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GS 1 : Heritage, culture ,Geography of the World and Society

1. Fujiwhara Effect: When cyclones dance

- In the ever-changing tapestry of Earth's climate, the Fujiwhara effect has emerged as a captivating and consequential phenomenon.
- With cyclones intensifying due to global warming, this intricate 'dance' between cyclones is garnering attention.

- **Surprising Weather:** Recently, a storm named Hurricane Hilary brought a tropical twist to the US west coast. It's part of a series of odd weather happenings there.
- **Wet Weather:** Earlier this year, California had an unexpected rainy season with lots of wet storms, called 'atmospheric rivers.'
- **Fujiwhara Show:** During one of these storms, something special occurred—an effect named after a scientist. Let's dive into the details.

Decoding the Fujiwhara Effect

- **Cyclone Waltz:** Imagine two cyclones (or big storms) spinning in the same direction. When they get close, they begin a kind of dance around a common center.
- **Outcome of the Dance:** Depending on the strength of the cyclones, they might merge, spin together, or one might absorb the other.
- **Super Cyclone:** Rarely, if both cyclones are super strong, they can become one mega cyclone that causes big trouble.

Historical Context and Impact

- **Origins and Discovery:** The Fujiwhara effect got its name from a Japanese scientist who first talked about it in 1921. It was seen happening for real in 1964.
- **Effects Unleashed:** This unusual dance can be fierce. It has caused strong winds, broken windows, and power problems in some areas.
- **Guessing Game:** The Fujiwhara effect is tricky for weather experts. It's hard to predict what will happen when two cyclones dance together.

Climate Change Connection

- **More Frequent Moves:** The Fujiwhara effect is showing up more often now. Experts believe it's because our world is getting hotter and ocean waters are warming up.
- **Hotter Waters:** Because of global warming, storms are getting stronger. For instance, in Taiwan, typhoons have become 35% stronger since 1977 due to warmer oceans.

Implications

- **Nature's Symphony:** The Fujiwhara effect is like a nature's concert, showing us how everything is connected in our climate.
- **Future Twist:** As storms get more powerful, the Fujiwhara effect could become even more important and harder to understand.
- **Planet's Dance:** The Fujiwhara effect teaches us about our planet's rhythm and how important it is to take care of our home.

2. Urban Flooding

Due to climate change, urban population growth there has been increase in the urban flooding.

Urban flooding

- The flooding of land or property in a built environment, especially in densely populated cities where rainfall exceeds capacity of drainage system is known as urban flooding.
- It is a man-made disaster which is caused not only by higher precipitation but also by unplanned urbanization.
- Urban flooding is significantly different from rural flooding as urbanization leads to developed catchments, which increases the
    o Flood peaks from 1.8 to 8 times and
    o Flood volumes by up to 6 times

Status of urban flooding in India

- There has been an increasing trend of urban flood disasters in India over the past several years whereby major cities in India have been severely affected.
- **Special feature in India**
    o Heavy rainfall during monsoons
    o Storm surge affect coastal cities/ towns
    o Urban heat island due to global warming
    o Sea surge increase the level of sea in coastal cities

Urban flooding in India	Reasons
2015 Chennai flood	Floodplain encroachment
2020 Hyderabad flood	Depression and flash flood
2022 Bengaluru flood	Poor urban management
2023 Delhi flood	Prolonged rainfall and floodplain encroachment

As per Ministry of Housing and Urban Affairs India will have 50% urban population by the end of 2050, so India must adopt sustainable practices to cope up the pressure.

What are the causes of urban flooding?

- **Hydrological factors-** It is caused by change in river course, presence of high tide and synchronisation of runoffs of various parts of watershed.
- **Urban heat island-** It resulted in increase in rainfall leads to flash flood which is a cause of concern in low lying areas and urban cities where the damage inflicted is huge.
- **Sea surge-** Storm surge due to tropical cyclones causes sea water to overflow into cities nearby coastal regions.
  - As per the Intergovernmental Panel on Climate Change (IPCC), it is estimated that before 2030, large parts of Kolkata could face immense flooding, causing the city to submerge.
- **Concretisation-** Building huge structures in urban areas leads to insufficient drainage infrastructure leading to urban flooding.
  - Example- 2021 Chennai flood.
- **Pluvial flooding-** It is a rain-driven flooding that results from the excess of natural or engineered drainage capacity.
- **Deforestation**- Trees act like a sponge that helps to hold soil.
- As trees are being cut down at a fast pace to make way for urbanisation to grow, more water runs towards a river during heavy rainfall and causes flood.
- **Floodplain encroachment-** This reduces the water carrying capacity of rivers which is brought from upper catchment areas and cause flooding.
  - One of the reasons for 2015 Chennai floods is floodplain encroachment.
- **Drainage systems** - Stormwater drainage systems in the past were designed for rainfall intensity of 12 – 20 mm.
- These capacities have been getting very easily overwhelmed whenever rainfall of higher intensity has been experienced.
- **Unplanned release of water from dam**-Kerala flood in 2018 is due to prolonged rainfall accompanied by unplanned release of water from Idukki dam.

- **Climate change** - Influence of urban microclimate and climate change are other factors.

Urban flooding is the highest reported climate hazard facing C40 cities with 92% of C40 cities experiencing flash or surface flooding due to rainfall or riverine flooding.

What are the consequences of urban flooding?

- **Loss of life and property** - Urban area has high population density and huge infrastructure.
- Every year, millions of people become homeless and washed away due to floods.
- **Disruption of Communication-**Flood causes damage to transportation links such as bridges, rail, power plants etc., thus causing communication disruption in those areas.
- **Economic and Social Disruption**- Urban area is the key centre for economic activity, the economy comes to a standstill as people are forced to move to another place.
- **Hygiene-** Detoriation of water quality which would result in the spread of communicable disease and water borne diseases.
- **Epidemics**- Waterborne diseases (cholera, typhoid fever, hepatitis) and vector-borne diseases (dengue, malaria) are caused due to floods.

International Practices to Mitigate Urban Flooding	
Country	**Best practices**
South Africa	Water Sensitive Urban Design and Sustainable Drainage Systems
China	Sponge city initiative to reduce flood and enhance water supply security
Rotterdam	Raingardens and permeable pavements
Dutch model	The country is dotted with ponds, lakes, seaside parking garages and city plazas that double up water storage

What steps were taken to mitigate urban flooding?

- **NDMA –** After the Mumbai floods of 2005, NDMA has for the first time decided to address urban flooding as a separate disaster, delinking it from floods.
- **Atal Mission for Rejuvenation of Urban Transformation (AMRUT)-** It is an initiative to provide basic civic amenities to the urban areas to improve the quality of life.

- **Smart Cities Mission-** It is initiated to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens.
- **HRIDAY Misison-** National Heritage City Development and Augumentation Yojana which aims to conserve heritage, urban planning and increase the economic growth of the heritage cities.

What lies ahead?

- **Legal Enforcement-** India should enforce laws to check on encroachment of lands in the urban areas.
- **Climate resilient structures-** It should be in line with **SDG 11-**Sustainable cities and communities.
- **Proper drainage infrastructure-** Conduct monsoon audits regularly to mitigate the flood effects.
  - Tamil Nadu has appointed **Tirupugazh Committee** to recommend on flood mitigation.
- **Greening cities -**East Kolkata's wetlands have been an effective flood defence mechanism that help treat a large share of the city's sewage, produce half of the city's fresh vegetables.
- **Flood plain mapping-** It improves flood management response and helps the community to understand their flood risk.
- **Rain Water Harvesting (RWH) –** Adopt RWH in all infrastructure constructions to ensure better water management.
- **Bioswales-** It must be constructed for percolation of rainwater into the ground.
- **Blue-Green Infrastructure-** It uses infrastructure, ecological restoration, and urban design to connect people with nature to solve urban and climate problems.

GS 2 : Polity, Governance, International Relations

1. **Registration of Birth and Death (Amendment) Bill 2023**

Registration of Birth and Death (Amendment) Bill 2023 was tabled in Lok Sabha recently.

Registration of Birth and Death Act 1890

- It is an Act to provide for the regulation of registration of births and deaths and for matters connected therewith.
- Aim - To promote uniformity and comparability in the registration of Births and Deaths across the country
- **Power-**It made registration of birth and death mandatory with the power to the *State government.*
- **Hierarchy**

Authority	Jurisdiction
Registrar General of India	At central level
Chief Registrar	At state level
District Registrar	At district level
Registrars	At local level

- **Registration-** Births, stillbirths and deaths are to be registered within 21 days of occurrence.
- **Penalty-** Violating the provisions is a punishable offence, incurring a fine of Rs 5.
- **Individual database-** The States and Union Territories has to maintain individual databases on the Civil Registration System.
- It comes under the operational control of the *Registrar General of India (RGI).*
- **Increased registration-** There has been increase in the registration due to population growth, awareness, and interconnected welfare services.
  - Example- To obtain Aadhaar card, birth certificate is required.

Registrar General of India is an office established under the Ministry of Home Affairs.

What is the need of the amendment?

- The U.N. Human Rights Office of the High Commissioner (OHCHR) has highlighted that streamlining birth and death registration processes contributes "to higher registration rates and increased coverage".
- **Case study of Bihar**- Study of Civil Registration System found registration challenges like lack of investment, poor delivery of services at the registration centres, limited computer and internet services.
- **NFHS-5 data**-Death registration for females is lower than males, poor compliance creates a data gap this leads to misguided policies.
- **Flawed death rate during COVID-**Lack of complete and timely death registration data on India's COVID-19 deaths prevented accurate measures of mortality.
- It masked the true extent of its impact in some States more than others.
- **Delay in census**- Unable to find the estimates of poverty, hunger, education, healthcare access.
- **Preparation of database-**To ensure efficient and transparent delivery of public services.
- **Birth certificate as a single document-**
    - Admission to an educational institution,
    - Issuance of a driving licence, preparation of a voter list,
    - Aadhaar number, registration of marriage or appointment to a government job.
- **Citizen friendly-**To keep in pace with societal change and technological advancements there is a provision of digital registration.
- **Avoid multiplicity of documents**- It will provide for issuance of a passport, Aadhaar number etc., as determined by the central government to enhance the public convenience.

What are the new features of the Bill?

Features	Existing Act	New Act
Registration of birth and death	Registrar General of India will provide guidelines for registration.	Maintain database - At central level- Registrar General of India. - At state level- Chief Registrars
Death certificate	The registrar of State Government may require death certificate.	It is made mandatory for the registrar to obtain the death certificate.
Providing Registration details	After registration, the Registrar must provide extracts of the prescribed information to the	The registrar must provide the certificates to the person who registered it within 7 days.

	person who registered it, for free.	
Provision of electronic certificates	Any person may obtain extract of the birth or death certificates from registrar as per rules	Electronic certificates is provided instead of extracts

What are the other amendments?

- **Centralised database-** The States need to compulsorily share granular, real-time data, by giving the RGI access to the Application Programming Interface.
- **360 degree surveillance-**The central data reservoir will be updated in real-time, without any human interface and independent of location.
- **Update other portals-** the centralized database will be used to update
  - National Population Registrar
  - Electoral Registrar, Driving license
  - Aadhaar, Ration card, Passport
  - And other national level database as may be notified.
- **Birth certificate as mainstay-** It assigns individuals a unified marker governing their mobility, allowing access to basic services.
- **Aadhaar integration-** Aadhaar number of parents, family members is required to be collected by the necessary authorities for providing birth and death certificates.
- **Child adoption**- It seeks to collect Aadhaar details to facilitate registration in non institutional adoption centres.
- **Appeal** - Any person aggrieved by any order of the Registrar or District Registrar may appeal to the *District Registrar or Chief Registrar*, respectively.
- Such an appeal must be made *within 30 days* from receipt of such action or order.
- The District Registrar or Chief Registrar must give their decision *within 90 days* from the date of appeal.

What are the issues?

- **More decentralisation**- It leaves people vulnerable to exploitation by those facilitating the registration process.
  - The 2022 survey in Bihar found that CRS staff demanded bribes for providing certificates which are available free of cost.
- **Inaccurate data -** Linking Aadhaar to voter-ID card resulted in deleting 55 lakh voters from the system.
  - 5 crore workers name found missing from MGNREGA scheme.
- **Security-** India doesn't have a robust security surveillance, there is a concern over absence of data bill.

