:
Recently, China hosted the "C+C5 summit" with the leaders of 5 Central Asian countries.

Highlights of the summit are:
- **First C+C5(China + 5 Central Asian countries) summit was held in virtual format in 2022**, to commemorate the 30th anniversary of

diplomatic relations between China and the Central Asian countries.
- At the summit, **'Xi' Declaration'** was adopted which include a blueprint for the future development of China-Central Asia relations.
- Other areas of focus were **people-to-people exchanges** and the issues related **to regional terrorism and extremism.**
- China has been investing heavily in Central Asia through its **Belt and Road Initiative (BRI) initiative.**

Implications of rising influence of China in Central Asian region for India are:
- **Geostrategic Concerns:** Central Asia is located in India's extended neighbourhood and has historical and cultural connections with India. China's increasing influence in the region can potentially change the geopolitical dynamics and can create challenges for India's regional interests and security.
- **Encirclement:** With China's growing presence in Pakistan and its investments in infrastructure projects like the China-Pakistan Economic Corridor (CPEC), there are concerns in India that this could lead to a strategic encirclement, limiting India's access to Central Asia and the wider Eurasian region.
- **Economic Competition:** Central Asia is rich in natural resources and presents economic opportunities for regional powers. China's Belt and Road Initiative (BRI), which includes projects in Central Asia, can enhance connectivity and trade in the region. However, India may face economic competition with the China.
- **Access to Energy Resources:** Central Asia is a significant source of energy, particularly oil and natural gas. As China strengthens its energy ties with the region, India's energy security may be affected as it will face increased competition and higher prices for resources.
- **Diplomatic Isolation of India:** If Central Asian countries align more closely with China economically and politically, India can find itself diplomatically isolated in the region. This can reduce India's influence and bargaining power in regional forums and limit its ability to advance its interests.
- **Security Concerns:** Instability in Central Asia can have bad implications for India's security. The presence of extremist groups in the region can pose security challenges for India.

Initiatives taken by India to increase its presence in Central Asian region are:
- **Connect Central Asia Policy:** India's "Connect Central Asia" policy, launched in 2012, focuses on deepening political, economic, and cultural ties with the Central Asian nations. It aims to increase connectivity, trade, and people-to-people contacts between India and the Central Asian countries.
- **India-Central Asia Dialogue:** India holds regular bilateral and multilateral dialogues with Central Asian countries to discuss various issues of mutual interest, including political cooperation, economic partnerships, and regional security.
- **Investment and Trade:** India has been actively promoting economic cooperation with Central Asian countries. It encourages Indian businesses to invest in sectors such as energy, infrastructure, pharmaceuticals, and information technology in the region. Efforts have been made to enhance trade ties and reduce trade barriers between India and Central Asian nations.
- **Development Partnerships:** India has offered development assistance and capacity-building programs to Central Asian countries. These initiatives include providing

scholarships to students, offering technical assistance, and supporting infrastructure projects.

- **Chabahar Port:** It is not located in Central Asia but India's development of the Chabahar Port in Iran holds significance for enhancing connectivity to Afghanistan and Central Asia. This port offers an alternative route that bypasses Pakistan, providing Central Asian countries access to the Arabian Sea and Indian markets.
- **International North-South Transport Corridor (INSTC):** India is a key participant in the INSTC project, which aims to facilitate multimodal transportation between India, Iran, and Russia, passing through Central Asia. The corridor can significantly improve trade and connectivity in the region.
- **Cultural Exchanges:** India and Central Asian countries actively promote cultural exchanges to develop greater understanding and goodwill. Events such as festivals, art exhibitions, and cultural programs are organized to showcase the rich cultural heritage of both regions.
- **Educational Partnerships:** India has signed agreements with several Central Asian countries to promote academic cooperation and exchange of students and scholars. Indian universities also offer scholarships and training programs to students from the region.

What can be the Way Forward for India?
- **Economic Engagement:** India should focus on deepening economic ties with Central Asian countries. This can be achieved through trade agreements, investment promotion, and the identification of new sectors for collaboration. India should explore opportunities for joint ventures and infrastructure projects to improve connectivity trade.
- **Connectivity Projects:** India should actively participate in regional connectivity projects, such as the International North-South Transport Corridor (INSTC) and the Chabahar Port in Iran. These projects can provide alternate routes for trade and connectivity with Central Asia and will help in reducing dependence on traditional routes that passes through Pakistan.
- **Energy Cooperation:** Due to Central Asia's abundant energy resources, India should seek to strengthen energy partnerships with the region. Long-term energy agreements and joint ventures in the oil and gas sector can contribute to India's energy security.
- **Cultural Exchanges:** Promoting cultural exchanges and people-to-people contacts is vital for developing better understanding and goodwill between India and Central Asian nations. Scholarships, educational programs, and cultural events can facilitate such exchanges.
- **Security Cooperation:** India should actively engage in regional security forums and initiatives, such as the Shanghai Cooperation Organization (SCO), to address common security challenges like terrorism, drug trafficking, and extremism.

6.4 ROLE OF DEFENCE COOPERATION INITIATIVES IN MEETING FOREIGN POLICY GOALS

Latest Context:
Recently, India gifted the indigenously built missile corvette (it's a small warship) INS Kirpan to Vietnam.

More about the news:
- Many experts pointed out that, **in the recent times India has expanded its activities of military cooperation, humanitarian assistance, contribution to UN Peace Keeping Forces, etc.**
- At present, India has defence cooperation agreements with almost **53 countries** and this type of defence cooperation is termed as **'Defence Diplomacy'.**
- The **Defence Production and Export Promotion Policy 2020,** released by the Ministry of Defence targets an increase in export of aerospace and defence goods and services.

Linkage between Defence Cooperation and Foreign Policy
- **National Security**: Defence cooperation is a crucial component of a country's national security strategy. Through cooperation with other nations, countries can enhance their capabilities, share intelligence, and can build a strong defence. This cooperation helps protect a country's interests and sovereignty and contributes to regional and global stability, aligning with the goals of its foreign policy.
- **Alliance Building:** Defence cooperation often involves forming military alliances with other countries. These alliances are based on shared security concerns and mutual interests, and they provide a framework for countries to collaborate on defence matters. For example, NATO (North Atlantic Treaty Organization) is a prime example of a military alliance built on the principles of collective defence.
- **Diplomacy and Negotiation:** Defence cooperation can be a crucial element in diplomatic relations between the countries. Negotiating defence agreements and engaging in joint military exercises can promote trust and cooperation between nations. In times of crisis or tension, such established cooperation can serve as a basis for diplomatic efforts to de-escalate conflicts.
- **Geopolitics:** Defence cooperation is often influenced by a country's geopolitical interests. Engaging in military partnerships or collaborations with certain nations can strengthen a country's presence in specific regions and can serve as a counterbalance to other powers.
- **Bilateral Relations:** Defence cooperation can significantly impact bilateral relations between countries. By sharing military expertise, technology, and resources, countries can deepen their ties and strengthen overall diplomatic relations. It can also lead to the exchange of other resources, trade agreements, and cultural exchanges, all of which are integral components of foreign policy.

Benefits of defence cooperation to foreign policy goals
- **Enhanced Security:** Defence cooperation allows countries to pool resources, share intelligence, and coordinate efforts to address shared security challenges. By increasing each other's security capabilities, countries can better protect their interests and sovereignty, contributing to the overall stability of their regions and the world.
- **Deterrence and Strategic Influence:** Collective defence arrangements and military partnerships can enhance deterrence against potential adversaries
- **Increased Regional Stability:** Defence cooperation can promote stability in a region by promoting dialogue, trust-building, and conflict resolution. Through joint military exercises and engagement in peacekeeping missions, countries can contribute to regional security.
- **Strengthened Alliances and Partnerships:** Defence cooperation deepens the bonds between nations, strengthening their diplomatic ties and alliances. These partnerships can extend beyond the defence sector and influence economic, political, and cultural

cooperation, aligning with foreign policy goals of building strong, reliable relationships with other countries.

- **Humanitarian and Peacekeeping Contributions:** By engaging in defence cooperation, countries can better respond to humanitarian crises and participate in international peacekeeping missions.

- **Support for Democracy and Shared Values:** Defence cooperation often involves collaborating with like-minded democracies and countries that share similar values. By aligning with such partners, countries can advance their foreign policy goals of promoting democratic principles, human rights, and rule of law on the international stage.

- **Access to Advanced Technology and Training:** Defence cooperation can provide access to advanced military technology and training opportunities. This can improve a country's defence capabilities and can improve its overall military readiness.

Conclusion

Defence cooperation offers numerous advantages that are closely aligned with a country's foreign policy goals. By working together with other nations on defence matters, countries can enhance their security, build lasting alliances, and contribute to global peace and stability, all while promoting their values and interests on the international stage.

6.5   US REJOINED UNESCO

Latest Context:
Recently, the United States (US) formally rejoined the UNESCO after a 5-year absence by agreeing to pay its due of almost $ 600 million.

About UNESCO
- United Nations Educational, Scientific and Cultural Organization (UNESCO) is a **specialized agency of the United Nations (UN).**
- It aims to build peace through international cooperation in **Education, the Sciences and the Culture.**
- It is also a member of the **United Nations Sustainable Development Group (UNSDG),** a coalition of UN agencies and organizations aimed at fulfilling the Sustainable Development Goals (SDGs).
- UNESCO's **Headquarter is located in Paris** and the Organization has more than 50 field offices around the world.
- It has a total of **193 Members and 11 Associate Members** and is governed by the General Conference and the Executive Board.
- 3 UNESCO member states are not UN members: **Cook Islands, Niue, and Palestine.**
- While, 3 UN member states **(Israel, Liechtenstein and the United States)** are not the members of UNESCO but now the US is in the process of joining UNESCO.

US and the UNESCO
- The **US was one of the founding members of UNESCO**, when the organization was established in **1945.**
- For several decades, the U.S. played an active role in UNESCO's activities, supporting its goals and contributing to its programs in the fields of education, science, culture, and communication.
- Over the years, **there have been instances of strained relations between the United States and UNESCO,** leading to periods of non-membership and withholding of funding.

- **In 1984**, the **U.S. withdrew from UNESCO**, citing concerns about the organization's management and alleged anti-Western bias. During this period of non-membership, the U.S. continued to participate in some of UNESCO's programs as a non-member observer.
- **In 2003,** the U.S. rejoined UNESCO under the administration of President George W. Bush, expressing renewed support for the organization's mission and objectives. However, the tensions resurfaced again in **2011** when UNESCO admitted Palestine as a full member, leading to a significant reduction in U.S. funding to the organization.
- As a result of the 2011 admission of Palestine, the **U.S. was required to cut off its funding to UNESCO due to a law passed in the US in 1990s that prohibits the U.S. from providing funds to any UN agency that grants full membership to Palestine.**
- This financial withdrawal has serious implications for UNESCO, as the U.S. was one of its major financial contributors, accounting for a significant portion of the organization's budget.
- Despite the funding cutoff, the U.S. continued to participate in some UNESCO programs and initiatives. Additionally, there have been ongoing discussions and debates within the United States regarding the country's relationship with UNESCO and the implications of withholding funding.
- **In 2017**, after the naming **of ancient Jewish sites as Palestinian heritage sites,** the **US announced its withdrawal from the body for the second time which came into effect by end of 2018.**

Issues faced by UNESCO are:
- **Funding:** UNESCO's programs and initiatives rely heavily on member states' financial contributions. However, securing adequate and sustained funding can be challenging, especially during times of economic uncertainty or political tensions among member states.
- **Political Influence:** As a multilateral organization with 193 member states, UNESCO must navigate differing political interests and ideologies. This can sometimes lead to disagreements and difficulties in reaching consensus on certain issues.
- **Preservation of Cultural Heritage:** Protecting and preserving cultural heritage sites and intangible cultural heritage is a significant challenge for UNESCO. Factors such as urbanization, armed conflicts, natural disasters, and climate change pose threats to these invaluable assets.
- **Educational Inequalities:** Ensuring access to quality education for all remains a significant challenge, particularly in developing countries or regions affected by conflict and instability.
- **Freedom of Expression and Media Freedom:** UNESCO's works to promote freedom of expression and worldwide. However, attacks on journalists, restrictions on media, and censorship continue to be challenges in various parts of the world.
- **Technology and Digital Divide:** Bridging the digital divide and ensuring equitable access to information and communication technologies are crucial challenges for UNESCO as technology becomes increasingly central to education, culture, and communication.
- **Global Health and Education Crisis:** The COVID-19 pandemic has increased existing educational disparities, with millions of students facing disruptions to their education due to school closures. UNESCO has been actively addressing the challenges arising from the pandemic's impact on education.
- **Climate Change and Environmental Sustainability:** As an organization that promotes scientific research and environmental conservation, UNESCO faces the challenge of addressing climate change and promoting sustainability to protect natural resources and ecosystems.