2. Controlled Human Infection Studies

Recently, Indian Council of Medical Research (ICMR) released a policy statement for the ethical conduct of Controlled Human Infection Studies (CHIS).

What is controlled human infection studies?

- It refers to the research methodology that involves *intentionally exposing healthy human volunteers to a specific pathogen or infectious agent* under controlled conditions.
- It is also called as human challenge studies in India which is different from human clinical trials.
- **Aim**- To understand disease pathophysiology & immune responses, develop vaccines, test treatment modalities and evaluate the safety and efficiency of potential new chemical entities.
    o Example- The yellow fever study in the early 1900s, for instance, established that mosquitoes transmitted the yellow fever virus.
- **Types**
    o Vaccine development trails
    o Treatment studies
    o Challenge studies

What are the benefits of CHIS?

Infectious disease contributes about 30% of the disease burden in the country.

- **Better insights of disease**- Conducting these studies in endemic settings can lead to outcomes relevant to the local population.
- **Drugs in lesser time** - Vaccine research uses data related to immune responses in early vaccine development and assess the minimum required dose for protection and immunization in shorter time frames.
- **Better medical surveillance**- Researchers can closely monitor the development and progression of an infectious disease from its earliest stages.
- **Effective policy**- CHIS can improve understanding of specific aspects of the transmission patterns this would contribute to the development of effective public health strategies and policies.
- **Improve research capacity**- Conducting CHIS can contribute towards building local research capacities, clinical facilities, laboratory diagnostics, experimental medicine and clinical governance on par with global initiatives.

Many countries, including low-and middle-income countries such as Colombia, Kenya, Tanzania and Thailand, have carried out human challenge studies.

What is the difference between human clinical trials and human challenge studies?

About	Human clinical trials	Human challenge studies
Nature of exposure to pathogens by participants	They are strongly advised to adopt and adhere to safety measures to avoid getting infected.	Volunteers in a human challenge study are deliberately exposed to disease-causing pathogen
Aim	To study the safety and efficacy of drugs and vaccines	To understand the various facets of infection and disease pathogenesis besides selecting the best candidate drug or vaccine
Adverse effects	Safety is evaluated for the first time in humans during the phase-1 stage of a traditional trial	They face an additional risk when deliberately exposed to the pathogen.
Implementation	They are undertaken in four phases generally to test the efficacy.	They are undertaken to study "less deadly diseases" such as influenza, dengue, typhoid, cholera and malaria

- **Special safeguards-** There has been a special safeguard in human challenge studies to prevent from SARS CoV 2 virus that causes COVID
  - To reduce harm to the participants, a *weaker or less virulent* form of the pathogen is used.
  - There should be a *'rescue remedy'* to prevent the disease from progressing to its severe form.
    - Example- *Remdesivir* as rescue remedy for the participants in SARS-CoV-2 virus studies even when the substantial mortality benefit of remdesivir is unknown.

What are the guidelines in ICMR consensus policy statement?

- **Allowed to participate-** It is clearly mentioned that only healthy individuals in the 18-45 years age bracket are to be enrolled.
- **Not allowed to participate-**
  - Children and women who are pregnant, lactating or
  - Planning to conceive within the study period
  - Children will be included when "deemed appropriate"

  o Participants with pre-existing medical conditions.
- **Medical Examination**-A detailed medical examination of the participants is required before enrolment.
- **Payment for participants**- Information on payment should be mentioned in the consent form but the exact amount of payment for participation is to be revealed "only after the volunteer has consented to participate".

What are the ethical issues with human challenge studies?

- **Deliberate exposure-** The human challenge trial are deliberately exposed to a disease-causing pathogen which makes it ethically more challenging.
- **Payment issue-** It is left to the investigators to not reveal the payment before the participant gives his or her informed consent.
- Assured payment even when the amount is not revealed may serve as an inducement.
- **Need of effective rescue remedy** – Infections like SARS-CoV-2 virus remains asymptomatic in some people while leading to death in others.
- The disease state in an individual cannot be 100% predicted even when a less infectious agent is used.
- **Issue with informed consent-** When the pathogen is studied in specific age groups such as children or disadvantaged groups.
  o Example- HPV vaccine trial in Andhra Pradesh in 2010, COVAXIN trial in Bhopal in 2020.

What lies ahead?

- Indian scientists should gain medical intervention expertise knowledge.
- There should be robust institutional structures and mechanisms in place to deal with the ethical challenges of human challenge studies.

3. Sub-Categorisation of OBCs

The report of Rohini commission which was set up to examine the sub-categorisation of OBCs was submitted to the President.

Need of the commission

According to SECC 2011, total households in the country (rural plus urban) is 24.49 crore. Households considered for deprivation is 10.74 crore.

- Other Backward Classes (OBCs) get 27% reservation in central government jobs and admission to educational institutions.

- There are more than 2,600 entries in the Central List of OBCs, but over the years, a perception has taken root that only a few affluent communities among them have benefited from the quota.
- Therefore, there is an argument that a "sub-categorisation" of OBCs (quotas within the 27% quota) is needed in order to ensure "equitable distribution" of the benefits of reservation.
- The Parliamentary Committee had said that as on 2016, OBC employees in 78 ministries and departments of the Central government constituted only 21.57% against the quota of 27%.
- Hence, **Rohini Commission** was constituted by the Government.

Backward Class Commissions	Chairman
First Backward Class Commission-1955	Kaka Kalelkar
Second Backward Class Commission-1979	Mandal
Sub categorisation of OBCs-2017	Justice Rohini

What about the Rohini Commission?

Article 340 provides for the appointment of a Commission to investigate the conditions for the improvement of socially and educationally backward class

- **About-** Constituted in 2017 under **Article 340** of the Constitution
- **Chairman-** Justice G.Rohini, a retired Chief Justice of Delhi High Court.
- **Functions-** To examine the extent of inequitable distribution of benefits of reservation among the castes or communities included in the broad category of OBCs.
- To identify the respective castes or communities or sub-castes in the Central List of OBCs and classifying them into their respective sub-categories.
- To formulate scientific data on sub-categories and ensuring equitable redistribution of 27% of quota benefits among all sub-communities.
- To recommend corrections of any repetitions, ambiguities, inconsistencies and errors of transcription or spelling.
- After 13 extensions, the committee submitted its report to President and it has not been made public yet.
- **Challenges**
  - COVID pandemic- It slowed down the work of the commission, during second wave the government reported that committee is working on finalising the report.
  - Missing Data-Absence of data on the population of various communities to compare with their representation in jobs and admissions

Key findings in 2018

- It analysed the data of 1.3 lakh central government jobs under the OBC quota over the preceding five years.
- **Findings** - Less than 1% of backward castes have cornered 50% of the reservation benefits in admissions to Central educational institutions and recruitment to Central services between 2014 and 2018.
- There are more than 2,600 communities on the OBC Central list but 938 OBC sub-castes have no representation in the reserved seats.
- However, this analysis suffered from limitations due to the absence of updated population data.

What is the significance of the report?

- **Recommendation**- It suggested breaking the caste groups into broad categories,
  - With the dominant castes (most access to benefits) getting the smallest share of the 27% reservation, and
  - The historically crowded-out caste groups getting the largest share of the reservation pie.
- **Impetus to caste based survey-** Many State Governments are pushing the Centre for independent caste based survey in their jurisdiction.
  - Patna High Court recently upheld the Bihar Government's right to conduct such caste survey.
- **Updation of caste related population-** Haryana, Madhya Pradesh, Uttar Pradesh and Bihar, have conducted exercises to bring OBC reservation in urban local body poll.

What lies ahead?

- **Periodic revision-** There is a need to frequently revise the income limit in determining the creamy layer.
- Inclusion of factors such as the trend of rise in GDP, inflation, per capita income and rise in the cost of living, etc. is needed while revising the income limit.
- **Change income definition-** The definition of income exempts income from salary and agriculture but takes into account income from other sources and this need to be changed.
- **Strong political will-** Political parties should channel their energies to make substantive and qualitative changes in the way the reservation is implemented.
- There is a need to develop an evidence-based policy options that can be tailored to meet specific requirements of specific groups.

- **Institution support-** An institution like the Equal Opportunities Commission of the United States or the United Kingdom is in need.
- **Conduct audit-** An audit on performance of employers and educational institutions on non-discrimination and equal opportunity can be undertaken.

4. Forest (Conservation) Amendment Bill, 2023

Recently, Lok Sabha passed the Forest (Conservation) Amendment Bill, 2023 that seeks to amend the **Forest (Conservation) Act, 1980.**

- The Act's name changed to **Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980**, by inserting a Preamble for reflecting its provisions' potential.

Key features of the bill:

Land under the purview of the Act:

- The Bill provides that **two types of land** will be under the **purview of the Act**:

- **Land declared/notified** as a **forest under the Indian Forest Act, 1927** or under any other law.
- **Land not covered in the first category** but notified as a **forest on or after October 25, 1980** in a government record.

- The Act will **not apply to land changed from forest use to non-forest** use on or before December 12, 1996 by any authority authorised by a state/UT.

Exemptions:

- Forest land **along a rail line** or a **public road maintained** by the **government** providing access to a habitation, or to a rail, and roadside amenities up to a **maximum size of 0.10 hectares**.
- Land situated **within 100 km from international borders**, **Line of Control**, or **Line of Actual Control**, for **construction of a strategic linear project** of national importance and concerning national security.
- **Land up to 10 hectares**, for **constructing security-related infrastructure**.
- Land proposed to be used for **constructing defence-related projects**, **camps** for **paramilitary forces**, or **public utility projects** up to **five hectares** in a **left-wing extremism-affected area.**

Assignment/leasing of forest land:

- **State government** requires **prior approval** of the **central government** to assign forest land to **any entity not owned or controlled by government**.
- This **condition is extended to all entities**, including those owned and controlled by the government.

- It also requires that **prior approval** be subject to terms and conditions prescribed by the central government.

Permitted activities in forest land:

- The Act restricts the **de-reservation of forests** or use of forest land for non-forest purposes.
    - Such restrictions may be lifted with the **prior approval of the central government**.
    - **Non-forest purposes** include use of **land for cultivating horticultural crops** or for any purpose other than reafforestation.
- It specifies certain activities that will be **excluded from non-forest purposes**, meaning that restrictions on the use of forest land for non-forest purposes will not apply.
- These activities include works related to the **conservation, management**, and **development of forests and wildlife** such as **establishing check posts**, **fire lines**, **fencing**, and **wireless communication**.
- **Zoos and safaris** under the Wild Life (Protection) Act, 1972 owned by the government or any authority, in forest areas other than protected areas.
- Establishment of Zoo and Safaris, etc. will be **owned by Government** and will be set up as per the Plan approved by the **Central Zoo Authority** outside the Protected Areas.
    - **Ecotourism**, as per approved Working Plan or **Wildlife Management Plan or Tiger Conservation Plan** will be taken up in the forest areas.
- Silvicultural operations (enhancing forest growth)
    - The central government may specify terms and conditions to **exclude any survey** (such as exploration activity, seismic survey) from **being classified as non-forest purpose**.
- **Power to issue directions:**
- The Bill adds that the **central government may issue directions** for the **implementation of the Act** to any **authority/organisation under** or recognised by the centre, state, or union territory (UT).

What is the need for amendment?

- People are concerned that if individuals or organizations start planting trees on their lands, they may attract the **FCA (Forest Conservation Act).**

- Unfortunately, there isn't enough motivation for **tree planting outside forests**, which hinders increasing the green cover to meet the Nationally Determined Contribution targets.
- These targets aim to create an additional carbon sink of **2.5 to 3.0 billion tons of CO2 equivalent.**
- It is crucial to **expedite strategic and security-related projects of national importance**. This will ensure the development of **essential security infrastructures**, especially in areas like Line of Actual Control (**LAC**), Line of Control (**LoC**), and notified Left-Wing Extremism (**LWE**) areas.
- **Small establishments** and **habitations** on the side of **roads/railways** also need to be facilitated by providing them access and **connectivity to main arterial roads** and other **public utilities**.
- New challenges relating to **ecological, social, and environmental developments** have emerged at national as well as international levels.
- For example mitigating the **impact of climate change**, achieving the **national targets of Net Zero Emission by 2070, maintaining or enhancing the forest carbon stock**, etc.
- Therefore, to carry forward the **country's rich tradition of preserving forests and their bio-diversity** and to tackle the climate change challenges, it is necessary to encompass such issues in the ambit of the Act.

About The Forest (Conservation) Act, 1980:

- It provides that the **de-reservation of reserved forests**, **use of forest land for non-forest purposes**, assigning forest land by way of lease or otherwise to private entities and clearing of naturally grown trees for the purpose of reafforestation requires **prior permission of the Central Government**.
- The **applicability of the act** in various types of lands has been dynamic i.e., initially provisions of the Act were being applied to the **notified forest land only**.
  - Subsequently, after the Judgement, the **Act was made applicable to revenue forest land** or in **lands which were recorded as forest in government records** and to areas which look like forest in their dictionary meaning.

5. **Indian Institute of Management Bill, 2023**

The Indian Institute of Management Bill, 2023 was recently introduced in Lok Sabha.

Indian Institute of Management Act 2017

- **Institutes of national importance-** It declared 20 existing IIMs as "institutions of national importance.
- **Aim-** To empower IIMs to attain standards of global excellence in management, management research and allied areas of knowledge".
- **Autonomy-** The legislation seeks to grant greater administrative, academic and financial autonomy to these IIMs.
- The institutes will be made free of government interference and will be board-driven.
- **Offer degrees-** The legislation would grant IIMs power to award full-fledged degrees instead of diplomas.
- **Board of Governors-** It is the executive body of each IIM, comprising up to 19 members.
- In 19 members, 2 members will be nominees from the central and state governments, respectively. The Board appoints its own Chairperson.
- **Director-** It is appointed by the Board of Governors for each IIMs, A search committee will recommend names for the post of the Director.
- **Functions of Academic council-** It shall be the principal academic body of each institute which will determine the
  - o Academic content
  - o Criteria and process for admission to courses
  - o Guidelines for conduct of examinations.
- **Coordination forum-** It is the representation from the 20 IIMs which is set up to discuss matters of common interest to all IIMs.

What is the need for amendment?

- **Tussle with director-** At IIM Ahmedabad, faculty and alumni were up in revolt against the then director's decision
  - o To change the institute's logo
  - o To demolish the Louis Kahn structures on the campus which are widely regarded as among the architectural marvels of our times.
- At IIM Calcutta, the majority of faculty signed a petition against the director's way of functioning.
- The Board of Governors took the extraordinary step of curtailing her powers following which she left before the end of her term.
- **Legal battle**- At IIM Rohtak, the government is locked in a legal battle with the institute over the director's continuance in office.
- **Low rank of IIMs-** Evidence suggests that some IIMs lower in rank unchallenging power of Director.
- **Fee structure**- There is a rise in the fee for the MBA course, which is not related to the costs of the course.
- **Lack of accountability**- The Board of Governors' role is ineffective as there were only 2 Government nominees who played a passive role.

- The other members have no stake in respective institution and no incentives to exercise the necessary oversight.
- **Governance vacuum**- The Act requires Board of Governors (BoG) to commission an independent review of the institutes at least once every 3 years and place the report in the public domain.
- Among the top four only the review report of IIM Bangalore is available on websites.

What are the new features of the bill?

Features	Existing Act	New Bill
Visitor	No such provision	It designates the President of India as Visitor of every Institute
Appointment of IIM directors	Appointed by the Board of Governors on the recommendations of a Search-cum-Selection Committee	Mandates the Board to obtain the prior approval of the Visitor before appointing an Institute Director
Composition of Search Committee	Chairperson of the Board, and 3 members from amongst eminent administrators, industrialists, educationists	Reduces 3 members to two, and adds another member to be nominated by the Visitor
Removal of director	Removed due to insolvency, mental and physical incapacity, conflict of interest	Requires prior approval of the Visitor before removing a Director. Visitor has the authority to terminate the services of the Director
Chairperson of the Board of Governors	Appointed by the Board of Governors	Nominated by the visitor
Power of inquiry against IIMs for non-compliance with law	A retired High Court judge conducts inquiries, then the Board may take any action that it deems fit.	Conferred upon visitor who may appoint persons to review the work of any Institute. The visitor then issue directions to the institute which is also recommended by the board
Chairperson of coordination forum	Selected by the search cum selection committee constituted by the forum	Nominated by the visitor. The Chairpersons of all Institutes will be ex-officio members of the Forum
Incorporation of institute	If existing institution converts to an IIM, every	The Bill excludes the Director of such institutions from this

	employee of such institution will retain the same tenure, salary, pensions	provision

What are the other amendments?

- **Functions of visitor-** It prescribes the primary roles for the visitor
  - To make appointments,
  - To audit the working of institutions,
  - To conduct an inquiry.
- **Dissolution of Board**- The central government prescribes the conditions and procedure for dissolving or suspending an Institute's Board.
- If a Board is suspended or dissolved, the central government will constitute an interim board for six months or until a new Board is constituted.
- **IIM classification**- The National Institute of Industrial Engineering (NITIE), Mumbai is classified by the bill as IIM, Mumbai.

What lies ahead?

- **IIT governance -** Government control has not kept the IITs from creating a brand that is way above that of the IIMs.
- **Democratic accountability-** It is mandatory in a public institution which will improve the governance and administration of IIMs.
- **US model-** Private universities are funded through large endowments and the state supports research.
- The donors have deep emotive connect with the institutions and hence there is no game of large profits which improves the competitive environment and discipline of the financial markets.
- **Californian system-** The Governor of the state often sits on the board which is best in the world.

6. Police Reforms in India

Incidents like an outbreak of communal violence in Delhi region and violence in Manipur's Imphal Valley raises concerns over the role of law enforcement.

About Police and Policing Framework in India

- The primary role of police forces is to uphold and enforce laws, investigate crimes and ensure security for people in the country.

- In a large and populous country like India, police forces need to be well equipped, in terms of personnel, weaponry, forensic, communication and transport support, to perform their role well.

Constitutional and legal provisions:

- Under the Constitution, '**Police' and 'Public Order'** are **state subjects** under the **Seventh Schedule to the Constitution of India**.
    - o Therefore, each state has its own police force.
- The center is also allowed to **maintain its own police forces** to assist the states with ensuring law and order.
- The basic framework for policing in India was laid down in the pre-independence era through the **Police Act, 1861.**
- Apart from the above, several other laws and regulations govern police functioning in India.
    - o These include **the Criminal Procedure Code (CrPC), Indian Penal Code (IPC), Evidence Act and various state-specific laws.**

Significance of police reforms:

- **Low police-to-population ratio**: The global average ratio of police-population is 270 to 100,000, where it is 120 in India.
    - o With far less police –ill-equipped and most of them posted to protect the political representatives, people of India are the least secured people on the globe.
- **Corruption:** In 2016, the vigilance department had conducted 55% more inquiries against its men.
    - o A Delhi Police survey found 34% of the cops to be corrupt in 2015, down from 66% in 2014.
- **Changing nature of crime**: The recent social and technological changes fueled by the internet and the new social media are fast changing the nature, intensity and the reach of crime leading to unprecedented lawlessness and frightening dimensions of global terrorism.
- **Insensitive towards backward classes:** Representation of women and depressed caste is low which makes them insensitive towards them.
    - o Escalating violence resulting from caste conflicts including the most recent Dalit uprising, farmers woes across the country.

Issues in Police Forces

Colonial Law: Even at present, the police system in India is based on colonial law.

- Sometimes the British used the police as their instrument to suppress the voice of people and for their personal functions and at present our respected government is doing the same.

Huge vacancies: While the sanctioned police strength was 181 police per lakh persons in 2016, the actual strength was 137 police.

- This is excessively low when compared with the United Nations' recommended standard of 222 police per lakh persons.
- Further, a high percentage of vacancies within the police forces exacerbates an existing problem of overburdened police personnel.

Custodial Death: There are many cases on custodial death means Death by torture/pressure in police/judicial custody.

- During 1996-1997 in D.K.Basu judgment, the Supreme Court (SC) issued a guideline against custodial death in India.

Police Infrastructure (weapons, vehicle etc.): Modern policing requires strong communication support, state-of-the-art or modern weapons, and a high degree of mobility.

- Even the fund's allotted face Underutilization.

Law on Torture: India has only signed the "United Nation Convention on torture" but yet to pass by the Parliament.

- India does not have a specific law for torture.

Political Interference: Police officers are not able to do their work due to the interference of political leaders.

- There is no minimum tenure security for officers at the higher post and not even place posting security.

Promotions and working conditions: Qualifications and training of police personnel are not up to the mark, especially for lower levels of officials.

- The lower ranks of police personnel are often verbally abused by their superiors or they work in inhuman conditions.
- This non-harmonious work environment ultimately affects their relationship with the public.

Way Forward: Seven Directives of the Supreme Court (SC)

- **Limit political control:** Ensure that the state government does not exercise unwarranted influence or pressure on the police.
- **Appoint based on merit:** Ensure that the Director-General of Police is appointed through a merit-based, transparent process, and secures a minimum tenure of 2 years.
- **Fix minimum tenure:** Ensure that other police officers on operational duties (Including Superintendents of Police in charge of a district and Station House Officers in charge of a police station) are also provided with a minimum tenure of 2 years.
- **Separate police functions:** Separate the functions of investigation and maintaining law and order.
- **Set up fair and transparent systems**: Set up a Police Establishment Board to decide and make recommendations on transfers, postings, promotions and other service-related matters of police officers of and below the rank of Deputy Superintendent of Police.
- **Establish a Police Complaints Authority in each state**: At the state level, there should be a Police Complaints Authority to look into public complaints against police officers of and above the rank of Superintendent of Police in cases of serious misconduct, including custodial death, grievous hurt or rape in police custody.
  - At the district level, the Police Complaints Authority should be set up to inquire into public complaints against the police personnel of and up to the rank of Deputy Superintendent of Police in cases of serious misconduct.
- **Set up a selection commission:** A National Security Commission needs to be set up at the union level to prepare a panel for selection and placement of chiefs of the Central Police Organizations with a minimum tenure of 2 years.

7. 50% of routes under Ude Desh ka Aam Naagrik (UDAN) Scheme get stranded

Some airports were abandoned due to the collapse of almost **half the routes** launched under the **Ude Desh ka Aam Naagrik (UDAN)** scheme.

Ude Desh ka Aam Naagrik (UDAN) Scheme

- UDAN is a **regional airport development program** of the government.
- It is a part of the **Regional Connectivity Scheme (RCS)** of upgrading under-serviced air routes.
- Its goal is to make **air travel affordable** and **improve economic development** in India.
- It was launched in 2017 to improve air connectivity for **tier-2 and tier-3 cities,** and **redevelop under-utilised** airports like old airstrips**.**

- It is a key component of **National Civil Aviation Policy (NCAP)** released by the **Ministry of Civil Aviation** in 2016.
- The process of bidding allocates airline companies to operate with subsidies from the government.
- After a three-year period, airlines would **sustain operations** on their own, without government support.

What are the issues with Udan Scheme?

- The government built 74 airports out of which 11 were built from **scratch (Greenfield)** and 15 have fallen into **disuse due to collapse of routes** under RCS.
- The **water dromes** (built for seaplanes) between **Gandhinagar and the Statue of Unity** (Gujarat), closed down after change in technical requirements.

Subsidized Routes:

- The airlines are given **incentives and viability gap funding** (or subsidy) based on a bidding process which was about 50% of its seating capacity.
- The companies **must sell 50% of seats** at affordable prices and provide **RCS levy** to passengers on non-RCS flights.
- Some airports were redeveloped by the **Airports Authority of India (AAI),** and the rest by State governments and Public Sector Units.

Commercially unviable:

- **225 routes** were closed, out of which **128** were before the mandatory three-year period because they were deemed **unprofitable despite subsidies**.
- **58 flights** were cancelled due to noncompliance, route surrender, or airline closure.
- **12 routes** are inactive due to airport readiness, market challenges, and low demand.

8. SC questions equating Article 370 to Basic Structure

- The Supreme Court is currently deliberating on the abrogation of Article 370, which granted special status to Jammu and Kashmir.