- **Displacement and Migration:** UNESCO works to support education and cultural preservation in regions affected by displacement and migration, such as refugee camps. Providing education and preserving cultural identities can be challenging in such contexts.

Way Forward:
- **Sustainable Funding:** UNESCO needs to secure sustainable and diverse funding sources to ensure the continuity and effectiveness of its programs. This may involve exploring innovative financing mechanisms, public-private partnerships, and increasing contributions from member states.
- **Strengthening Multilateralism:** UNESCO should continue in promoting multilateral cooperation and dialogue among member states, promoting understanding, and finding common ground on global issues. Emphasizing the importance of multilateralism can help overcome political differences and facilitate constructive collaboration.
- **Cultural Heritage Protection:** UNESCO must intensify efforts to protect and preserve cultural heritage, both tangible and intangible. This includes assisting member states in safeguarding endangered sites, promoting cultural diversity, and raising awareness about the importance of heritage conservation.
- **Education for All:** UNESCO should work towards providing equitable access to quality education for all, including marginalized and vulnerable populations. Addressing educational inequalities and focusing on lifelong learning will be important in building inclusive and sustainable societies.
- **Advocacy for Freedom of Expression:** UNESCO must continue advocating for freedom of expression, press freedom, and media pluralism worldwide. Supporting independent journalism and combating disinformation are essential for promoting democratic societies.
- **Climate Action and Sustainability:** Strengthening efforts to address climate change and promoting environmental sustainability should be a priority for UNESCO. The organization can play a significant role in advancing scientific research, environmental conservation, and education on climate-related issues.
- **Engaging Youth:** UNESCO should actively involve young people in its initiatives, considering their perspectives and ideas when shaping policies and programs. Empowering youth to participate in decision-making can contribute to more relevant and effective decisions.

6.6 75 YEARS OF THE UNIVERSAL DECLARATION OF HUMAN RIGHTS (UDHR)

Latest Context:
The year 2023 marks the 75 years of adoption of "Universal Declaration of Human Rights" (UDHR).

More on news:
- On the occasion of 75th anniversary of the UDHR, the year-long **"Human Rights 75"** initiative was launched.
- **Theme:** "**Dignity, Freedom, and Justice for All**".
- **Objective of Human Rights 75 initiative: "Contribute to change and serious efforts on the issues like freedom, equality, justice and accountability".**

About the UDHR
- It was **adopted by the United Nations General Assembly (UNGA) on December 10, 1948 in Paris.**

- The declaration **arose from the experience of World War II,** as a lot of atrocities and human rights violations were witnessed during that period.
- The **UDHR is not a legally binding treaty** but it carries immense moral and political weight.

THE UNIVERSAL DECLARATION OF HUMAN RIGHTS

1 Equality
Everyone is born **free** and **equal** in **dignity** and with rights.

2 Freedom from Discrimination
You should never be discriminated against for any reason.

3 Life, Liberty and Security
Everyone has the right to life, liberty and personal security.

4 Freedom from Slavery
No-one shall be held in slavery or servitude.

5 Freedom from Torture
No-one shall be subjected to torture or to cruel or degrading treatment.

6 Recognition as Person Before Law
You have the right to be treated as a person in the eyes of the law.

7 Equality Before the Law
You have the right to be treated by the law in the same way as everyone else

8 Remedy by Tribunal
Your have the right to remedy by competent tribunal.

9 Freedom from arbitrary arrest
No-one shall be subject to arbitrary arrest, detention or exile.

10 Fair Public Hearing
You have the right to a fair public hearing.

11 Innocent until Proven Guilty
You have the right to be considered innocent until proven guilty.

12 Privacy
No-one has the right to interfere with your privacy, family, or home.

13 Freedom of Movement
You have the right to freedom of movement in and out of the country.

14 Asylum
You have the right to seek asylum in other countries from persecution.

15 Nationality
You have the right to a nationality.

16 Marriage and Family
You have the right to marriage and to raise a family.

17 Property
You have the right to own property.

18 Freedom of Belief
You have the right to freedom of belief and religion.

19 Freedom of Opinion
You have the right to freedom of opinion and expression.

20 Freedom of Assembly
You have the right to freedom of peaceful assembly and association.

21 Take Part in Government
You have the right to take part in the government of your country.

22 Social Security
You have the right to social security.

23 Work
You have the right to desirable work and to join trade unions.

24 Rest and Leisure
You have the right to rest and leisure.

25 Adequate Living Standard
You have the right to a decent life, including food, clothing, housing, and medical care.

26 Education
You have the right to education

27 Participate in Cultural Life
You have the right to Participate in the Cultural Life of Community.

28 Social Order
You have the Right to a Social Order that Articulates this Document.

29 Mutual Responsibility
We all have a responsibility to the people around us and should protect their rights and freedoms.

30 Freedom from State or Personal Interference
There is nothing in this declaration that justifies any person or country taking away the rights to which we are all entitled.

Key features of the UDHR are:

- **Universal Rights:** The UDHR emphasizes that human rights are inherent to all individuals and are not subject to any form of discrimination. It applies to everyone, regardless of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status.

- **Civil and Political Rights:** The declaration includes rights such as the right to life, liberty, and security of person; freedom from torture and slavery; freedom of thought, expression, and religion; the right to a fair trial, and more.
- **Economic, Social, and Cultural Rights:** The UDHR recognizes the right to work, education, food, housing, and healthcare as essential components of human dignity and well-being.
- **Interconnectedness of Rights:** The document emphasizes that all human rights are interrelated, interdependent, and indivisible. The fulfilment of one right often depends on the fulfilment of others.

What is the significance of UDHR?
- **Foundational Document:** The UDHR is a foundational document in the modern human rights framework. It was the first time in history that a universal set of human rights was recognized and proclaimed by the international community.
- **Universal Recognition:** The UDHR is universally recognized and accepted as a standard of human rights. It has been translated into over 500 languages and is one of the most translated documents in the world.
- **Inspiration for Human Rights Law:** The principles mentioned in the UDHR have influenced the development of subsequent international human rights treaties and conventions like Convention on the Prevention and Punishment of the Crime of Genocide (1948), Convention on the Rights of the Child (1989), Convention on the Rights of Persons with Disabilities (2006), Refugee Convention (1951) etc.
- **Education and Awareness:** The UDHR has been a crucial resource for human rights education and awareness-raising. It helps inform people about their rights and responsibilities and encourages them to stand up for human rights in their communities and beyond.
- **Global Consensus on Human Rights:** The adoption of the UDHR shows that there is a global consensus on fundamental human rights. It represented a collective commitment by the international community to protect and promote human rights for all.
- **Framework for Justice and Peace:** The UDHR emphasizes that respect for human rights is essential for promoting justice, peace, and stability. It presents the link between human rights, development, and security.

Challenges to Human Rights are:
- **Armed Conflicts and Violence:** Armed conflicts and violence in various regions of the world lead to grave human rights violations, including civilian casualties, displacement, and atrocities against vulnerable populations.
- **Discrimination and Inequality:** Discrimination based on race, ethnicity, religion, gender, sexual orientation, disability, and other factors remains a challenge, leading to the denial of basic rights and opportunities for marginalized communities.
- **Economic Injustice and Poverty:** Poverty and economic inequality hinder the enjoyment of fundamental human rights, such as access to education, healthcare, and adequate standards of living.
- **Corruption and Lack of Accountability:** Corruption and weak governance can undermine the rule of law, making it difficult to address human rights violations and promote justice.
- **Refugee and Migration Crisis:** The global refugee and migration crisis has exposed vulnerable populations to risks, such as human trafficking, exploitation, and inadequate access to essential services.

- **Climate Change and Environmental Issues:** Climate change poses significant human rights challenges, including the displacement of populations due to natural disasters and the impact on the right to life, health, and a sustainable environment.
- **Challenges to Freedom of Religion and Belief:** In some regions, individuals and religious minorities face discrimination, persecution, and restrictions on their right to freedom of religion and belief.

Conclusion and Way Forward:
- As the world continues to face new challenges and human rights violations, the **principles mentioned in the Universal Declaration of Human Rights remain as relevant and necessary as ever.**
- Addressing these challenges **require serious efforts from governments, civil society, international organizations, and individuals.** It involves **promoting a culture of human rights, strengthening legal frameworks, improving access to justice etc.**

6.7   NEWS IN SHORTS

6.7.1   INDIA- EGYPT

- **Recently, the Prime Minister of India visited the state of Egypt.**
- India and Egypt signed an agreement to take the bilateral relationship to **"Strategic Partnership".**
- This strategic partnership will broadly focus on **4 areas:**
    - a) Political, defence and security
    - b) Economic engagement
    - c) Scientific and academic collaboration
    - d) Cultural and people-to-people contacts.
- **Three more Memorandum of Understanding (MoUs)** were also signed in fields of **agriculture, archaeology and antiquities and the competition law.**
- **PM Modi** was conferred with Egypt's highest state honour i.e.**'Order of the Nile'** award.
- During the visit, the PM visited **Al-Hakim mosque** (11th-century mosque in Cairo) which is an important cultural site for Dawoodi Bohra community.

6.7.2   75 YEARS OF UNITED NATIONS PEACEKEEPING

- Recently, the **75th anniversary of the beginning of UN Peacekeeping** was celebrated.
- Theme: **"Peace begins with me".**
- Basically, the United Nations Peacekeeping operations **began in 1948** and the **first peacekeeping mission was established on May 29, 1948,** when the United Nations

Security Council authorized the deployment of United Nations Peacekeeping forces **to monitor the ceasefire between Israel and its Arab neighbours after the Arab-Israeli War of 1948.**

- The '**Dag Hammarskjold medal**' was awarded to peacekeepers, who **died in 2022.**
- To recognize the services and sacrifices of UN peacekeepers, the **"Peace Begins with Me" campaign** was launched and this campaign **invites everyone to join the global movement for peace.**
- In the last almost 75 years, around **2 million peacekeepers have giver their services** to save and change lives in the world's most unstable regions.