- The court is exploring whether Article 370 can be equated with the Basic Structure of the Constitution, a principle that enshrines essential features beyond the Parliament's amendment powers.

Debate over Article 370

- **Constitutional Process:** It has been argued that the abrogation of Article 370 was a purely political act and that there was no constitutional process available to revoke it.
- **Equating with Basic Structure:** The court questioned whether considering the abrogation of Article 370 as impossible amounts to equating it with the principles of the Basic Structure of the Constitution.
- **Article 370 as a "Compact":** It has been contended that Article 370 was not part of the Basic Structure but a "compact" between the princely State of J&K and the Government of India, engrafted into the Indian Constitution.
- **Government's Actions:** Concerns have been raised about the government's insertion of Article 367(4)(d), which some argue circumvented the "residuary power" of the State and allowed the Parliament to act as the J&K Constituent Assembly.

Challenges and Concerns Raised

- **Permanence of Article 370:** The permanence of Article 370 after the Constituent Assembly's dissolution in 1957 and the procedure followed by the NDA government during the abrogation have been debated.
- **Constitutional Machinery:** Criticisms have been raised that the Parliament and President took over the powers of the State without considering the views of the people of Jammu and Kashmir.
- **Breakdown of Constitutional Structure:** Some argue that the events leading up to the abrogation constituted a "complete breakdown" of the constitutional structure, as the State's powers were absorbed by the Centre, and the State was bifurcated without proper consent.

Conclusion

- The Supreme Court's ongoing hearings on the abrogation of Article 370 continue to raise important questions about its status and the process involved.
- The court's decision will have significant implications for understanding the constitutional relationship between the Centre and the States and the sanctity of special provisions like Article 370.

9. ASI Survey of Gyanvapi Premises

A three-judge bench of the Supreme Court upheld an order by the Allahabad High Court allowing the Archaeological Survey of India (ASI) to conduct its investigation of the Gyanvapi mosque in Varanasi.

What is the issue about?

- The controversy erupted in 1991 when a group of local priests sought permission to worship in the Gyanvapi complex, claiming the mosque was built on a demolished portion of Kashi Vishwanath Temple.
- The matter was reignited after petitioners demanded an archaeological survey of the Gyanvapi complex.
- The Varanasi district court ordered the ASI survey of Gyanvapi complex on an application moved by four Hindu women in 2023.
- The Allahabad High Court had given its nod for the ASI to go ahead with the survey ordered by the Varanasi District Judge.

The mosque is not an ASI-protected site, and the ASI has no role in its maintenance or upkeep.

What is the Supreme Court's order?

- The Supreme Court allowed the Archaeological Survey of India (ASI) to conduct its investigation of the Gyanvapi mosque in Varanasi.
- It has asked the expert body to use only "non-invasive methodology" throughout its survey.
- The survey is meant to determine whether the 17th century mosque had been constructed over a pre-existing Hindu temple.
- The Muslim side contend that the survey was a breach of the Places of Worship (Special Provisions) Act of 1991, which was enacted to guard fraternity and secularism through protection of the religious character of religious places.
- They argue that the 1991 Act prohibited any attempts to convert the religious character of a place of worship as it had existed on the day of Independence.

The Archaeological Survey of India (ASI), Ministry of Culture, established in 1861 is the premier organization for the archaeological researches and protection of the cultural heritage of the nation.

What is the Places of Worship Act?

- **Aim-** The Places of Worship Act, 1991, seeks to prohibit the conversion of a place of worship and maintain its religious character as was at the time of India's Independence on August 15, 1947.
- **Features-** It bars the conversion, in full or part, of a place of worship of any religious denomination into a different religious denomination or even a different segment of the same religious denomination.
- Any suit or legal proceeding regarding the conversion of the religious character of any place of worship existing on August 15, 1947, pending before any court shall end and no fresh suit shall be instituted.
- **Exemptions-** Section 5 stipulates that the Act shall not apply to the Ramjanmabhoomi-Babri Masjid case.
- It exempts any place of worship, which is an ancient and historical monument or an archaeological site covered by the Ancient Monuments and Archaeological Sites and Remains Act, 1958.

10. Parliamentary Privilege and the Privileges Committee: A Closer Look

- During the ongoing Monsoon Session of Parliament, there were differences between the ruling and opposition parties, leading to complaints against 2 MPs.
- These complaints were referred to the Privileges Committee.

Parliamentary Privilege

- **Definition:** Parliamentary privilege refers to the rights and immunities enjoyed by legislators during the course of their legislative duties.
- **Protection:** MPs/MLAs are protected from civil or criminal liability for actions or statements made while discharging their legislative functions.
- **Constitutional Basis:** The powers, privileges, and immunities of both Houses of the Indian Parliament and their members are enshrined in Article 105 whereas Article 194 deals with State Legislatures.

Understanding Privilege Motion

- **Breaching Privilege:** Any disregard of the rights and immunities constitutes a breach of privilege and is punishable under parliamentary law.
- **Motion:** A notice in the form of a motion can be moved by any member of either House against those held guilty of a breach of privilege.

- **Contempt Actions:** The Houses also have the right to punish actions that may not be a specific breach of privilege but are offenses against their authority and dignity.

Instances of Privilege Notices

- **Indira Gandhi's Expulsion (1978):** Indira Gandhi was expelled from the Lok Sabha for obstructing government officials from collecting information for a question on Maruti.
- **Subramanian Swamy's Expulsion (1976):** Subramanian Swamy faced expulsion from the Rajya Sabha for engaging in interviews perceived as "anti-India propaganda."
- **Cash for Query Scandal (2005):** Eleven "tainted" MPs involved in the cash for query scandal were expelled from the Lok Sabha.

Rules Governing Privilege

- **Lok Sabha:** Rule No. 222 in Chapter 20 of the Lok Sabha Rule Book governs privilege.
- **Rajya Sabha:** Correspondingly, Rule 187 in Chapter 16 of the Rajya Sabha rulebook deals with privilege.
- **Scope of Notice:** The notice must relate to a recent incident requiring the intervention of the House.
- **Timing:** Notices must be given before 10 am to the Speaker or the Chairperson.

Role of the Speaker/Rajya Sabha Chair

- **Scrutiny:** The Speaker/RS Chairperson is the first level of scrutiny for a privilege motion.
- **Decision Making:** They can decide on the privilege motion themselves or refer it to the Privileges Committee.
- **Opportunity to Speak:** If consent is given under Rule 222, the member involved is given an opportunity to make a brief statement.

Referring to the Privileges Committee

- **Composition:** In the Lok Sabha, the Speaker nominates a 15-member Committee of Privileges based on respective party strengths.
- **Report Presentation:** The Committee presents a report to the House for consideration. A half-hour debate may be permitted while considering the report.
- **Final Orders:** The Speaker may pass final orders or direct that the report be tabled before the House.

- **Resolution:** A resolution relating to the breach of privilege must be unanimously passed.
- **Rajya Sabha:** In the Rajya Sabha, the Deputy Chairperson heads the 10-member Committee of Privileges.

11. National Federation of Indian Women (NFIW) Petition

The Supreme Court has asked the Ministry of Home Affairs and the governments of six states to respond to a petition filed by the National Federation of Indian Women (NFIW).

Lynching

- Lynching is an **extrajudicial killing by a group**.
- It is most often used to characterize **informal public executions** by a **mob** in order to **punish** an alleged transgressor, punish a convicted transgressor, or intimidate people.
- It can also be an **extreme form of informal group social control**, and it is often conducted with the display of a **public spectacle for maximum intimidation**.

What was Tehseen Poonawala Judgment?

- The judgment of the Supreme Court held that it was the "**sacrosanct duty**" of the **state to protect the lives of its citizens.**
- The **court declared** that the **authorities of the States have the "principal obligation"** to see that **vigilantism**, be it cow vigilantism or any other vigilantism of any perception, does not take place.
- The judgment warned that **vigilantes usher in anarchy**, chaos, disorder and, eventually, there is **emergence of a violent society**.

What were the remedial directions given by the SC?

- Appointment of a **designated nodal officer**, not below the rank of Superintendent of Police for taking measures to **prevent prejudice-motivated crimes** like mob violence and lynching.
- The **immediate lodging of an FIR if an incident** of lynching or mob violence comes to the notice of the local police.
- It is the duty of the **Station House Officer** who has registered the FIR to **inform the nodal officer in the district**, who in turn should ensure that the **families of the victims are spared** of any further harassment.
- **The investigation of the crime** should be **personally monitored by the nodal officer** and the investigation and chargesheet are filed within the stipulated period in law.

- There should be a **scheme to compensate victims** of such **prejudice-motivated violence**.
- Any **failure to comply with the court's directions by a police** or district administration officer would be considered as an "**act of deliberate negligence and/or misconduct** for which **appropriate action must be taken against him/her** and not limited to departmental action under the service rules".
- The **departmental action shall be taken to its logical conclusion** preferably within six months.
- **States should take disciplinary action** against their officials if **they did not prevent** the incident an incident of mob lynching, despite having **prior knowledge of it**, or where the incident has already occurred, such official(s) did not promptly apprehend and institute criminal proceedings against the culprit.

12. Why are Rohini panel's findings important?

The Justice G.Rohini led Commission on the sub-categorisation of Other Backward Classes groups has submitted its report to the Government. It was constituted in October 2017.

- **Terms of Reference:**

  -
    - The Justice Rohini Commission was asked to examine how evenly the benefits of reservation have been distributed among the different castes and communities included in the Central list of Other Backward Classes (OBCs).
    - To develop a scientific approach for sub-categorizing OBCs into smaller groups, based on factors such as their social and economic status.
    - To rationalize the Central OBC list by suggesting corrections and replacements in spellings of the different castes, communities, sub-castes, and synonyms in the Central List of OBCs and classify them into their respective sub-categories.

- **Need for Sub Categorisation?**

  -
    - Concerns that benefits of reservation are being utilised by a small number of caste groups.
    - For example, according to some preliminary findings, 97% of all jobs and educational seats have gone to just 25% of all sub-castes classified

as OBCs. 37% of the groups under the Central OBC list have zero representation in jobs and educational institutions.

o The complete details of the report is yet to be released for the general public.

Impact of findings ?

- The Commission's findings will show the data on OBC communities that have availed benefits since reservation for them began in 1992.
- The data set will also show the changes, if any, in the socio-economic status of OBC communities that have historically been able to avail benefits.
- The data will have an impact on political parties who bank on votes from different communities. The issues of development or lack of it in different communities will now have data to justify.

Reasons for delay?

- The Commission was initially given 12 weeks to submit its report, but the government kept giving it extensions.
- The government said that the Commission was taking time because of the COVID-19 pandemic, but it later said that the panel was still working on rationalising the Central OBC list.

13. National Tourism Policy

The Ministry of Tourism has recently drafted a **National Tourism Policy** to enhance contribution of tourism in the Indian economy by making India a **year-round tourist destination**.

National Tourism Policy 2022:

- The **National Tourism Policy 2022** aims to improve the **framework** conditions for tourism development in the country by **supporting** tourism industries, **strengthening** tourism support functions, and **developing** tourism sub-sectors.
- It is a part of the **vision of New India** for high trajectory of growth and prosperity.
- It has incorporated recommendations of **NITI Aayog**, **Sectoral Group of Secretaries**, the United Nations World Tourism Organization (**UNWTO**), among others.
- The **key objectives** of the Policy are:
  o To enhance the **contribution** of tourism in Indian economy by increasing the visitation, stay, spending and making India a year-round tourist destination

o To **create jobs** and entrepreneurial opportunities in tourism sector and ensure supply of skilled work force
o To enhance the **competitiveness** of tourism sector and attract private sector investment
o To **preserve** and **enhance** the cultural and natural resources of the country
o To ensure **sustainable, responsible** and **inclusive development** of tourism in the country.

Indian initiatives to promote tourism:

Adopt a Heritage: Apni Dharohar, Apni Pehchaan

- **Adopt a Heritage: Apni Dharohar, Apni Pehchaan** aims to develop tourism amenities at **heritage** or **natural** or **tourist** sites of India for making them **tourist-friendly**.
- It **encourages companies** from public sector, private sector, trusts, NGOs, individuals and other stakeholders to become **'Monument Mitras'**.
- Under this, **'Monument Mitras'** can take up the responsibility of **developing** and **upgrading** the **basic** and **advanced tourist amenities** at these sites as per their choice.
  o This initiative of **Monument Mitras** can be considered for **Corporate Social Responsibility (**CSR).
- They would also look after the **Operation & Maintenance** of the **monument**.

Swadesh Darshan Scheme (SDS):

- Swadesh Darshan Scheme was **launched** for **integrated development** of **theme-based tourist circuits** in the country.
- Its **objective** was to develop **tourism infrastructure**.
- It was launched by **Ministry of Tourism** in **2014-15**.

Swadesh Darshan2.0:

- The Ministry of Tourism has revamped its Swadesh Darshan scheme as **Swadesh Darshan 2.0 (SD2.0)** for development of sustainable and responsible tourist destinations.
- Its objective is to **increase private sector investment** in tourism & hospitality.
- It may help in **increasing Public Private Partnerships (PPP)** in the field of tourism and operation and maintenance of the created assets under the scheme.

Pilgrimage Rejuvenation And Spiritual Augmentation Drive (PRASAD) Scheme:

- PRASAD scheme aims at developing and identifying **pilgrimage sites** across India for enriching the **religious tourism experience**.
- It aims to **integrate pilgrimage destinations** in a prioritised, planned and sustainable manner to provide a complete religious tourism experience.
- The growth of **domestic tourism** hugely depends on pilgrimage tourism.
- It was launched by the Ministry of Tourism in **2014-15**.

Dekho Apna Desh:

- Under this scheme, a total of **50 destinations** in the **country** were selected to be developed as a **whole package** in **tourism** with a challenging mode.
- This scheme was presented in the **2023 Budget**.
- Dekho Apna Desh aims to **encourage people** to **witness** and **experience** the **rich heritage** and **vivid culture** of **India**.

Chintan Shivir:

- A **Chintan Shivir** was organized by Ministry of Tourism for increasing **investments** and **public private participation** in tourism and hospitality sector.
- **Theme**: Tourism in Mission Mode: Convergence and Public Private Partnership

100% Foreign Direct Investment (FDI):

- In order to attract foreign investment, **100% FDI** is allowed under the **automatic route** in the tourism and hospitality industry in India.
- 100% FDI is allowed in tourism construction projects, including the development of hotels, resorts and recreational facilities.

Travel for LiFE Initiative:

- It aims to promote **sustainable tourism** in the country.
- It is a sectoral program under **Mission Lifestyle for Environment (LiFE)**.
- It is a global initiative launched by Indian Prime Minister at the 26th United Nations Climate Change Conference (**COP26**) in Glasgow, Scotland in **2021**.

14. Commission for sub-categorization of Other Backward Classes (OBCs)

A report of the commission set up to examine the **sub-categorization of Other Backward Classes** (OBCs) was recently submitted to President.

Need for sub-categorization of OBCs:

- OBCs get **27% reservation** in central government **jobs** and admission to **educational institutions.**
- There is a perception that only a few **affluent communities** have benefited from the quota.
- The sub-categorization is needed to **ensure equitable distribution** of the benefits of reservation.

E V Chinnaiah vs State of Andhra Pradesh (2005)

- The SC held that the Scheduled Castes form one **"homogenous" group** and therefore any **inter-se classification** within the Scheduled Castes would be a **violation of Article 14.**

About G Rohini Commission:

- The **Rohini Commission** was constituted to improve the anomalies related to the **benefits of OBC reservation by some selected sections.**
- It was appointed by the **Ministry of Social Justice**, in 2017 and consisted of four members **headed by Justice G. Rohini.**
- It was tasked to **suggest corrective actions** against distortions in the policy benefits related to OBCs.
- It was set up with a tenure of **12 weeks** but was given repeated extensions of up to 6 years.
- The report would have a **direct bearing** on the **electoral calculations** of parties before the Lok Sabha **elections**, but its contents have not been made public as yet.

Terms of reference:

- To examine the extent of **inequitable distribution** of benefits of reservation among the castes or communities included in OBCs concerning such classes included in the **Central List.**
- To formulate **mechanisms, criteria, norms, and parameters** in a scientific approach for sub-categorization within such OBCs.
- To **identify the respective castes, communities, sub-castes, or synonyms** in the Central List and classify them into respective sub-categories.
- To study the entries in the Central List and **recommend correction** of any repetitions, **ambiguities, inconsistencies, and errors** of spelling or transcription.

Key findings of the report:

- It noted the **absence of data** on the population of various communities to compare with their representation in jobs and admissions.
- It asked for a **budgetary provision** for an **all-India survey** to estimate the population of various OBCs but later **refrained** from conducting it.
- It analyzed the data of 1.3 lakh central government jobs under the OBC quota for **preceding five years.**
- Admissions to central higher education **institutions,** and universities like IITs, NITs, IIMs, and AIIMS, over the preceding **three years**.
- **97% of** all jobs and education seats have gone to **25% of OBC castes**, and **24.95% have** gone to just **10 OBC communities**.
- 983 OBC communities (37%) **had zero representation** in jobs and educational institutions.
- 994 OBC sub-castes had a representation of only **2.68%** in recruitment and admissions.
- This analysis suffered from **limitations** due to the absence of updated population data due to delays in **Census 2021.**

15. Simultaneous Elections

In the recent monsoon session, the Law Ministry has talked about the potential benefits of simultaneous election.

What is simultaneous election?

Article 324 constitutes Election Commission which is responsible for conducting polls to the offices of the President and Vice-President of India, Parliament, the state assemblies and the legislative councils.

- Simultaneous Elections refers to structuring the Indian election cycle by synchronizing the elections to Lok Sabha and State Assemblies.
- **One nation One election-** It means that the voters will cast their vote for electing members of the Lok Sabha and the state assemblies on a single day, at the same time or in a phased manner as the case may be.
- **Current scenario-** The elections to the state assemblies and the Lok Sabha are held separately (whenever the incumbent government's 5-year term ends or whenever it is dissolved).

What is the history behind simultaneous election?

- **Dissolution** Simultaneous elections were the norm until 1967. It was disturbed by the dissolution of
  - Some Legislative Assemblies in 1968 and 1969 and
  - Lok Sabha in 1970
- **Revert to simultaneous election-**The idea of reverting to simultaneous polls was mooted by
  - Election Commission annual report in 1983
  - Law Commission report in 1999 and 2018
  - NITI Aayog working paper in 2017

Key Recommendations of Law Commission Report 2018
- The report examined legal and constitutional questions related to the conduct of simultaneous elections.   **5 Constitutional recommendations**   - Appropriate amendments to Constitution and Representation of People Act 195   - To replace no confidence motion with the constructive vote of no confidence.   - In case of hung assembly the President/ Governor should give an opportunity to the largest party along with their pre or post-poll alliance to form the government.   - Proper amendment to Anti defection law 1985.   - Framework to synchronise elections.

What are the advantages of simultaneous elections?

- **Reduce election expenditure-**
  - Cost reductions for political parties and candidates during their election campaigns.
  - Economic costs associated with Model Code of Conduct.
  - Cost savings for public.
  - Intangible costs due to lack of leadership as ministers focus on elections

A NITI Aayog paper says that the country has at least one election each year; each state has an election every year.

- **Reduce the manpower-** It prevents the duplication of efforts by administrative and law enforcement agencies in conducting multiple elections.
- **Improve governance-** The system will help ruling parties focus on governance, instead of being constantly in election mode.

- It reduces the distractions from long-term planning and policy goals.
- **Boost voter turnout-** According to the Law Commission, it increases voter participation.
- **Improve administration**- It will increase the focus of administrative machinery on nation to remain consistently focused on developmental effort.
- **Reduce policy paralysis**- This system will lead to minimised disruption of essential services.

United Kingdom- The term of Parliament in the UK is regulated by the *Fixed-term Parliament Act of 2011.*

South Africa- It holds elections for national and provincial legislatures simultaneously for a duration of 5 years, while municipal elections are conducted 2 years later.

Sweden- In a specific date (2nd Sunday in September every 4 years) elections for the national legislature, provincial legislature council and local bodies/municipal assemblies are conducted.

International practices

What are the issues with simultaneous elections?

- **Against federalism-** It undermines the fundamental tenet of federalism, which constitutes an integral component of our Constitutional framework.
- **Tenure -** Synchronisation would involve curtailment or extension of the tenure of a House.
- **Constitutional challenges -** The move requires amendment to the Representation of Peoples's Act 1951 and the Constitution's basic structure, posing a challenge.
- **Multiple amendments-** It requires amendment in five Articles of the Constitution, namely Articles 83, 85, 172, 174, and 356.

- **Practical difficulties -** The Election Commission sometimes holds elections to even one state in many phases.
- Given this, holding simultaneous elections for the whole country has many practical difficulties.
- **Dissolution challenges** - It is possible for Lok Sabha to be prematurely dissolved on account of a vote of no-confidence.
  - o **Example**- Atal Bihari Vajpayee's government faced dissolution within 13 days of taking power.
- It raises the question of whether new elections would be required in all 29 states, even if the ruling party holds an absolute majority in those states in case of simultaneous elections.
- **Impact on regional parties-** It will benefit the dominant national party or the incumbent at the Centre while disadvantaging the smaller regional party and issue.

What lies ahead?

- There must be a mechanism for the measures that can be taken to ensure that simultaneous polls provide equal opportunities for regional parties in comparison to national parties.
- There is a need to work on drawbacks before implementing One Nation One Election.

16. 15th BRICS Summit

15th BRICS Summit is set to be held in Johannesburg from 22-24 August 2023.
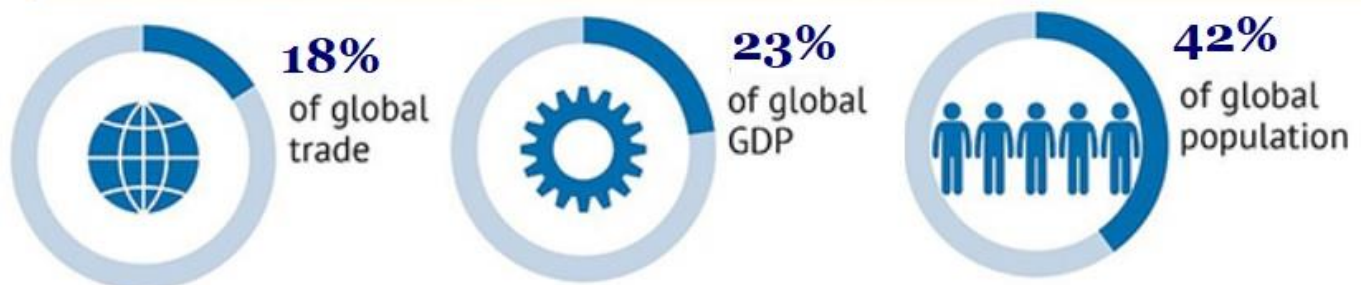
BRICS

- Originally conceived as BRIC by Jim O'Neill, the grouping consisted of Brazil, Russia, India, and China.
- **Launch-** It was launched by a meeting of the Foreign Ministers of Brazil, Russia, India and China in 2006.
- BRIC turned into BRICS in 2010, with the entry of South Africa.
- **Current Members-** Brazil, Russia, India, China and South Africa.

- **Chair-** Chaired by member countries in rotational basis.
- South Africa is the chair for 2023.
- **First summit-** It was held in Yekaterinburg in 2009.

BRICS countries make up

18% of global trade   23% of global GDP   42% of global population

What is the need for BRICS?

- **New world order-** It aims to assert their position particularly in relation to the United States and the European Union.
- **Multipolar global order-** It promotes the recognition of a multipolar global order with economic and political balance.
- It aims to break away from organisations formed in the post-World War II era, such as the World Bank and the International Monetary Fund.
- **De-dollarization-** BRICS account for 18% of the world trade, supports the increased use of members' national currencies for trade and the introduction of a common payment system in the long term.

- **Global South**- It helps in representation from voices of the 'Global South', a term used to refer to countries that have not traditionally been at the centre of international agenda-setting.
- **Economic rise**- In recent decades, India and China witness economic rise. The creation of their own forums has been utilised as an alternative.
- **Financial structure**- New Development Bank (NDB), the Shanghai-headquartered bank has since invested $30 billion in infrastructure development projects.