6.7.3   INDIA-UN SDG COOPERATION FRAMEWORK

- Recently, the **Government of India-United Nations Sustainable Development Cooperation Framework (GoI-UNSDCF) 2023-2027** was signed between the NITI Aayog and the United Nations.
- This framework is an initiative of the **United Nations General Assembly (UNGA)** as the main planning and implementation instrument at the country level.
- This framework is in **harmony with India's national vision for development** and aims to achieve the Sustainable Development Goals (SDGs).
- GoI-UNSDCF 2023-27 is built upon 4 Strategic pillars and these are: **People, Prosperity, Planet, and Participation.**
- **These 4 pillars encompass 6 outcome areas:**
  a) Health and Wellbeing
  b) Nutrition and Food Security
  c) Quality Education
  d) Economic Growth and Decent Work
  e) Environment, Climate, WASH (Water, Sanitation, and Hygiene), and Resilient
  f) Empowering people, Communities, and Institutions

6.7.4 INTERNATIONAL CRIMINAL COURT (ICC)

- South Africa is thinking about legal options, if the Russian President (war crimes arrest warrant issued by the ICC on him) did attend the BRICS summit.
- **South Africa is a member of the ICC** and is legally bound to arrest Russian President, if he attends the summit.
- **Basically, the countries that have signed the Rome Statute have a legal obligation to cooperate.**
- ICC is an **independent, permanent international judicial institution** established to prosecute individuals for the most serious international crimes. These crimes include genocide, war crimes, crimes against humanity etc.
- It was **established on July 1, 2002,** when the **Rome Statute (formally known as the Rome Statute of the International Criminal Court) came into force.** The **Rome Statute was adopted on July 17, 1998,** during a diplomatic conference in Rome and has been ratified by many countries around the world.
- The ICC's jurisdiction extends to crimes committed on the territory of states that are parties to the Rome Statute, or by nationals of these states.
- Additionally, the **ICC can exercise jurisdiction when the United Nations Security Council refers a situation to the Court,** even if the alleged crimes were committed by nationals of non-party states.
- The ICC is an independent judicial body and is **not part of the United Nations system.** However, it maintains a cooperative relationship with the UN.

ICJ vs. ICC

	International Court of Justice (ICJ) La Cour Internationale de Justice (CIJ)	International Criminal Court (ICC) La Cour pénale internationale (CPI)
Year Court Established	1946	2002
UN-Relationship	Official court of the U.N., commonly referred to as the "World Court."	Independent. May receive case referrals from the UN Security Council.
Location	The Hague, The Netherlands	The Hague, The Netherlands
Types of Cases	Contentious between parties & Advisory opinions	Criminal prosecution of individuals
Subject Matter	Sovereignty, boundary, & maritime disputes, trade, natural resources, human rights, treaty violations, treaty interpretation, and more.	Genocide, crimes against humanity, war crimes, crimes of aggression
Funding	UN-funded.	Assessed contribution from state parties to the Rome Statute; voluntary contributions from the U.N.; voluntary contributions from governments, international organizations, individuals, corporations and other entities.

6.7.5 UNIVERSAL POSTAL UNION (UPU)

- Recently, the union government approved the establishment of a **regional office of the Universal Postal Union (UPU)** in **New Delhi**.
- UPU is a **specialized agency of the United Nations (UN) that coordinates and regulates international postal services among its member countries.**
- It was established in **1874** and is headquartered in **Berne, Switzerland.**
- It has a total of **192 member countries (including India).**
- The UPU is the **second oldest international organization worldwide**, after the International Telecommunication Union (ITU).
- UPU aims to ensure the **efficient exchange of mail and postal parcels between countries,** promoting global communication.
- It also promotes cooperation among its member countries to develop and improve postal services, standards, and technologies.
- **Its Universal Postal Congress is held every 4 years,** which brings together representatives from member countries to discuss and decide on postal matters, set the organization's strategy, and adopt new regulations.
- Between congresses, the **Council of Administration** manages the UPU's affairs and implements decisions taken by the congress.

6.7.6 ASIA-PACIFIC PLANT PROTECTION COMMISSION (APPPC)

- **Recently, the APPPC elected India as the chair of standing committee on Integrated Pest Management (IPM) for the year 2023-24.**
- APPPC is an **intergovernmental organization** that **focuses on plant protection and plant health in the Asia-Pacific region.**
- The commission was established in **1956** under the **Food and Agriculture Organization (FAO) of the United Nations.**
- The primary goal of the APPPC is to **promote cooperation among its member countries** in safeguarding plant resources from pests and diseases.
- The commission serves as a platform for member countries to share information, expertise, and technologies related to plant protection, and to collaborate on regional initiatives and programs.
- A **total of 25 countries (including India) are members** and APPPC **meets at least once every two years.**

6.7.7 COMBINED MARITIME FORCES (CMF)

- Recently, the **UAE withdrew its participation from the CMF.**
- CMF is a **multinational maritime partnership (India also a member),** that focuses **on counter-narcotics, counter-smuggling, suppressing piracy etc.**
- It operates in areas such as **Red Sea, Gulf of Aden, Arabian Sea, Gulf of Oman, and the Indian Ocean.**
- It was established in **2001.**
- It's **Headquarter** is located in **Bahrain.**
- CMF is **commanded by a U.S. Navy Vice Admiral.**

6.7.8 NORTHERN SEA ROUTE

- Recently, the **Russia has announced to invest $24 bn to develop the Northern Sea Route.**
- The Northern Sea Route (NSR), or the Northeast Passage (NEP), **connects the eastern and the western parts of the Arctic Ocean.**
- Basically, the NSR **runs from the Barents Sea (near Russia's border with Norway) to the Bering Strait between Siberia and the Alaska.**
- **NSR lies entirely in the Arctic waters** and within **Russia's exclusive economic zone.**
- Due to **rapid climate change, NSR in Russia is becoming more accessible.** Usually, this route opens only for 2 months annually.

- This route **will lead to energy and time savings**, compared to the normally used route through Suez Canal. It is 1/3 of the distance as compare to old route which passes through the Suez Canal.
- Another benefit of this route is that the **Piracy risk is almost absent on this route due to harsh weather.**

7.   SOCIAL ISSUES

7.1   NEWS IN SHORTS:

7.1.1   MOSPI RELEASED THE NIF PROGRESS REPORT 2023

- Recently, the **Ministry of Statistics and Programme Implementation (MoSPI)** released the **Sustainable Development Goals (SDGs) National Indicator Framework (NIF) Progress Report 2023.**
- This report **tracks the progress** achieved so far at the national level in respect to **Sustainable Development Goals (SDGs).**
- Basically, the **United Nations General Assembly (UNGA) adopted the SDG** and to monitor the implementation of different SDG's**, Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) developed the Global Indicator Framework (GIF).**
- GIF indicators have some specific methodologies and data sources and presently, the **GIF has 248 indicators.**
- In India similar to GIF, the **NIF** was developed by the government in 2018 and it was aligned with the SDG global indicators.
- Presently, there are **284 indicators in the NIF.**
- In 2019, the Government of India framed the guidelines for the States/UTs regarding the formation of **State Indicator Framework (SIF)** in their respective States/UTs.
- SDGs are a **set of global objectives established by the United Nations (UN)** to address various social, economic, and environmental challenges faced by the world.
- The SDGs were adopted by world leaders in **September 2015** and aim to guide global development efforts until 2030.
- There are **17 SDGs** in total, each with specific targets to be achieved by 2030.
- These **goals encompass a wide range of issues** and the SDGs are **interconnected** and mutually reinforcing, recognizing the complex and interdependent nature of global challenges.
- They provide a framework for governments, businesses, civil society and individuals to work together and take actions that promote sustainability, equality, and the well-being of both people and the planet.

7.1.2   WEF RELEASED GGR-2023

- Recently, the **World Economic Forum (WEF) has released the Gender Gap Report-2023** in which **India has been ranked at 127 out of 146 countries in terms of gender equality.**
- India showed an improvement of around **1.5 percent points** and **jumped by almost 8 ranks** from its earlier rank of **135 in 2022.**
- If we go with the current rate of progress, it will take almost **131 years** to reach full parity.
- **Iceland with 91%** gender parity has remained on **top position. Norway with 88% got the 2nd rank and Finland with 86% ranked on 3rd.**
- The report mentioned that India has attained **better parity in the area of education enrolment** but it has reached only **36.7%** parity in the area of **'Economic Participation and Opportunity'** and **25.3%** parity in the area of **'Political Empowerment'.**
- **Gender Gap Report** is an **annual publication of the World Economic Forum (WEF)** that assesses the gender equality gap in various countries around the world.
- The report measures gender gaps across 4 key areas: **Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment.**

Gender gap

India jumped eight spots to rank 127 in the Global Gender Gap Index, 2023. A look at how select countries fared

Rank	Country	Score	Rank change
1	Iceland	0.912	-
2	Norway	0.879	+1
59	Bangladesh	0.722	+12
103	Bhutan	0.682	+23
107	China	0.678	-5
115	Sri Lanka	0.663	-5
116	Nepal	0.659	-20
127	India	0.643	+8
142	Pakistan	0.575	+3

7.1.3   GLOBAL SLAVERY INDEX 2023

- Recently, the **Walk Free (international human rights group) released the Global Slavery Index 2023,** in which it alleged that **G20 countries including India are fuelling modern slavery.**
- The index has done the **assessment** of modern slavery conditions in almost **160 countries.**
- This index uses the data released by **International Labour Organisation (ILO), Walk Free, and International Organisation for Migration (IOM).**
- The term **"Modern slavery"** refers to the situations of exploitation that a **person cannot refuse or leave because of threats, violence, coercion** etc. It's a broad term that comprises various instruments of repression.
- The index claimed that almost **50 million** people were living in modern slavery on any given day in **2021** and it's an increase of almost **10 million** people since **2016.**

- In these 50 million people, **around 28 million** people suffer from **forced labour** and **22 million from forced marriages.**
- In all 160 countries assessed, **India tops the list with almost 11 million people working as forced labourers, followed by China, Russia.**
- **North Korea followed by Eritrea** has **highest prevalence** and **Switzerland followed by Norway have lowest prevalence of modern slavery.**
- Biggest factors responsible for slavery are **climate degradation, gender inequality, COVID-19, and conflict.**
- **Recommendations are:**
  a) Strengthen social protection and safety nets to boost resilience.
  b) Repealing migration policies that place national security above human rights.

7.1.4   UNHCR REPORT ON FORCED DISPLACEMENT

- Recently, a report was released by the **United Nations High Commissioner for Refugees (UNHCR)** which **revealed that the year 2022 witnessed a high increase in the number of people displaced** from their homes due to social and climate crisis.
- As per the report, the number of people who were forced to leave their homes due to reasons like persecution, conflict, violence, human rights violations and events seriously disturbing public order reached a record high of **108 million** by the end of the year 2022.
- Report also mentioned that almost **30% of them were children.**
- The data of 2022 shows an **increase of almost 19 million people compared to the year 2021.**
- **Out of the global total of 108 million** forcibly displaced people, almost **35.3 million** were **refugees** (people who crossed an international border to find safety). Basically, the forced displacement can be internal as well as external, depending on whether the displaced people remain within their country of origin or cross an international border.
- The **biggest reason** for displacement in 2022 was the **war in Ukraine**, which started in February 2022 and created one of the largest displacement crisis, since World War II.
- Other conflicts also added to the forced displacement across the world, such as the **crisis in the Democratic Republic of the Congo (DRC), Ethiopia and Myanmar,** where almost 1 million people were displaced within each country.

- Presently, the situation has even worsened as the **number of people displaced across the world increased to 110 million in May 2023, due to fresh conflict in Sudan.**
- Other than the conflict and violence, the **climate change and natural disasters** has also **given a push to displacement.**
- Almost **90%** of the displaced population **originated from Low- and middle-income countries.**
- Statelessness further increased the challenges faced by these refugees as they are not able to get even the basic necessities like healthcare, education, and employment.
- Almost **4.4 million** people in the world **were stateless or of undetermined nationality in 2022** and is a 2% increase from the year 2021.

Recommendations of the index are:
- Durable solutions like **voluntary repatriation and resettlement in a third country** can be done in a phased manner.
- To **enhance refuges self-reliance** by building their capacities and ease pressure on host countries.
- Through **local integration** of the refugees can build new lives in host countries.
- **Ensuring Safety and security of internally displaced people** and provide them better access to livelihood.
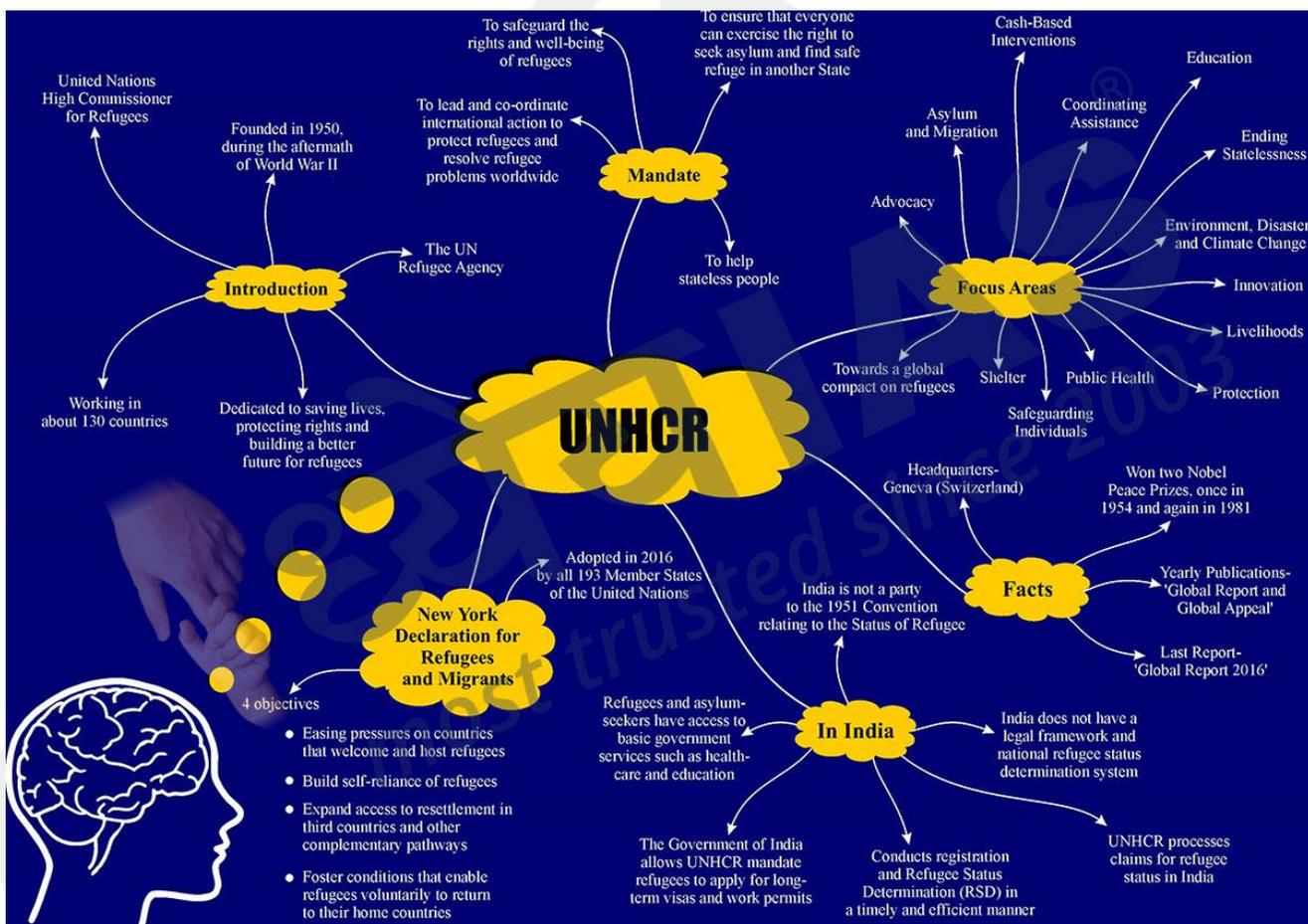

7.1.5   UGC (INSTITUTIONS DEEMED TO BE UNIVERSITIES) REGULATIONS, 2023

- Recently, the **Ministry of Education (MoE)** released **UGC (Institutions deemed to be universities) Regulations, 2023.**
- These new regulations **will replace UGC (institutions deemed to be universities) Regulations 2019** and will encourage universities to focus on quality & excellence, strengthen research ecosystem and transform higher education landscape.
- Earlier, the regulations were notified in **2010** and was revised in **2016** and **2019.**

Features of new regulations are:

- UGC Regulations, 2023 are aligned with **National Education Policy, 2020.**
- Any sponsoring body managing cluster of institutions can apply for **Deemed to be University (DtbU) status.** An institution of higher education, other than a university, doing the work of high standard in a specific area **can be given Deemed to be University status (DtbU).**
- Institutions given DtbU status may start new courses or programs in any field, with prior approval of its Executive Council.
- Institutions DtbU shall compulsorily create **Academic Bank of Credits (ABC)** identities of their students and should upload their credit scores in digital lockers.
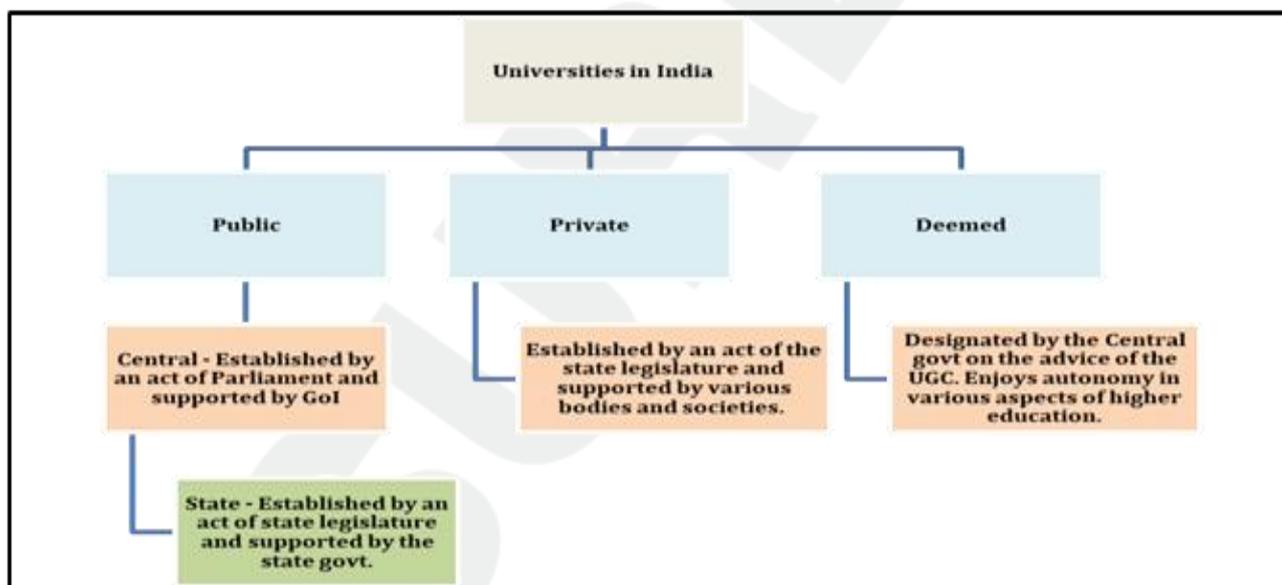
7.1.6 WORLD DRUG REPORT, 2023

- Recently, the **UN Office on Drugs and Crime (UNODC) released World Drug Report, 2023.**
- The **UNODC is a UN body** which **works to fight against illicit drugs and international crime**. It's **headquarter** is located in **Vienna.**
- It provides technical assistance, research and other support to member countries.

Some Key findings of the report are:

- Observed a **23% increase in the previous decade in the number of people using drugs** (296 million) globally.
- There is a **45% increase in the past decade of people suffering from drug use disorder** (39.5 million).
- **Inequality and social and economic disparities** continue to be the **major reason for drug abuse.**

- Disparities between the global North and South, urban and rural settings, and across subpopulations all contribute to the harm from drugs.

7.1.7   INDIA RANKINGS 2023 OF HEIS

- Recently, **8ᵗʰ edition of India Rankings of Higher Educational Institutions (HEIs)** was released by the **Ministry of Education (MoE).**
- These rankings are **based on National Institutional Ranking Framework (NIRF).**
- NIRF includes **5** broad parameters and these are:
  a) Teaching;
  b) Learning and Resources;
  c) Research and Professional Practice;
  d) Graduation Outcome;
  e) Inclusivity and Outreach
- The 2023 edition of India Rankings introduced a new subject namely **"Agriculture & Allied Sectors".**
- It also included rankings based on **"Innovation",** which was **previously done by Atal Ranking of Institutions on Innovation Achievements (ARIIA).**
- Expansion of scope of **"Architecture" to "Architecture and Planning"** was also done in this year's ranking.
- **IIT Madras topped in 'Overall Category' followed by Indian Institute of Sciences.**

INDIA RANKINGS 2023
National Institutional Ranking Framework
Ministry of Education, Government of India

Overall

Institution	Rank
Indian Institute of Technology Madras	1
Indian Institute of Science, Bengaluru	2
Indian Institute of Technology Delhi	3
Indian Institute of Technology Bombay	4
Indian Institute of Technology Kanpur	5
All India Institute of Medical Sciences, New Delhi	6
Indian Institute of Technology Kharagpur	7
Indian Institute of Technology Roorkee	8
Indian Institute of Technology Guwahati	9
Jawaharlal Nehru University, New Delhi	10

8.   CULTURE

8.1 CHOLA ADMINISTRATION

Latest Context

Recently, the **Sengol or sceptre** was presented by the head **of Thiruvaduthurai Adheenam (monastery)** to Prime Minister (PM) for placing it in the new Parliament building.

More Information

- **Pandit Jawaharlal Nehru**, the first Prime Minister of India, received the 'Sengol' as a **symbol of the transfer of power** to the government from the specially arrived priests from the Thiruvaduthurai Adheenam in Tamil Nadu on August 14, 1947.

- As far as the origin of the word 'Sengol' is concerned, it is derived from the Tamil word **'Semmai'** means **'righteousness'**. As an observer of 'Justice', the hand-engraved Nandi sits atop it, watching with his unflinching gaze. It reminds the recipient that he has the **"aanai"** (**order or decree**) to rule justly and fairly.

  o In Tamil culture, Sengol had **an important place**. When a new king is crowned, during the coronation by the high priest he would be presented with a 'Sengol' as a symbol of transfer of power.

  o In the Chola Empire, Sengol was considered **a symbol of the path of duty**, **the path of service, and the path of the nation**. According to Historians, handing over a sceptre to King shows the transfer of power that was the practice for nearly 2,000 years since the Sangam Age and it finds mention in texts such as **Purananooru, Kurunthogai**, **Perumpaanatrupadai**, and **Kalithogai**

  o **Chola Administration**

    ✓ In Chola Kingdom, King was the supreme authority therefore he had complete power although he was guided by a council of ministers. **Top authorities** were known as **Peruntaram** while the inferior officials were known as **Siruntaram**.

> **Thiruvavaduthurai Adheenam**
> - **in 16th century**, **a Saivite saint and scholar,** Namasivaya **Murthy** established this Math.
> - This Math had outstanding scholars in **Tamil** and **Saivite philosophy**.
> - Heads of Math were **also patrons of Tamil scholars** and **musicians**.
> - **Thirumoolar, Siddhar** and one of the **Saivaite saints** and author of **Thirumanthiram**, attained enlightenment under a Peepal tree in Thiruvavaduthurai.
> - Math is on the southern banks of river Cauvery

> **Uthiramerur Inscriptions**
> - They belong to the period **920 A.D** in the reign of **Parantaka Chola-I** (907-955 AD).
> - It is an **ancient Chola village** that was known as **Chaturvedimangalam** and was located near Chennai in Tamil Nadu.
> - According to Uthiramerur inscriptions, Chola Kudavolai Election System, every village was categorised as **kudumbu** (**a ward in modern day parlance**) where representatives of general assembly were elected.
> - Provide details of the way in which the sabha was organised.
> - The Sabha had separate committees to look after irrigation works, gardens, temples, etc.

- ✓ Chola empire was divided into **mandalams** or **provinces** and these areas, in turn, were divided into **Valanadu** and **Nadu**. More often than not, members or princes of the royal family were appointed as the governors of provinces.