In Fortaleza declaration, New Development Bank was created in 2015 worth 100 bn dollars.

What is the significance of 15th BRICS Summit?

- It is the first in-person summit since 2019, which meets at an important geopolitical and geo-economic moment.
- It is first in-person meeting since the Russian invasion of Ukraine in 2022.
- **Agenda**- 'BRICS in Africa: Partnership for Mutually Accelerated Growth, Sustainable Development and Inclusive Multilateralism'.
- **Participation in dialogues**-
    o BRICS-Africa Outreach
    o BRICS Plus Dialogue
- **Develop partnership**-
    o Equitable just transition, including risks associated with climate change,
    o Transforming education and skills development for the future,
    o Strengthening post-pandemic socioeconomic recovery
    o Attainment of the 2030 Agenda on Sustainable Development.
- **Discuss political issues**-
    o Russia- Ukraine conflict
    o Post-coup scenario in Niger
    o Increased tension between the West and Russia.
- **Economic reforms**- It is expected to advance the cause of
    o Emerging Markets and Developing Countries (EMDCs) gaining more space in international economic decision-making
    o Reform of Multilateral Development Banks (MDBs) and relief for debt stress
    o Unlocking opportunities through the African Continental Free Trade Area.
- **Expand BRICS**- It is seen as an attractive alternative to the G-7 developed countries "club".
- More than 40 countries have shown an interest in joining BRICS, and at least 19 countries have applied formally for membership.

- **Wider participation**- South Africa has invited African Union (AU) and about 20 other leaders who represent the Global South for sessions on the sidelines of the summit.

What is the significance for India?

- **Multi-alignment-** It is an issue-based alignment strategy, which aims to simultaneously participate and pursue its interests in multiple strategic and economic coalitions, such as the Quad and BRICS.
- **Reflect multidirectional foreign policy**- It strengthens economic prosperity, technology advancements, research and innovation, norm influencing, and strengthening security.
- **Diplomacy-** It allows India to pursue a development focused diplomatic engagement which aims at increasing the membership of BRICS.
- **Broader agenda**
  - o Energy security
  - o Combating terrorism
  - o Climate change financing
- **Geopolitical force**- BRICS attempts to amplify non-traditional security threats and promote economic security within the forum.
- **Political push-** It would be a political push against unfair coercive practices
  - o European Union's Carbon border tax
  - o Economic transaction and
  - o Unilateral sanction
- **Strategic interest-** It is the first in-person summit since the military standoff with China at the Line of Actual Control in 2020.
- Ahead of summit, 19th round of India-China Corps Commander Level Meeting resulted in a joint statement is a positive sign.

17. Causing floods is a terrorist offence in law proposed to replace the Indian Penal Code

The proposed Bharatiya Nyaya Sanhita Bill (BNS) introduces causing "floods" as a terrorist offence, seeking to replace the Indian Penal Code. This move raises concerns about procedural safeguards.

Bharatiya Nyaya Sanhita Bill (BNS) Proposal

- BNS Bill classifies causing "floods" as a terrorist offence, aiming to replace British-era Indian Penal Code.

- Terrorism is defined as a separate offence for the first time within general law in contrast with the Unlawful Activities (Prevention) Act, 1967, which focused on terrorist activities.

Definition and Scope of Terrorism

- Section 111 (6) (a) of the Bill defines "terrorist" as a person involved in various activities, including causing floods.
- The Bill, introduced on August 11 during the Monsoon Session of Parliament, has been referred to the Parliamentary Committee on Home Affairs for examination.

Lack of Procedural Safeguards

- The proposed law lacks procedural safeguards against false implications in terrorism and organised crime, just as is the case with UAPA and the Maharashtra Control of Organised Crime Act (MCOCA).
- UAPA is known for its draconian provisions and has led to 4,690 arrests (2018-2020) with only 3% convictions.

Missing Safeguards and Implications

- The proposed law bypasses safeguards and any police officer can register FIR labelling an individual as a terrorist.
- MCOCA and UAPA require senior police officer approval for FIRs, specific investigative ranks, and government sanctions for court cognizance. Similar safeguards are missing in the proposed law.

Real-World Case and Controversy

- The 2022 flood incident in Silchar, Assam led to criminal case registration; floods claimed over 120 lives.
- The Assam CM attributed floods to human action; accusations against one particular community led to social media uproar ("flood jihad").

Proposed Punishment and Safeguard Comparison

- Section 111 proposes minimum five-year imprisonment and the death penalty for terrorist offences.

18. The Need for BRICS Expansion and Common Currency

BRICS expansion and common currency are the top of the agenda in 15th BRICS summit held in South Africa.

BRICS

New Development Bank was launched in 2014 through Forteleza declaration.

- Originally conceived as BRIC by **Jim O'Neill,** the grouping consisted of Brazil, Russia, India, and China.
- **Representation -** It together represent 30% of the world's territory, and 42% of the world's population, 23% of global GDP, and 18% of Global trade.
- **Launched -** By a meeting of the Foreign Ministers of Brazil, Russia, India and China in 2006.
- **First summit -** It was held in Yekaterinburg in 2009.
- BRIC turned into BRICS in 2010, with the entry of South Africa.
- **Current members -** Brazil, Russia, India, China and South Africa.
- **Chair -** BRICS is chaired by member countries in rotational basis.
- South Africa is the chair for 2023.

What is the need for BRICS expansion?

19 countries are seeking for BRICS admission

- **East-West confrontation-** The Russia-Ukraine War and the intensifying China- USA conflict has made it necessary to expand the network of friends and partners, thus consolidating their camps.

- **BRICS Plus-** It is a cooperation mechanism launched in Xiamen summit 2017 to enlarge BRICS beyond 5 members.
- **BRICS NDB-** It has already inducted members such as United Arab Emirates, Uruguay, Bangladesh, and Egypt into its fold and many others are also willing to join.
- **Health diplomacy-** Establishment of vaccine research and development center in 2022 to cope up with the COVID 19 pandemic further led to deepening of "BRICS Plus" cooperation.
- **Demand from "node" countries-** These countries have considerable influence and important strategic positions. Without the active participation of these node countries, BRICS Plus cooperation will lack a vast hinterland, making it difficult to sustain or become bigger and stronger.
- **New world order-** It aims to assert their position particularly in relation to the United States and the European Union.
- **Investment-** As per UN report, the growth rate of intra-BRICS exports and the level of foreign direct investment into BRICS countries is above the global average.

The View of Major Countries on BRICS expansion	
China	Counters USA at functional level
Russia	Wants to overcome international isolation due to Ukraine-Russia war
India and Brazil	They fear of China's dominancy India favours the expansion through a consensus based approach
South Africa	Wants to discuss the criteria for admission of new members
Saudi Arabia	Sees this as an opportunity to expand its market

Why BRICS push for common currency?

'The Cape of Good Hope', the joint statement of BRICS, underscores the use of local currencies in international trade and financial transactions between BRICS and its trade partners.

- **Alternative transfer mechanism-** In 2022, Russia put forward an international reserve currency mechanism to counter crippling sanctions levied by European Union, USA, UK etc.,
- **Buffer for western sanctions-** As it impacts the basic principles of
    o Market economy
    o Free trade and
    o Inviolability of private property

- **Counter western dominance-** The aim is to globally realign the geopolitical situation to suit its member nations' economic, geographic and demographic advantages.
- **Push for local currency-** RBI has allowed 18 countries to trade in rupees with India.
  - o **Rupee Dirham deal-** It aims to interlink the two nations' payment and messaging systems as well as increase the circulation of the rupee in the Gulf region.
  - o **Rupee Rouble arrangement** has already done by Russia and India, but later dropped due to expensive currency conversion
  - o **China trades in Yuan** with over 120 countries.
- **BRICS pay-** It is a decentralised multi-currency digital international payments system that was launched in 2018.
- It aims to enable digital payments between the different countries in BRICS PLUS format, allowing businesses and consumers to securely and seamlessly make and receive payments in their local currency.

19. Special Provisions of NE States under Article 371

- The Supreme Court recently assured that special constitutional provisions protecting the interests of northeastern states under Article 371 will remain untouched.
- As the Constitution Bench deliberates the challenge to Article 370's abrogation in Jammu and Kashmir, we delve into the significance of these assurances and their implications.

Article 371

- Article 371 of the Indian Constitution grants special provisions to various states to protect their unique cultural and tribal identities.
- These provisions are aimed at preserving local customs, social practices, and land ownership.

Preserving Tribal Culture

- **Context:** Article 371 provides special provisions for several states, particularly in the northeast, to safeguard their tribal cultures and unique identities.
- **Article 371(A) – Nagaland:** Article 371(A) ensures that acts of Parliament do not apply to Nagaland concerning Nagas' religious and social practices, customary law, civil and criminal justice based on Naga customary law, and land and resource ownership.
- **State Assembly's Role:** These provisions only apply to Nagaland after the State Assembly passes a resolution to that effect.
- **Development Impediment:** Some stakeholders, like Neikiesalie Nicky Kire of the NDPP, argue that Article 371(A) hampers development by preventing the government from carrying out development activities due to landowner preferences.

Similar Provisions in Other States

- **Article 371-G – Mizoram:** Similar to Nagaland, Article 371-G provides special provisions for Mizoram to protect Mizo religious and social practices, customary law, civil and criminal justice, and land ownership.
- **Article 371B – Assam:** Article 371B facilitates the creation of the sub-state 'Meghalaya,' aiming to provide special provisions with respect to Assam.

State-Specific Provisions

- **Article 371C – Manipur:** This article addresses special provisions for Manipur, a state that was formed in 1972.

- **Article 371F and 371H – Sikkim and Arunachal Pradesh:** These articles discuss special provisions for Sikkim and Arunachal Pradesh, respectively, to address their unique needs.
- **Article 371 – Separate Development Boards:** Article 371 empowers the President to establish separate development boards for specific regions within Maharashtra, Gujarat, and Andhra Pradesh, promoting balanced growth.

Further State-Specific Provisions except NE

- **Articles 371D and 371E – Andhra Pradesh, Karnataka, Goa:** These articles provide special provisions for these states to ensure their cultural and economic development.
- **Articles 371J and 371I – Karnataka and Goa:** These articles grant special provisions to Karnataka and Goa, respectively, to address their specific requirements.

20. Social Security in India

India needs a well-crafted social security to all its work force, in a manner that is fiscally and administratively feasible.

Status of Social Security in India
Data- Around 53% of all of the salaried workforce does not have any social security benefits in India, according to the Periodic Labour Force Survey Annual Report 2021-22.   - It is just 1.9% of the poorest 20% quintile of India's workforce has access to any benefits.   **Gig workers-** "India's Booming Gig and Platform Economy" report by Niti Aayog found that around 7.7 billion workers are engaged in workforce (1.3% of India's active labour force), but rarely have access to any social security benefit.   **Informal sector-** Around 91% of India's workforce works in the informal sector.   **Rank-** India's social security system rank in Mercer CFS is 40 out of 43 countries in 2021.

What is the need for social security?

International Labour Organization (ILO) defines social security as protection which society provide for its members through a series of public measures, against the economic and social distress.

- **Buffer against social risk-** Social security is an instrument for social transformation and progress as per International Labour Organisation.
- It helps people to plan their own future through insurance and assistance.
- **Medical treatment**- It is required when an employee falls sick.
- It helps to provide monetary support for treatment and family maintenance during the absence of work.
- **Maternity benefit**- Women employees need help and support for their sustenance.
- **Work accident**- Compensation scheme under social security measures may save the employees and their families from ruining.
- **Old age** -They need retirement benefit as during such time they lose their ability to perform work and cannot earn.
- **Security against layoff**- Social security helps the retrenched employees to restart their way of life.
- **Develop organization**- A sense of belongingness, 'we feeling', 'togetherness', amongst employees is developed which helps to achieve team goals and organizational goals.
- **Motivation -** It inspires employees to give more attention on their production and services than on activities like planning for future employment, sorting out medical issues etc.

How about the international practice on social security?

- **ILO-** It was established under the treaty of Versailles in 1919 for the need of social security right to workers.
  - **1944 resolution**- Extension of social security measures
  - **Convention 102-** Minimum standards of social security was adopted in 1952.
- **Germany-** It is the first European industrial nation to start a social security programme that was extended to people other than military forces
- **Brazil-** Brazil's General Social Security Scheme is contribution-based, substituting income loss for a worker (and his family), whether in partial or full.