- ✓ One of the most important features of the Chola administration is that it **encouraged local self-government** in the villages all over their empire. In many inscriptions such as **Uthiramerur Inscriptions**, two assemblies, **Ur** and the **Sabha or Mahasabha** were mentioned many times. **General assembly of the village** was known as Ur. **Mahasabha** was a **gathering of adult men** in **brahmana villages** which were called **agraharas**.

> **Categories of Land**
>
> - **Vellanvagai**: Land of non-Brahmana peasant proprietors
> - **Brahmadeya**: Land gifted to Brahmanas
> - **Shalabhoga**: Land for the maintenance of a school
> - **Devadana, tirunamattukkani**: Land gifted to temples.
> - **Pallichchhandam**: Land donated to Jaina institutions.

- o In Chola Kingdom, villages enjoyed a **large measure of autonomy**. The **affairs of villages** were managed by an **executive committee** of which educated persons who owned property were elected.
- o In Chola Kingdom, significant attention was paid to irrigation. For this purpose, River Kaveri and other rivers were used. Many tanks and wells for irrigation were built.
- o Chola rulers **drew their income** from **tolls on trade, taxes** on **professions i**n addition to land tax.
- o Chola kings were granted some rich landowners titles like **muvendavelan** (a velan or peasant serving three kings), **araiyar (chief)**, etc. Brahmanas often received land grants or **brahmadeya**.
- o Cholas had an **efficient army and navy**. The Chola army contained elephants, cavalry and infantry. **Rajaraja's son Rajendra I** developed **a navy** for **his expeditions** in the Ganga valley, **Sri Lanka** and **countries of Southeast Asia**.

Conclusion

Cholas will be remembered as one of the longest-ruling dynasties in the southern regions of India. It witnessed the onset of a new culture and the flourishing of art like never before. Their period is marked by a memorable period of medieval history that saw massive cultural growth along with a growth in civilization and its meaning. It symbolizes not only a period of rapid advancement but also a magnificent time to look back at and learn from.

8.2   GEOGRAPHICAL INDICATION TAG

Latest Context:

Recently, 7 new products from Uttar Pradesh (UP) got the Geographical Indication (GI) tag.

Products that got GI tag are:

- **Sambhal Horn Craft:** It include handicraft products which are made from horns procured from dead animals making it environment and animal friendly.

- **Baghpat Home Furnishings:** It includes cotton handloom bedsheets, curtains, cushions etc which are known for traditional geometric patterns.
- **Kalpi Handmade Paper:** They are manufactured in an eco-friendly manner using various types of paper scraps.
- **Mahoba Gaura Patthar Hastshilp**: Durable stone craft made of radiant coloured and off-white stone, Gaura.
- **Amroha Dholak:** It's a musical instrument that is made of natural wood having hollow blocks fitted with animal skin, mostly with goatskin.
- **Mainpuri Tarkash:** They are known for its fine inlay work with brass wire, strips and motifs on dark sheesham extensively for furniture and boxes and mainly used for khadaous (wooden sandals).
- **Barabanki Handloom**: The main products are scarfs, shawls and stoles.

About the Geographical Indication (GI) tag
- It is a **form of intellectual property protection** granted to products that originate from a specific geographical region and possess qualities, reputation, or other characteristics that are attributable to that location.
- It is **designed to protect the rights of producers** and prevent others from using the geographical indication to market inferior or counterfeit products.
- A GI tag is typically **granted by a competent authority or regulatory body** designated by the government of a country. The authority assesses the product's connection to the specific geographic region and determines whether it meets the criteria for the GI tag. Once granted, the GI tag indicates that the product has certain unique qualities or characteristics that are derived from its geographical origin.
- It also helps consumers **identify and purchase products that are genuine and associated with specific geographic regions** known for their quality, heritage, or traditional production methods.
- The authority responsible for granting the GI tag usually monitors and enforces compliance to maintain the integrity and reputation of the geographical indication.
- In India, the Geographical Indication (GI) tag is governed by the **Geographical Indications of Goods (Registration and Protection) Act, 1999.**
- The Act provides for the registration and protection of GIs for goods that have a specific geographical origin within India and possess certain qualities, reputation, or characteristics attributable to that origin.
- Notable examples of products in India that have received GI tags include **Darjeeling tea, Kashmir Pashmina, Kanchipuram silk sarees, Alphonso mangoes, Nagpur oranges,** and many more.
- Initially, the GI Tag is **valid for 10 years**, after which it can be renewed for another 10 years.

The registration process for a GI tag in India involves several steps:
- **Application:** The producer or any association of producers, organizations or authorities representing the interest of the producers of the concerned goods can apply for a GI tag. The application is made to the Geographical Indications Registry, which is under the control of the Controller General of Patents, Designs, and Trademarks.
- **Examination:** The Registry examines the application to ensure it meets the requirements for registration. This includes verifying that the goods have a specific geographical origin and possess distinct qualities or characteristics associated with that region.

- **Publication:** If the application is accepted, it is published in the Geographical Indications Journal to allow for opposition from interested parties. Any person can file an opposition within the specified period.
- **Registration:** If no opposition is filed or if the opposition is resolved in favour of the applicant, then the GI tag is granted and the geographical indication is registered. The registration provides legal protection to the GI and the producers associated with it.

JOINED BY BORDERS, DIVIDED BY CULTURES

Having got GI tags for 34 products, Karnataka has the most number of registrations, followed by Maharashtra (26) and Odisha (23)

8 JAMMU AND KASHMIR| (Kashmir pashmina, Kashmir sozani craft)

6 HIMACHAL PRADESH (Chamba rumal, Kangra painting)

1 DELHI Basmati rice

2 PUNJAB (Basmati rice, phulkari)

2 HARYANA (Basmati rice)

9 RAJASTHAN (Blue pottery of Jaipur, kathputlis of Rajasthan, Bikaneri bhujia)

5 MADHYA PRADESH (Bagh prints of Madhya Pradesh, Chanderi sarees)

10 GUJARAT (Gir kesar mango, Patan patola, Kutch embroidery)

26 MAHARASHTRA (Nagpur oranges, Nashik Valley wine, Solapur chaddar)

1 GOA (Fenni)

34 KARNATAKA (Byadgi Chili, Mysore silk, Mysore sandal oil)

22 KERALA (Aranmula kannadi, Malabar pepper, brass broidered coconut shell craft of Kerala)

2 UTTARAKHAND (Uttarakhand tejpatta)

17 ANDHRA PRADESH (Banaganapalle mangoes, Tirupathi Laddu, Andhra Pradesh Leather Puppetry)

21 UTTAR PRADESH (Banaras Brocades and Sarees, Lucknow Chickan craft, Firozabad Glass work)

1 SIKKIM (Sikkim large cardamom)

14 WEST BENGAL (Darjeeling tea, Bangalar rasogolla, Gobindabhog rice)

4 BIHAR (Sikki grass craft, Bhagalpur silks)

3 CHHATTISGARH (Bastar Dhokra, Bastar Wooden Craft)

22 TAMIL NADU (Kancheepuram silk, Thanjavur paintings, Swamimalai bronze icons)

In circle: No. of products that have been GI tagged

4 ASSAM (Muga silk of Assam, Assam tea)

3 NAGALAND (Naga mircha, Naga tree tomato)

4 MANIPUR Shaphee lanphee

1 MIZORAM (Mizo chilli)

1 TRIPURA (Tripura queen pineapple)

2 MEGHALAYA (Khasi Mandarin, memong narang)

23 ODISHA (Orissa Ikat, Orissa pattachitra, Pipili applique work)

9 TELENGANA (Hyderabadi haleem, Pochampally Saree)

WHAT IS A GI TAG?
- A GI tag is a geographical indication of an item which is specific to a particular place
- GI status can be sought for agricultural products, handicrafts, handloom and food products
- The RGI (registration of geographical indications) logo given to a particular product can only be used by registered and authorised users
- When marketed, a GI tagged product must carry a logo showing its place of origin
- Civil and criminal proceedings can be initiated against those using the logo in unauthorised manner

HOW TO APPLY?
- An association or collective body can apply to GI Registry
- Application should be backed by proof of uniqueness, historical records to show proof of origin, quality and special character
- After rounds of verification, presentation and meetings, if registry is satisfied, application goes to GI Registry journal
- If application receives no opposition within four months, it gets the GI tag

The Geographical Indication (GI) tag offers several benefits to producers, consumers, and the geographical regions associated with the products. Some of the key benefits are:
- **Legal Protection:** Obtaining a GI tag provides legal protection to the producers by granting them exclusive rights to use the geographical indication for the registered goods. It prevents unauthorized use of the GI by others, protecting the reputation and market value of the product.
- **Market Advantage:** Products with GI tags often enjoy a marketing advantage due to their unique association with a specific geographical region. The GI tag helps create a distinct identity and builds consumer trust, leading to increased demand and market recognition.
- **Quality Assurance:** GI tags are typically associated with specific qualities, attributes, or production methods that are unique to a geographical region. The tag assures consumers that the product possesses the desired characteristics and meets specific quality standards. It helps in maintaining consistency and ensuring the authenticity of the product.

- **Preservation of Traditional Knowledge and Practices:** GIs play a crucial role in preserving traditional knowledge, craftsmanship, and cultural heritage. The GI system encourages producers to continue using traditional production methods, which helps safeguard traditional skills and techniques from being lost or forgotten.
- **Economic Development:** GIs can contribute to the economic development of a region by promoting local industries and boosting rural economies. They provide a platform for small-scale producers and artisans to showcase their products and gain access to wider markets, thereby generating employment opportunities and enhancing income levels.
- **Tourism Promotion:** GIs often attract tourists who are interested in experiencing and purchasing unique products associated with specific regions. The presence of GI-tagged products can enhance the tourism potential of a region, leading to increased footfall and revenue for local businesses.
- **Safeguarding Against Counterfeiting:** The legal protection offered by a GI tag helps combat counterfeiting and the sale of inferior products. It ensures that consumers are not deceived or misled by products claiming to be associated with a particular geographical origin but lacking the genuine qualities or characteristics.

Conclusion

Overall, the GI tag **serves as a valuable tool for the protection, promotion, and development of unique products tied to specific geographical regions.** It benefits producers, consumers and the local communities by preserving traditional knowledge, enhancing market opportunities and promoting sustainable economic growth.

8.3 REMEMBERING CHHATRAPATI SHIVAJI MAHARAJ'S LEGACY

Latest Context:
Recently, the Indian Prime Minister commemorated the 350th year of Chhatrapati Shivaji Maharaj's Coronation Day.

More about news:
- PM highlighted the significance of this historic event in the context of India's present era.
- He emphasised that **Shivaji Maharaj's coronation symbolises a chapter of immense importance**, characterised by **self-governance, good governance and prosperity,** which continue to inspire the nation.
- Shivaji Maharaj's coronation also reminds us regarding the spirit of **Swarajya (self-rule) and nationalism**, with a strong focus on upholding the unity and integrity of the country.
- To honour this legacy, the Indian Navy replaced the flag

Timeline Of The Life Of Chhatrapati Shivaji
1. 19th Feb 1630: Born In The Fort Of Shivneri
2. Between 1645 & 1647: At 15, Conquered Forts Of Torna, Kondana & Raigarh
3. March 1657: Raided Mughal Territories Near Ahmednagar & Junnar
4. 10 November, 1659: Captured Satara After His Combat With Afzal Khan, Sultanate Of Bijapur
5. January 5, 1664: Raided Surat To Retaliate Against The Attack By Shaista Khan
6. June 11,1665: Signed Treaty Of Purandar With Jai Singh I.
7. June 11 ,1666: Put Under House Arrest By Aurangzeb, But Escaped Soon
8. 6 June, 1674: Crowned At Raighad Fort As The King.
9. 3 April, 1680: Died At Raighad, Leaving Behind A Rich Legacy

representing British rule with the **emblem of Shivaji Maharaj,** symbolising India's maritime pride.