What steps were taken by India to promote social security?

Constitutional Provisions
- **Concurrent list-**
o Social Security and insurance, employment and unemployment.
o Welfare of Labour- work conditions, provident funds, employers' liability, workmen's compensation, invalidity and old age pension and maternity

benefits.

- **Article 41-** It directs the state to secure the right to work, education and public assistance in certain cases such as unemployment, old age, sickness and disablement.
- **Article 42-** It deals with the provisions for just and humane conditons of work and maternity relief.
- **Article 43-** Participation of workers in the management of industries.

Legislations

- **The Employees' State Insurance Act, 1948**- It covers factories and establishments with 10 or more employees and provides for comprehensive medical care to the employees and their families as well as provides cash benefits.
- **The Employees' Provident Funds & Miscellaneous Provisions Act, 1952 -** It applies to specific scheduled factories and establishments employing 20 or more employees and ensures terminal benefits to provident fund, superannuation pension, and family pension in case of death during service.
- **The Employees' Compensation Act, 1923 -**It requires payment of compensation to the workman or his family in cases of employment related injuries resulting in death or disability.
- **The Maternity Benefit Amendment Act 2017**- It extends the paid maternity leave from 12 weeks to 26 weeks.
- **The Payment of Gratuity Act, 1972** - It provides 15 days wages for each year of service to employees who have worked for 5 years or more in establishments having a minimum of 10 workers.
- **Code on Social Security in 2020-** It provides for a statutory framework to enable social security for the urban and rural poor, construction workers, those in the gig industry and informal sector workers.

Schemes

- **Pradhan Mantri Shram Yogi Maan-Dhan Yojana -** Launched in 2019, it is an old age protection, voluntary and contributory pension scheme for unorganised workers.
- **Pradhan Mantri Jeevan Jyothi Yojana**- It is a government-backed life insurance scheme in India launched in 2015.
- **Pradhan Mantri Suraksha Bima Yojana** - It is a government backed accident insurance scheme launched in 2015 at Kolkata.
- **Atal Pension Yojana**- It is a government-backed pension scheme in India, launched in 2015 which primarily targeted the unorganised sector.

- **E-Shram portal-** A push for greater digitisation under the e-Shram platform has enabled the enrolment of approximately 300 million workers while expanding coverage of accident insurance (of Rs 2 lakh cover) and disability (of Rs 1 lakh cover).

What steps need to be taken?

It is estimated that the cost of providing social protection to the poorest 20% of the workforce would be Rs. 1.37 trillion — a cost of approximately 0.69% of GDP in FY20.

- **Formal workers**- There is a need to expand employer and employee contribution under the Employees' Provident Fund Organisation (EPFO) system for formal workers.
- **Informal workers-** There is a need to make social security entitlements mandatory and not voluntary for informal workers.
- **Incentives-** There is a need to provide incentive to employer to foster registration which would enable the formalisation of employee-employer relationships.
- **Expand schemes**- India needs to strengthen existing schemes, for with budgetary support and expansion of coverage.
- **Special attention -** It is required for female domestic workers and migrant workers who often face discrimination.
- **Improve fund**- Organisations such as the Self-Employed Women's Association which run Shakti Kendras (worker facilitation centres), may be funded to run campaigns to provide greater information on social security rights.

21. BRICS inducts 6 new members to become BRICS Plus

- The BRICS alliance, consisting of Brazil, Russia, India, China, and South Africa, has extended invitations to six additional countries, namely Iran, the United Arab Emirates, Saudi Arabia, Argentina, Egypt, and Ethiopia.
- This move aims to bolster the collective voice of the Global South and foster multipolarity in the international arena.

Why discuss this?

- As BRICS broadens its membership, it strengthens its claim to represent nearly half the world's population and includes key oil-producing nations.

- However, concerns also arise regarding China's increasing influence within the alliance.

BRICS Plus: Emerging Role

- **Heft and Influence:** The inclusion of new members enhances BRICS's position as a spokesperson for the developing world. The alliance currently represents 40% of the global population and over a quarter of the world's GDP. With the addition of new members, it will encompass almost half the world's population and include major oil-producing nations.
- **Global Solidarity:** BRICS's growth is driven by anti-US sentiment and a desire for multipolarity among countries in the Global South. It serves as a platform where nations can express solidarity and challenge Western-dominated narratives.

BRICS: Evolution and Geopolitical Context

- **Emergence of BRICS:** Established in 2009, BRICS initially comprised Brazil, Russia, India, and China, with South Africa joining in 2011. The alliance aimed to showcase the economic potential of these emerging markets.
- **Challenges and Opportunities:** While BRICS's economic performance has varied, geopolitical shifts like the Ukraine conflict have propelled it into a bloc with the potential to challenge Western influence and provide an alternative viewpoint.

Dynamics of New BRICS Members

- **Unanimous Decisions:** BRICS decisions require unanimous agreement from all members. While Russia and China face geopolitical challenges with the West, Brazil, South Africa, and India maintain significant partnerships with the US and Europe.
- **China's Role:** China is driving BRICS's expansion, making membership expansion a core agenda item.
- **Inclusion of Iran:** China and Russia's influence is evident in the inclusion of Iran, highlighting their collaboration. This move brings together regional rivals Saudi Arabia and Iran within the same alliance, reflecting China's mediation efforts.
- **Saudi Arabia's Shift:** Saudi Arabia's inclusion marks its pursuit of a more independent foreign policy, diverging from its traditional US alliance.
- **Global Significance for Iran and Russia:** For Iran and Russia, BRICS membership signifies their global partnerships and challenges to Western dominance.

Implications for India

- **Balancing Act:** India's participation in the G7 summit and Quad summit reflects its multifaceted foreign policy approach. While engaging with Western alliances, India also places importance on its "anti-Western" stance within BRICS.
- **BRICS as a Non-Western Bloc:** India views BRICS as a "non-Western" group and strives to maintain its independent voice within the alliance.
- **Concerns for India:** Amid expansion, there are concerns that BRICS could tilt more toward China, potentially side-lining India's interests.

Conclusion

- BRICS's expansion signifies a step toward global multipolarity, providing a platform for diverse countries to unite against Western-centric narratives.
- As the alliance grows, it gains greater representation and influence, strengthening the collective voice of the Global South.
- However, with China's increased influence, there are also legitimate concerns about the balance of power within BRICS and its impact on individual member states.

22. Scholarship Schemes for Religious Minorities

The Centre discontinued two key educational schemes for religious minorities, and cut down on the expenditure incurred on multiple programmes of the Ministry of Minority Affairs.

Why were the scholarship programs for religious minorities introduced?

- **Rajinder Sachar Committee -** It was constituted in 2005 to look into the social, economic and educational standing of the Muslims in India.
- **Report -** It concluded that the minority was deprived and neglected in almost all dimensions of development and behind the mainstream in several social and economic sectors.
- Muslims rank somewhat above SC/ST but below Hindu OBCs, Other Minorities and Hindu General in almost all indicators considered.

Scheme	About	Status
Pre Matric Scholarship Scheme	It is awarded to minority students from class 1 to 10.	The scheme now only covers class 9 and 10.
Post-Matric Scholarship Scheme	It is given to students of class 11 to Ph.D.	The funds increased during this fiscal year.

Merit-cum-Means based Scholarship Scheme	It targets professional & technical courses at UG & PG levels.	The scholarship scheme saw a major reduction in funds in 2023-24.
Maulana Azad National Fellowship	The scheme provided financial assistance to research scholars pursuing M.Phil and Ph.D.	The scheme was scrapped in 2022.
Padho Pardesh	It was launched to provide better opportunities for higher education abroad.	The interest subsidy scheme was discontinued from 2022-23.
Begum Hazrat Mahal National Scholarship	It is awarded for meritorious girls for higher secondary education.	The scholarship had zero allocation this year.
Naya Savera	It provides free coaching to minority students for competitive examinations.	The scheme saw a drop in budget.
Nai Udaan	It supported minority students preparing for competitive exams.	No funds were allocated in the ongoing financial year.
Pradhan Mantri Jan Vikas Karyakram	The Scheme provides infrastructure in identified minority concentration areas.	Reduction of fund allocation.

- **New Ministry -** In 2006, the Ministry of Minority Affairs was carved out of Ministry of Social Justice and Empowerment.
- **Mandate -** To formulate policy & planning, coordination, evaluation & review of the regulatory framework & development programmes for the benefit of the minority communities.

What are the welfare schemes for the educational empowerment of minorities and their status?

How the schemes have impacted the beneficiaries?

- **Drastic fund decline** - Scholarships awarded to minority students steadily increased from roughly 75,000 to over 70 lakh between 2006 and 2013.
- **Data analysis** - It shows that beneficiaries of the first six central educational schemes mentioned above dropped by around 7% in three years, between 2019 and 2022.
- **Worst hit** - The Maulana Azad National Fellowship and the Begum Hazrat Mahal National Scholarship took the biggest hit during this period.
- **Drop in educational aid -**

1. **Pre-matric scholarship**, which has benefitted the maximum number of minority students.
2. **The merit-cum-means scholarship** for professional and technical courses, one of the few schemes that saw a rise in the number of beneficiaries also faced funding cuts this year.
3. **Grants-in-aid** to the Maulana Azad Education Foundation, established to promote education among educationally backward minorities also dropped.

Why does educational aid need to be strengthened?

- **Education gap -** It is due to reduced budgetary allocation and underutilisation of funds.
- **Disparity in education accessibility -** There is a significant disparity in education accessibility between Muslims and the general population.
- **Decreased enrolment rate -** Scrapping scholarships and limiting the scope of others affect the community and impact their enrolment rate.

As per Sarva Shiksha Abhiyan Data the highest proportion of out-of-school children in the country belong to Muslim communities (4.43%), followed by Hindus (2.73%), Christians (1.52%) and others (1.26%).

What lies forward?

- **Niti Aayog -** It suggested enhancing pre-matric, post-matric and merit-cum-means scholarships as well as the Maulana Azad National Fellowships and national overseas scholarships.
- It recommended a 15% annual increase from 2019-20, also increasing the number of scholarships for girls from minority communities by 10% every year.
- **Scholarships -** It should be made demand-driven, along with additional financial resources to enhance unit costs.

23. Tamil Nadu vs. NEET: Balancing Equity and Autonomy

- The conflict between Tamil Nadu and the Centre over the National Eligibility and Entrance Test (NEET) has intensified.
- It has reignited discussions about the transfer of education back to the State List of the Seventh Schedule of the Constitution.

- **Educational Autonomy:** Chief Minister M.K. Stalin called for education's transfer back to the State List, originally placed in the Concurrent List during the Emergency.

- **NEET Controversy:** Tamil Nadu's opposition to NEET escalated dramatically after the tragic suicides of a student and his father due to exam-related stress.

Why Tamil Nadu Opposes NEET?

- **Undue competition:** NEET, a centralised entrance exam for medical courses, faces opposition in Tamil Nadu due to its mechanical focus on marks.
- **Impact on Local Models:** NEET disrupted models like Christian Medical College (CMC) Vellore, known for emphasizing aptitude over marks.
- **In-Service Quota Impact:** NEET dismantled Tamil Nadu's in-service quota for medical graduates, adversely affecting healthcare quality.
- **Disadvantages Marginalized:** The exam favours affluent sections who affords lakhs worth coaching (esp. repeaters), disadvantaging underprivileged groups and hindering their aspirations.

Emotive Nature of the Issue

- **Equity and Social Justice:** Opposition to NEET is deeply rooted in demands for educational equity and autonomy, driven by social justice concerns.
- **Kamaraj's Vision:** Tamil Nadu's education vision, shaped by Chief Minister K. Kamaraj, emphasized accessibility and empathy for unlettered masses.

Legislative Struggles

- **AIADMK Bills:** The previous AIADMK government introduced Bills in 2017 seeking state autonomy in medical admissions. They were returned by the President.
- **Stalin's Efforts:** In 2021, CM M.K. Stalin's government passed the Tamil Nadu Admission to Undergraduate Medical Degree Courses Bill, 2021, aiming to abolish NEET and base admissions on Class 12 marks for social justice.
- **Governor's Opposition:** Governor R.N. Ravi, opposed to the anti-NEET Bill, delayed its forwarding to the President, leading to political tensions.