About Chhatrapati Shivaji Maharaj (1627-1680)
- Also known as **Shivaji Bhosle** and he was the **founder of the Maratha Empire in the 17th century.**
- He was **born on February 19, 1630**, in the **Bhosle family in the fortress of Shivneri, near Pune**.
- He was born to **Shahaji Bhonsle,** a Maratha general who held the jagirs of Pune and Supe under the Bijapur Sultanate and **Jijabai,** a pious woman whose religious qualities had a profound influence on him.
- Shivaji was a **charismatic leader and a brilliant military strategist** who **established an independent Maratha state** by resisting the oppressive rule of the Mughal Empire and the Adil Shahi Sultanate of Bijapur.
- He is remembered for his **exceptional administrative skills, military reforms, and efficient governance.**
- He took on the titles of **Chhatrapati, Shakakarta, Kshatriya Kulavantas and Haindava Dharmodhhaarak.**

Some key highlights of Shivaji's life and achievements include:
- **Coronation:** Shivaji was **crowned as Chhatrapati (King) on June 6, 1674**, and he **adopted the title "Chhatrapati Shivaji Maharaj."**
- **Military Campaigns:** He carried out numerous military campaigns and is known for his guerrilla warfare tactics, which he used effectively to challenge larger and more powerful forces.
- **Naval Power:** Shivaji also **established a naval fleet**, which played a crucial role in securing his coastal territories and facilitating trade.
- **Administration:** He established a **well-organized administrative system** and encouraged various reforms to promote justice, welfare, and cultural development.
- **Tolerance:** Shivaji was **known for his religious tolerance** and treated people of all faiths with respect. He often adopted a policy of religious freedom and respected the diversity.
- **Forts and Architecture:** Shivaji was a **patron of architecture** and constructed several forts, including the famous Raigad Fort, which served as his capital. He also built various monuments and temples.
- **Legacy:** Chhatrapati Shivaji Maharaj's **legacy is remarkable in India.** He is **celebrated as a symbol of national pride and a hero of the Hindu resistance against the Mughal Empire.**

8.4 SHORT NEWS

8.4.1 UPNISHADS

- PM gifted the **first edition print of the book 'The Ten Principal Upanishads'** written by Indian and Iris scholar in **1937**, to the president of the United States.
- It was translated from Sanskrit into English and is considered one of the best-translated books in English. It is one of the most important Hindu religious texts.
- Upanishads, also known as **Vedanta** (which means the end of total Veda) speculate the ontological connection between humanity and the cosmos.
- They are dated to roughly **800-500 BC**. They laid emphasis on the relationship between the atman, the unchanging self of an individual, and Brahm, the ultimate reality in the universe.

- o **Ten main (or principal) Upanishads**: Mundaka, Mandukya, Taittiriya, Aitareya, Chandogya, Esha, Kena, Katha, Prashna, Brihadaranyaka.

8.4.2 RAJA PARBA

- **Raja Parba** or **Mithuna Sankranti** is a **3-day festival** celebrated **in Odisha**. The **term Raja** has derived its origin from the word **Rajaswala** (**meaning a menstruating woman**).
- During the **medieval period**, it became popular **as an agricultural holiday marking the worship of Bhudevi** the wife **of Lord Jagannath**. A silver idol of Bhudevi is still found in Puri Temple aside from Lord Jagannatha.
- Through this festival, womanhood is celebrated. It is believed that the Mother Goddess Earth undergoes menstruation during the first three days and makes herself ready for future agricultural activities with the arrival of monsoon.
- **Second day** signifies the starting of the **solar month of Mithuna** from which the season of rains gets started. It welcomes the **agricultural year** in Odisha.
- **Fourth day** is known as **Vasumati gadhua** or the **ceremonial bath of Bhudevi**. In the duration of the three days, women take a break from **household work** and play indoor games. Girls wear traditional saree and apply alatha on foot. All people abstain from walking barefoot on the earth.

8.4.3 AMBUWACHI MELA

- It is a **four-day annual fair** beginning at **Kamakhya temple located** atop the **Nilachal hills** in **Guwahati, Assam**. This festival is celebrated for marking the **annual menstruation of Goddess Kamakhya (reigning deity)**.
- Moreover, another reason to celebrate this festival is to promote awareness about menstrual hygiene.
- Kamakhya Temple is **one of the 52 Shakti peeths** or Seat of Shakti followers. This place is also considered one of the **prime seats** of **Tantric rituals**.

8.4.4 JOHA RICE

- Recently, scientists explored the **nutraceutical properties of Joha rice** (a **GI Tag rice from Assam**) and found **two unsaturated fatty acids**: **linoleic acid (omega-6)** and **linolenic (omega-3) acid**.
- It has a **more balanced ratio** of **omega-6 to omega-3** in comparison to the widely consumed nonscented variety. • It is a **short-grain winter paddy known** for its **significant aroma** and **taste**.
- Its varieties are **mostly short** or **medium-grained** and have very low yield potential. Joha Rice is very effective in **keeping blood glucose low** and **preventing diabetes**. In addition, it also has many antioxidants, flavonoids, and phenolics.

8.4.5 MENHIRS

- Enthusiasts of Heritage belonging to **Telangana** want to have a **UNESCO Tag** for **Menhirs** at **Mudumal village in Telangana**. They are **upright stones** and belong to **Megalithic period**. In General, they are erected **above a burial site** or **near a burial site** as a memorial.

- As per archaeologists, the menhirs have been designed in such a way that they align with the sun on particular days, like Equinoxes and solstices. Hence, by using menhirs, early agrarian people were enabled to chart the movement of the Sun.
- Understanding of Suns' movement enabled them to understand seasons.
    - o **As clocks and calendars,** they were also used. In addition, they were used to measure time, identifying specific days, months and seasons from the shadows.
    - o **Menhirs**
        - ✓ Mudumal village in Telangana is home to one of **South-East Asia's largest cluster of Menhirs**. They are as old as 3,500 years.
        - ✓ In local language, they are called **'Niluvu rallu'**- meaning standing rocks.
        - ✓ These are accompanied by **nearly 3,000 alignment stones** related to the funerary rights of the ancient community. These stones are arranged in lines or rows in a 20-25 feet gap.

8.4.6 HOMO NALEDI

- As per new evidence, Homo naledi is an **extinct human species** that may have buried their dead and carved out a meaningful symbol in a cave. They are older than any known Homo sapiens burials by at least 100,000 years.
- **Features of Homo naledi**
    - o They used to walk **fully upright** and **had hands** that **were similar to ours**.
    - o Shoulders were built for climbing and teeth were shaped like that of older primates.
    - o Their brain size was **just one-third** of that of **modern humans**.
    - o Earliest ancestors of Humankind: Homo habilis, Ardipithicines, Australopithecines, Homo ergaster/ erectus, Homo neanderthalensis, Denisovans.

8.4.7 PRESS INFORMATION BUREAU (PIB)

- **PIB** is marking its centennial anniversary.
    - o **About PIB:** It is a nodal agency of the Government of India for disseminating information to the print and electronic media on government policies, programs, etc.
    - o **Genesis**
        - ✓ It was set up as a **temporary cell** (under the British Government) in 1919. The bureau was made **permanent** in **1923** as the Bureau of Public Information.
        - ✓ In 1946, it acquired its present name and became a **department of the Ministry of Information and Broadcasting in 1947.**
    - o **Head:** It is headed by the **Principal Director General** (Media & Communication) who is supported by a Director General and **eight Director Generals.**
    - o **Functions:** There are basically **three kinds of activities** that come under its purview namely, **Information, Education & Communications; Feedback and Accreditation & Special Services**.

8.4.8   JATAN: VIRTUAL MUSEUM BUILDER

- **JATAN**: It is a **digital collection management system** for **Indian Museums** having **client-server application** features like unique numbering, image cropping, watermarking, and management of digital objects with multimedia representations.
- It has been **designed** and **developed** by **Human Centres Design and Computing Group, Centre for Development of Advanced Computing (C-DAC), Pune**.
- C-DAC is a top-notch R&D organization of the Ministry of Electronics and Information Technology (MeitY) for carrying out R&D in IT, Electronics and associated areas. It was established in 1988.
- It is part of the Central government's plan to **complete 3D digitisation** of all **museums** under its administrative control by the year-end for **better conservation of artefacts**.
- Presently, the Ministry of Culture has **10 museums** under its jurisdiction.
- In addition, the **Archaeological Survey of India** also has **site museums** at **44 locations** spread throughout the country in proximity to important archaeological sites
- **Partners:** Memorandum of Understanding has been signed between the **Ministry of Electronics and Information Technology** and the **Ministry of Culture**.

8.4.9   GANDHI PEACE PRIZE 2021

- Gandhi Peace Prize 2021 will be given to **Gita Press, Gorakhpur**.
- In 1995, **on the occasion of the 125th birth anniversary** of **Mahatma Gandhi,** the annual **Gandhi Peace Prize** was **instituted**.
- This award is open to **all persons** regardless of nationality, race, language, caste, creed or gender. It carries a **cash prize of ₹1 crore**, **a citation, a plaque,** and an exquisite traditional handicraft/handloom item.
- Past awardees comprise organisations such as **ISRO** and **Ramakrishna Mission**

8.4.10 SAHITYA ACADEMY AWARD

- Ministry of Culture is thinking to change the **nomination process** for **Sahitya Akademi Award**.
- It is a **literary honour**, conferred **annually on writers of most outstanding books** of literary merit published in any of the major Indian languages.
- Besides 22 languages enumerated in Constitution, **English and Rajasthani** languages are also **recognised**.
- It incorporates a **casket** containing an engraved copper plaque, a shawl and an amount of Rs. **1,00,000/**.
- Sahitya Akademi functions as **an autonomous organisation**. It is registered as **a society** under **Societies Registration Act, 1860**.

8.4.11 DIAMOND LEAGUE

- **Indian long jumper Murali Sreeshankar** achieved **third place** in **Paris Diamond League**.
- It is an **annual series** of **top-tier track** and **field competitions** organised by **World Athletics** which is the international governing body for athletics.
- It began in **2010** as a **replacement for previous IAAF Golden League** and **IAAF World Athletics Final events**.
- **Number of meets** in a **particular season** of Diamond League is generally **14**. The meets are held in different cities across the globe.

8.4.12 ICC WORLD TEST CHAMPIONSHIP (WTC)

- **Australia** won the WTC title by beating **India**.
- It contains the top **nine Test teams**. All teams played **six series,** three at home and three away. The top two teams competed in WTC Final.
- Each match was worth the same number of points this time rather than each series being worth the same number of points as in the first edition.
- Teams qualified on a **percentage of points** won to standardise the imbalance in the number of matches played by terms.

9. ETHICS

9.1 PATRONAGE APPOINTMENTS

Introduction

Patronage Appointments mean appointments which are made on the recommendation or source (personal connections) of an influential person, political leader, public servant, etc. Patronage appointments not only affected the people involved in the process but also affected the overall Governance of India.

Ethical Issues in Patronage Appointments

Motivations For Patronage Appointments
• Appointments are made in lieu of bribes or favors • Using Power to appoint individuals having personal relationships with the appointing authority. • These appointments are made in personal discretion in order to enhance influence in the governance system

- **Nepotism and Favouritism:** Patronage appointments often lead to the hiring of friends, family members, or political allies, even if they are not the most qualified candidates for the job. This undermines the principles of fairness and equal opportunity, as deserving individuals may be overlooked in favor of those with political connections.
- **Lack of Meritocracy:** Patronage appointments can compromise the merit-based selection process that is essential for ensuring that the most capable and skilled individuals are placed in positions where they can contribute effectively to the public good. This can lead to inefficient governance and negatively impact the quality of public services.
- **Corruption and Unethical Behavior**: The practice of patronage can foster a culture of corruption, as public officials may use their power to reward their supporters or secure loyalty from subordinates. This can lead to abuse of power, favouritism in decision-making, and the misuse of public resources for personal or political gain.
- **Erosion of Public Trust:** Patronage appointments can erode public trust in government institutions and processes. When citizens perceive that political connections matter more than qualifications, they may become disillusioned with the system and feel disconnected from the decision-making processes that affect their lives.
- **Inefficiency and Poor Governance**: Appointing individuals who lack the necessary skills or experience can lead to poor performance and inefficiency in public administration. This can hinder effective policymaking, hinder public service delivery, and hinder the overall development and progress of a nation or organization.
- **Diversion from the Public Interest**: Patronage appointments may prioritize the interests of the political elite and their allies over the broader public interest. This can lead to policies and decisions that benefit a select few at the expense of the larger population.
- **Negative Impact on Diversity and Inclusivity**: When patronage becomes the primary method of appointment, it can hinder efforts to promote diversity and inclusivity in public institutions. Merit-based systems, on the other hand, can help ensure that people from diverse backgrounds and experiences are given an opportunity to serve the public.

Effects of Patronage Appointments

- **Diminished Meritocracy**: Patronage appointments often lead to the placement of individuals who may not possess the necessary skills, qualifications, or experience for the position. This undermines the principles of meritocracy and can result in inefficient and ineffective governance.

- **Corruption and Nepotism:** The practice of patronage can foster corruption and nepotism, as politicians may appoint their allies, friends, or family members to key positions without considering their abilities or integrity. This can lead to a lack of transparency and accountability in public administration.

- **Reduced Public Trust:** When the public perceives that key appointments are made based on political favours rather than competence, it can erode trust in the government and public institutions. This can lead to citizen disillusionment and a decreased willingness to engage in the political process.

- **Incompetent Governance**: Patronage appointments may result in the placement of officials who lack the expertise to effectively manage public affairs. This can lead to poor decision-making, mismanagement of resources, and a decline in the quality of public services.

- **Weakened Institutions:** When positions are filled based on political allegiance rather than merit, it weakens the capacity and independence of public institutions. This can hamper their ability to carry out their functions impartially and effectively.

- **Adverse Economic Effects**: In cases where patronage appointments lead to the appointment of unqualified officials in critical economic roles, it can negatively impact economic policies and hinder sustainable development.

- **Political Polarization**: Patronage appointments can contribute to increased political polarization as they reinforce a system where loyalty to a particular party or group takes precedence over the common good or national interest.

- **Hindered Innovation and Progress**: When individuals are appointed based on political connections rather than expertise, it can stifle innovation and progress. Competent and innovative individuals may be overlooked in favour of those with political connections, leading to a lack of fresh ideas and perspectives.

- **High Turnover Rates:** Patronage appointments may result in a frequent turnover of personnel when political administrations change. This can lead to a lack of continuity and institutional memory, impeding long-term planning and policy implementation

Measures Taken to Curb Patronage Appointments

- **Right to Information (RTI) Act, 2005**: By this act, citizens are empowered to seek information from public authorities, including information regarding appointments and recruitments.

- **National e-Governance Plan (NeGP)**: Through this Plan, human intervention has been reduced and it brought about enhanced transparency and efficiency in the appointment process.

- **Whistleblower Protection**: The **Whistleblower Protection Act, 2014**, protects individuals who expose corruption and wrongdoing, including cases of patronage appointments.

- **Strengthening Anti-corruption Measures**: The government has set up specialized anti-corruption agencies like the Central Bureau of Investigation (CBI) and the Anti-Corruption Bureau (ACB).

- **Other Initiatives**: Prevention of Corruption Act, 1988, Lokpal etc

10. SCHEMES IN NEWS

10.1 SMART CITIES MISSION

Latest Context
Recently, the Government has decided to extend the `Smart Cities Mission deadline by one year from June 2023 to June 2024.

Objectives
- To promote cities to provide core infrastructure, a clean and sustainable environment through the application of 'smart solutions.
- To drive economic growth and improve quality of life through comprehensive work on social, economic, physical and institutional pillars of the city.
- To create replicable models which act as lighthouses to other aspiring cities.

Salient Features
- Since 2015, this scheme is operated as a **Centrally Sponsored Scheme** and will be extended till 2024 by the Ministry of Housing and Urban Affairs.
- **Smart City Features**
  - **Creating Walkable Localities** - air pollution and resource depletion, reduce congestion, boost the local economy, promote interactions, and ensure security.
  - Protecting and develop open spaces like parks, playgrounds, etc.
  - **Promoting a variety of transport options** — Transit Oriented Development (TOD), public transport and last mile para transport connectivity.
  - Promoting mixed land use in area-based developments.
  - Giving an identity to the city on the basis of its main economic activity, like local cuisine, health, education, etc.
  - Applying Smart Solutions to infrastructure and services in area-based development in order to make them better.
- It will cover **100 cities**.
- The **implementation** of the Mission at the City level will be done by a **Special Purpose Vehicle** (SPV) created for the purpose. It will plan, appraise, approve, release funds, implement, manage, operate, monitor and evaluate the Smart City development projects.
- The Smart City proposal of each shortlisted city is expected to encapsulate either a retrofitting or redevelopment or greenfield development model, or a mix thereof and a Pan-city feature with Smart Solution.
- **Funding**: The Central Government funded this mission to the extent of **Rs. 48,000 crores over 5 years (FY15-FY20)** i.e. on an average of Rs.100 crore per city per year.
  - **An equal amount** on a matching basis is to be provided **by the State/ULB**.

- o Additional resources are to be raised through convergence, from Urban Local Body (ULBs)' own funds, grants under Finance Commission, innovative finance mechanisms such as Municipal Bonds, other government programs and borrowings
- The emphasis has been given to the participation of the private sector through Public Private Partnerships (PPP).
- There is no standard definition or template of a smart city.
- **ICCCs (Integrated Command and Control Centers)** have been operationalized in all the **100 Smart Cities**, which have been envisaged to act as the brain and nerve centre of the enabling cities with a decision support system for enhancing the quality of life for its citizen.
    - o These ICCCs are playing a crucial role in **ensuring better monitoring and efficiency** in areas like traffic management, solid waste management, and water distribution management.
    - o Smart Cities have effectively used ICS and related Smart infrastructure for better management of the COVID-19 pandemic.

APPENDIX

KEY DATA AND FACTS

KEY POINTS OF THE SDG-NIF PROGRESS REPORT 2023

- **SDG 1: No Poverty**
  - **Progress Made by India**
    - ✓ In 2021-22, **33.98 Lakh Self-Help Groups (SHGs)** linked to Bank Credit
    - ✓ **1.20 Lakh Senior citizens** offered institutional assistance funded by the government in 2022-23.
    - ✓ India adopted and implemented **Sendai Framework for Disaster Risk Reduction**

- **SDG 2: Zero Hunger**
  - **3.9% Net Area** under Organic Farming
  - **Rs. 84, 921 gross values** added in agriculture per worker in 2022-23

- **SDG 3: Good Health and Well-Being**
  - **97 per lakh live births** was the **Maternal Mortality Ratio (MMR)** in 2018-20 (130 in 2024-16)
  - **32** was the **Under-Five Mortality Rate in 2020** (43 in 2005)
  - Commitment to eliminate **Tuberculosis by 2025**

- **SDG 4: Quality Education**
  - **Free and Compulsory Elementary Education** up to class 8.
  - **57.6** % was the Gross Enrollment Ratio (GER) in Higher Secondary Education (2021-22)
  - **27.30 %** was the GER for Tertiary education (2020-21)
  - **89.30 % of schools with** access to electricity (2020-21)

- **SDG 5: Gender Equality**
  - **14.36%** the **women's political participation** in **Parliament (Lok Sabha) in 2019**
  - **907 is the sex ratio at Birth** in 2018-20 (898 in 2014-16)
  - **92.7%** exclusive **women SHGs linked with the Bank** in 2012-22

- **SDG 6: Clean Water and Sanitation**
  - **100 %** rural households have access to toilet facilities (2019-2020)
  - **100% districts are Opend Defecation Free (ODF)** in **2019-20.**
  - **91% water bodies** had ambient water quality in 2021.

- **SDG 7: Affordable and Clean Energy**
  - **100%** households **electrified** in 2021-22.
  - **99.80 %** households using **clean fuel** in 2022-23
  - **22.5%** of total installed **electricity generation** is from **renewables** (2022-23).

- **SDG 8: Decent Work and Economic Growth**
  - **34,134 Patents** were issued in 2022-23 (6,326 in 2015-16)
  - **26,522 startups recognized** under Startup India Scheme in 2022 (428 in 2016)
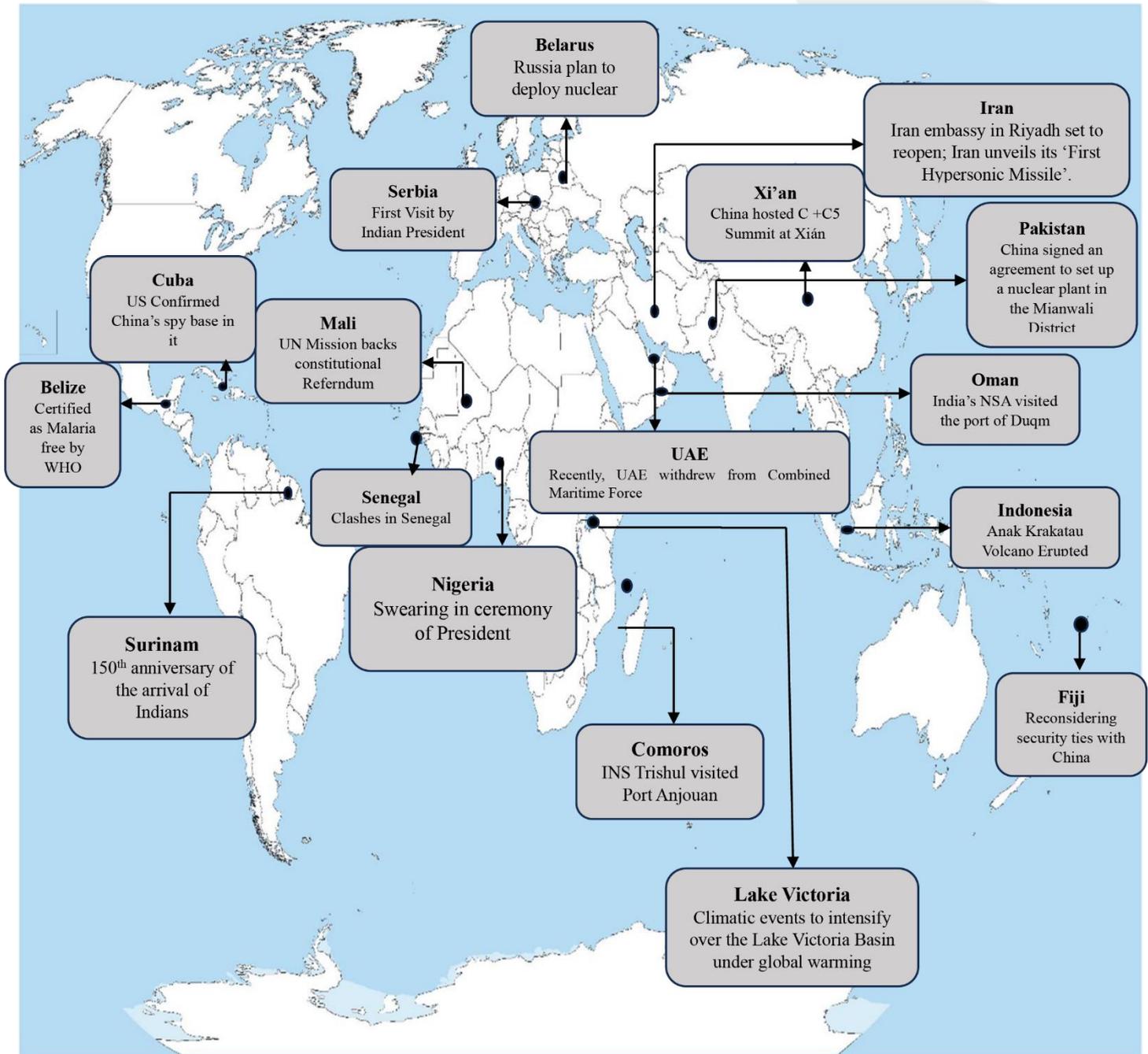 - **National Strategy for Youth Employment** operationalized.

- **SDG 9: Industry, Innovation and Infrastructure**
    - **59.97% Population** subscribed to the **Internet in 2022-23** (26.98 in 2015-16)
    - **50.65 tonnes per rupees crore CO_2 emission** in 2018-19 (61.45 in 2015-16)
    - **262 researchers per million population** in 2020-21 (218 in 2015-16)

- **SDG 10: Reduced Inequalities**
    - **14.36 % Members in the Lok Sabha** were women in 2019.
    - **2.10 % budget allocation to the north-eastern states** in 2022-23 (1.66 % in 2015-16)
    - **6.19% budget (2023-24)** allocated for welfare of **SCs, and STs**.

- **SDG 11: Sustainable Cities and Communities**
    - **98% wards achieved 100% door-to-door waste collection** service in 2022.
    - **76% waste processed** in 2023 (17.97% in 2016).
    - **24.76 was the injury rate** and **9.84 was the death rate** for road accidents in 2020.

- **SDG 12: Responsible Consumption and Production**
    - **187.7 kg per Capita food availability** in 2021-22 (176 Kg in 2018-19)
    - **6.81MT hazardous** waste generated per capita in 2020 -21 (7.19 in 2017-18)
    - India has ratified **environmental agreements for effective management of hazardous wastes and other chemicals.**

- **SDG 13: Climate Action**
    - **10,738.97 per lakh population** affected by **disasters in 2018** (14,743.14 in 2015)
    - **24 %** reduction in emission intensity of GDP over 2005 level.

- **SDG 14: Life Below Water**
    - **Rs 498.95 Crore budget estimates for** Ocean Services, Modelling, Application, Resources and Technology (**O-SMART**) **Scheme in 2022-23**.

- **SDG 15: Life on Land**
    - **21.71% forest cover of** total geographical area in 2021(21.35% in 2015)
    - **5.28% protected area** percentage of total geographical area in 2022
    - **8.69% of total wetland areas declared as Ramsar sites in 2022 (4.17% in 2016)**
    - **0.07%** of the total government expenditure on **environmental protection in 2021-22**
    - India has adopted a legislative, administrative and policy framework to secure **Fair and Equitable Sharing Benefits.**

- **SDG 16: Peace, Justice, and Strong Institutions**
    - **1.49 Judges per lakh** population in 2022.
    - **2.20 per lakh** population intentional homicide in 2021 (2.63 per lakh in 2015)
    - **National Human Rights Institutions compliant with international norms** set out in the Paris Principles.

- **SDG 17: Partnership for the Goals**
    - **25 states** using the state monitoring framework (12 in 2019-20)
    - **1.77% share of merchandise export** of total global export in 2021
    - **4.0% Commercial Service export** of total global export in 2021**.**

o **National Statistical Legislation** with compliance to UN
o **Fundamental Principles of Official Statistics**

PLACES IN NEWS: WORLD

Belarus
Russia plan to deploy nuclear

Iran
Iran embassy in Riyadh set to reopen; Iran unveils its 'First Hypersonic Missile'.

Serbia
First Visit by Indian President

Xi'an
China hosted C +C5 Summit at Xián

Pakistan
China signed an agreement to set up a nuclear plant in the Mianwali District

Cuba
US Confirmed China's spy base in it

Mali
UN Mission backs constitutional Referndum

Oman
India's NSA visited the port of Duqm

Belize
Certified as Malaria free by WHO

UAE
Recently, UAE withdrew from Combined Maritime Force

Indonesia
Anak Krakatau Volcano Erupted

Senegal
Clashes in Senegal

Nigeria
Swearing in ceremony of President

Fiji
Reconsidering security ties with China

Surinam
150th anniversary of the arrival of Indians

Comoros
INS Trishul visited Port Anjouan

Lake Victoria
Climatic events to intensify over the Lake Victoria Basin under global warming

PLACES IN NEWS: INDIA

Mahakaleswar Temple (MP)
PM of Nepal Offered Prayers at this temple located in Ujjain

Uhl River (Himachal Pradesh)
HP and Punjab to face off over ownership of Shanan project located on this river

Kamakhya Temple (Assam)
Ambubachi Mela started at Kamakhya temple located at the top of Nil Anchal

Delhi
Tomb-like Structure discovered at Siri Fort ; Restoration of **Khikri Mosque** initiated.

Sundargarh Forest Division (Odisha)
1. Proposal to declare Natural Arch as **Geo Heritage Site**
2. Jaganath Puri Rath Yatra Held

Lothal
Government to develop National Maritime Heritage Complex

Golcunda Fort
Ministry of Culture celebrated Telangana Formation Day at this fort

Raigad Fort
Celebrations of the 55th anniversary of the coronation of Shivaji Maharaj were started

OrvakalluVillage
Mesolithic Era painted discovered

Cochin Port (Kerala)
Center rolled out renovation of Cochin Port

Thiruvavaduthurai Math
Sengol or scepter presented by head of Thiruvavaduthurai Math

PERSONALITY IN NEWS

Ahilyabai Holkar

- **Introduction**
  - **Maharashtra Government** has decided to rename the **Ahmadnagar District** as **Ahilyanagar.**
  - She was an 18th century **Malwa queen.**
  - After the death of her husband Khande Rao in the **Battle of Kumbher** against the king of Bharatpur, she took control of **Malwa in 1754.**
- **Contribution**
  - She reigned her regime very effectively. She excelled in introducing several administrative and military strategies during her regime.
  - During her regime, the **city of Maheswar became a literary, musical, artistic, and industrial centre.** Moreover, she helped in establishing a textile industry in this city which has become famous for Maheswari Sari now.
  - She restored or revamped many temples like Kashi Vishwanath, Badrinath, Dwarka, Omkareshwari etc.
- **Ethical Values established by Her: Valour and Administrator**
  - She was a very brave queen, a highly efficient ruler, and had very sharp political traits.

Rani Durgawati

- **Introduction**
  - **Rani Durgawati Gaurav Yatra** was launched in **Madhya Pradesh.**
  - She belonged to **Mahoba's Chandela dynasty and** was married to **Dalpat Singh** of **Gond Kingdom of Garha-Katanga.**
  - She built up **several reservoirs** such as Ranital, Cherital, and Adhartal.
  - She permitted **Acharya Bitthalnath** to establish a **seat of Pushtimarg Cult at Garha.**
  - **She** repulsed **Baz Bahadur, rule of Malwa** between 1555 and 1560.
  - She was defeated by the ruler **Mughal governor** of Allahabad **Asif Khan**
- **Ethical Values established by Her: Self-Determination**
  - She exhibited a strong sense of self-determination by reigning his husband's regime after his death.
  - She did not waste her time in mourning or grief when her husband died. She chose to lead and governed her husband's kingdom.

Savitribai Jyotirao Phule

- **Introduction**
  - She was a prominent **social reformer, educationist, and poet.**
  - She was responsible to establish the **first girl's school** in **Pune** with her husband Jyotirao Phule.
- **Contribution**
  - She did a lot of efforts for **educating, emancipating child marriage,** and **sati pratha** and advocated **widow remarriage**
  - She began the **Mahila Seva Mandal.** In addition, she started a care centre called **'Balhatya Pratibandhak Griha'.**

o She was associated with a **Social Reform Society** called '**Satyashodhak Samaj'** founded by Jyotirao in 1873.
- **Ethical Values Exhibited by Her: Rationalism and Social Justice**
  o She had a strong belief in a scientific understanding of Indian history, especially with the origin of caste-based society order.
  o She played a vital role in women's education in India.

Prashanta Chandra Mahalanobis
- **Introduction**
  o National Statistics Day (29 June) is celebrated every year in recognition of contributions made by Prashant Chandra Mahalanobis in the realm of statistics and economic planning.
- **Contribution and Achievements:**
  o He is often referred to as the father of **Indian Statistics.**
  o He was one of the members of the first **Planning Commission of India** and founded the **Indian Statistical Institute**.
  o He discovered a **Mahalanobis distance,** a statistical measure that is used to find the distance between a point and a distribution.
- **Ethical Values Exhibited by Him: Institution Builder and Scholarship**
  o He was a very brilliant statistician and scientist whose scholarly contribution led to the development of large-scale surveys undertaken for policy making in India.

Shankar Trimbak Dharmadhikari
- **Introduction**
  o He was popularly known as **Dada Dharmadhikari.** He was **a freedom fighter and Gandhian thinker.**
- **Contribution**
  o **Political**
    ✓ He participated in **Non-Cooperation Movement (NCM)** and **Quit India Movement** (QIM)
    ✓ He was an active member of **Gandhi Seva Sangh.**
    ✓ He was elected to **Madhya Pradesh Legislative Assembly** and the Constituent Council.
- **Contribution**
  o **Social**
    ✓ He devoted his whole life to the upliftment of the Dalits and women.
    ✓ He advocated for an **ideological revolution.** In addition, he was closely associated with **Vinobha Bhave** and participated in **Bhoodan Movement.**
- **Ethical Values Exhibited by Him: Social Justice and Equality**
  o He played a crucial role in the advancement of Dalits and women. He devoted his whole life for fighting for the rights of downtrodden section of the society.

Birsa Munda
- **Introduction**
  o The PM recently paid tribute to **tribal icon Birsa Munda** on **123rd death anniversary**.
  o He belonged to the **Munda tribe** in the **Chhotanagpur Plateau area.**
  o He converted to Christianity for joining the **German Mission School.**
  o He started the **faith of 'Birsait'**

- **Contribution**
  - He refused to **follow colonial laws** and pay rent; he **challenged religious practices to fight against superstition.**
  - In the **Ulgulan movement of 1899 guerrilla warfare** was started for throwing out foreigners.
  - He became known as '**Bhagwan (God)** and '**Dharti Aba' (**Father of Earth) by his followers.
- **Ethical Values Exhibited by Him: Fortitude and Vision**
  - He played a very effective role in the liberation of his community.
  - He was one of the most courageous tribal leaders who led a revolt of his tribesman against British rule and powerful landlords.

Swami Sahajanand Sarswati
- **Introduction**
  - He was born in **Ghazipur, Uttar Pradesh.**
- **Contribution**
  - He played a crucial role in raising the consciousness of the farmers by organizing them against British rule in Freedom Movement.
  - He became the **1st President** of the **Kisan Sabha** that was formed in **April 1956** at the Congress Session in Lucknow.
  - He organized **Bakasht movement** in **Bihar** against zamidars evicting tenants from Bakasht lands that led to the **Bihar Tenancy Act** and **Bakasht Land Tax** to protect farmers'rights.
  - He also led a **successful revolt** in the **Dalmia Sugar Mills** at **Bihta** where peasant-worker unity was the most powerful characteristic.
- **Ethical Values Exhibited by Him: Community Development and Selfless Service**
  - He promoted Khadi and prohibition as a means of empowering and self-sustaining local communities.
  - He dedicated his whole life for the political and economic independence of the Indian People.

Harry Markowitz
- **Introduction**
  - Harry Markowitz, father of **Modern Portfolio Theory (MPT), recently passed away.**
  - He shared the **Nobel Prize in Economic Sciences (1990)** with Merton H.Miller William F. Sharpe for his ideas on finance
- **Contribution**
  - MPT is a **practical method for selecting investments** in order to **maximize their overall returns** within an **acceptable level of risk.** He laid emphasis on **combinations of assets** rather than individual securities. He also did remarkable work in **mathematical programming** and **computer simulations**
  - He also **developed Simscript,** a language used to write simulation software.
- **Ethical Values Exhibited by Him: Perseverance and Rationality**
  - He forwarded the understanding of portfolio management and fostered a culture of evidence-based decision-making and continuous learning.