Justice A.K. Rajan Committee

- **Committee Formation:** The Justice A.K. Rajan Committee was established in 2021 to assess NEET's fairness in medical admissions.
- **Critical Findings- Rich vs. Poor:** The committee criticized NEET for favouring repeaters and coached students while disadvantaging first-time applicants, leading to reduced admissions among marginalized groups.

Why is TN now fuming?

- **Concurrent List:** Medical course admissions fall under the Concurrent List (Entry 25), allowing states to legislate on these matters.
- **Amending Central Laws:** States can enact laws related to admissions and amend central laws on admission procedures, as long as they don't contradict parliamentary laws.

Current Scenario

- **Historic Public Health Practices:** Tamil Nadu's public health infrastructure thrived on retaining PG doctors, indicating the state's effective healthcare practices.
- **Balancing Uniformity and Fairness:** The NEET stalemate reflects the challenge of balancing uniformity with local values and needs.
- **Clash of Values:** The conflict highlights the broader tension between central standardization and local autonomy, revealing deeper debates about democracy, equality, and social justice in India.

Conclusion

- The NEET controversy in Tamil Nadu is not merely about an entrance exam; it represents a larger struggle for educational equity, autonomy, and social justice.
- The state's commitment to its unique vision of education and healthcare clashes with central standardization, sparking a crucial dialogue about the nature of democracy and fairness in the country.

24. Deconstructing Gender Stereotypes: The Supreme Court's Handbook

- The Supreme Court of India has taken a significant step to challenge outdated ideas, especially those affecting women, by releasing a special guide.
- This guide introduces new words for lawyers and judges to use in court, aiming to fight harmful beliefs.

Handbook on Combating Gender Stereotypes

- The handbook provides a list of biased words and suggests better alternatives for legal documents.
- Its main aim is to provide legal experts with the means to "identify, understand, and challenge stereotypes about women."
- It includes a list of terms that promote gender bias and offers alternative, fairer terms to be used in legal documents.

Objective and Scope of the Handbook

- **Challenging Old Beliefs:** The Supreme Court's initiative aims to discard old-fashioned and harmful stereotypes, particularly those related to women, through the 'Handbook on Combating Gender Stereotypes.'
- **CJI's Vision:** The handbook is introduced by Chief Justice D.Y. Chandrachud, who explains its purpose: to help legal professionals recognize and counter gender-based stereotypes.
- **Language Transformation:** The handbook includes a glossary of terms that contribute to gender bias and suggests better alternatives to be used in legal writings.

Why such a move?

[A] Language inflicting Stereotypes

- The handbook points out terms in legal language that promote gender bias and provides suggestions for change.
- **Examples of Change:** Instead of using "adulteress," the handbook recommends using "Woman who has engaged in sexual relations outside of marriage" to avoid disrespectful language.
- **Removing Biases:** The handbook encourages using simple terms like "woman" and "wife" instead of prefixes like "chaste" or "obedient."
- **Using Neutral Language:** Instead of negatively using "effeminate," the handbook suggests using neutral terms like "confident" or "responsible."

[B] Avoiding labelling

- **Empowering Language:** The handbook suggests using "survivor" or "victim" to describe individuals affected by sexual violence.
- **Respecting Preferences:** The choice between "survivor" and "victim" should be based on the individual's preference.

[C] Conscious Reporting of Cases

- **Separating Attire and Consent:** The handbook emphasizes that a person's clothing should never excuse unwanted touching; consent remains essential.
- **Breaking Stereotypes:** The handbook rejects the idea that delayed reporting of sexual assault means it didn't happen.
- **Encouraging Reporting:** The handbook acknowledges the bravery required to report sexual offenses due to societal pressures.

Negative Effects of Gender Stereotypes

- **Widespread Impact:** Gender stereotypes lead to exclusion and prejudice in workplaces, schools, and public places.
- **Education Example:** The handbook illustrates how stereotypes affect students from marginalized communities, adding stress during exams.
- **Government Data:** Minister Subhas Sarkar's data on dropout rates among marginalized students is shared as an example.

Legal reforms rebutting Gender Stereotypes

- **Cases for Equality:** The Supreme Court points out cases that reject stereotypes, like Joseph Shine vs. Union of India, which struck down the "adultery" law.
- **Example Rulings:** The court's decisions in cases like the State of Jharkhand vs. Shailendra Kumar Rai and the State of Punjab vs. Gurmit Singh are explained.

Conclusion

- By offering alternatives to outdated and biased language, the handbook aims not only to reshape legal discussions but also societal viewpoints.
- Its potential impact is anticipated to extend beyond legal matters, influencing everyday perspectives and contributing to a more equitable society.

25. India launches Global Initiative on Digital Health (GIDH)

- In a significant stride towards global healthcare innovation, the World Health Organization (WHO) and India's G20 presidency have jointly unveiled the 'Global Initiative on Digital Health' (GIDH).
- The announcement was made at the Health Minister's Meeting during the G20 Summit, hosted by the Indian Government.

GIDH

- **WHO and G20 Partnership:** The WHO and India's G20 presidency collaboratively introduced the 'Global Initiative on Digital Health' (GIDH).
- **Strategy Implementation:** GIDH functions as a WHO-managed platform, supporting the implementation of the 'Global Strategy on Digital Health 2020–2025.'
- **Transformation Acceleration:** The WHO, as the strategy's Secretariat, facilitates the global convergence of standards, best practices, and resources for expediting digital health system transformation.

Objectives of the GIDH Initiative

- **Measurable Outcomes:** GIDH aspires to unite nations and partners, aiming to achieve tangible results through concerted efforts.
- **Prioritizing Investment Plans:** The initiative seeks to establish focused investment plans for the transformation of digital health, driven by clear priorities.
- **Enhancing Resource Transparency:** GIDH works towards greater transparency in reporting digital health resources, ensuring effective resource allocation.
- **Facilitating Global Collaboration:** The initiative fosters the exchange of knowledge and collaboration among regions and countries to expedite progress.
- **Comprehensive Governance:** GIDH supports holistic government approaches to digital health governance within countries.
- **Boosting Support:** The initiative aims to enhance both technical and financial support for the implementation of the 'Global Strategy on Digital Health 2020–2025' and its forthcoming phase.

India's Role and Vision

- **Digital Health Innovation:** India's G-20 Health Minister emphasized India's role in digital health innovation at the G-20 Health Ministers' Meeting.
- **National Digital Health Architecture:** India's efforts for a comprehensive digital health ecosystem, exemplified by the Ayushman Bharat Digital Mission (ABDM), were highlighted.

26. The BRICS test for India's multipolarity rhetoric

- India's pivotal role in the upcoming BRICS summit in South Africa from August 22 to 24 underscores its evolving diplomatic challenges and potential impact on global geopolitics.

- The global geopolitical stage is once again witnessing the active participation of India. With the BRICS (Brazil, Russia, India, China, and South Africa) summit around the corner, India finds itself at a crucial juncture of international diplomacy. This summit not only tests the waters of Indian diplomacy but also holds clues to the trajectory of global geopolitics.

All you need to know about BRICS

- BRICS is an acronym for the grouping of the world's leading emerging economies, namely Brazil, Russia, India, China, and South Africa.

- Jim O'Neill, a British economist, coined the term 'BRIC' to describe the four emerging economies of Brazil, Russia, India, and China. He made a case for BRIC on the basis of econometric analyses projecting that the four economies would individually and collectively occupy far greater economic space and become among the world's largest economies.
- The importance of BRICS is self-evident: it represents 42% of the world's population, 30% of the land area, 24% of global GDP, and 16% of international trade.
- The five BRICS countries are also members of the G-20.

Global governance challenges and the BRICS' role

- **Failures of Global Governance:** Global governance's flaws and undemocratic practices are well known. Lack of representation has contributed to institutional failures.
- **BRICS as a Solution:** BRICS could potentially address the institutional void left by current global governance shortcomings. Despite imperfections, BRICS could enhance global governance.
- **Global South's Discontent:** Interest from 40 countries in joining an expanded BRICS reflects the discontent of global South countries regarding their global standing.

Utilizing BRICS in an uncertain global order

- **BRICS in Geopolitical Uncertainty:** Amid geopolitical uncertainty, BRICS can help countries navigate complex global shifts. This is evident in the context of the Ukraine war and China's rise.
- **Relevance of BRICS:** Recent events, including the Ukraine conflict and China's emergence, have renewed BRICS' importance.
- **BRICS and Competing Interests:** While BRICS and the Shanghai Cooperation Organization (SCO) may not ensure democratic global governance, they could stimulate discussions on inclusivity.
- **Value of Imperfect Institutions:** Imperfect forums are better than a single, outdated structure; current global governance should reflect today's realities.

India's geopolitical choices and challenges

- **India's Geopolitical Position:** India's geopolitical choices are complex, with uncertainty about its role in global geopolitics.
- **Non-Western Participation Rationale:** India's participation in non-western forums like the BRICS and the SCO stems from the inequities of post-World War II institutions.

- **Balancing Multiple Affiliations:** India belongs to BRICS, SCO, and the global South due to historical, developmental, and geographical factors.
- **Balancing China's Presence:** China's dominance in BRICS and other forums poses challenges for India, as it also aspires to engage in the G-20, G-7, and Quad.
- **India's Geopolitical Dilemma:** India stands at an emerging geopolitical faultline, balancing interests and affiliations.

Competing blocs and India's strategy

- **Rise of Competing Blocs:** China and Russia aligning against the U.S. risks creating competing blocs that challenge the status quo.
- **India's Opposition to Blocs:** India historically opposes bloc politics in favor of equitable global governance and multipolarity.
- **Inevitable Involvement in Bloc Dynamics:** Despite opposition, India might be drawn into bloc dynamics due to complex geopolitical factors.

China's Global Rise and India's Choices

- **India's China Dilemma:** India must consider whether its pursuit of a multipolar world aids China's global rise.
- **Impact of Global Forums:** Strong global forums can inadvertently strengthen China's global influence, impacting India's choices.
- **Balancing Geopolitical Forces:** India faces the challenge of balancing its commitment to equitable global governance with safeguarding its national interests.

Way Forward

- **BRICS' Role:** BRICS can serve as an alternative platform to address global governance deficiencies, despite its imperfections. It could initiate discussions on more inclusive global governance.
- **Navigating Complexity:** India's geopolitical choices are complex due to its affiliations in various forums. India's participation in non-Western platforms reflects a response to historical inequities.
- **Balancing Geopolitical Shifts:** As competing blocs emerge, India must balance affiliations between a China-centric and a West-centric world order. Striking this balance is crucial to India's global positioning.
- **Managing China's Rise:** India needs to consider whether its actions inadvertently support China's ascent. While India must moderate China's influence, it should avoid alienating other global South nations.

- **Safeguarding National Interests:** India's active participation in global forums must align with promoting equitable global governance while ensuring its national interests are safeguarded.

Conclusion

- Amid global uncertainties, India's role in the BRICS summit gains prominence. Balancing between non-Western forums and Western ties, India aims for equitable global governance while managing China's ascendancy. These decisions could mold India's path and impact the evolving international landscape.

27. What are the concerns about drilling in the North Sea?

- Even as the globe continues to move closer to irreversible climate disaster, the U.K. Prime Minister recently supported proposals for more fossil fuel drilling off Britain's shore.
- The round is anticipated to issue approximately 100 licenses overall, according to the North Sea Transition Authority (NTSA), which is in charge of overseeing the oil, gas, and carbon storage industries.

History of Drilling

- Geographically speaking, the North Sea is situated between the countries of Norway, Denmark, and Germany on its east, the Netherlands, Belgium, and France on its south, and England and Scotland on its west.
- The North Sea was first explored when the 1958 Geneva Convention on the Continental Shelf became the first piece of international law to establish nations' rights over the continental shelves that are close to their shores.
- In April of that same year, the U.K. Parliament enacted the Continental Shelf Act, and the treaty entered into force shortly after.
- The Act calls for the continental shelf to be explored and exploited in accordance with the 1958 treaty.
- It defined the U.K.'s sovereignty over the oil and gas deposits beneath the seabed close to its coastlines.
- Over a hundred facilities were searching for oil and gas in the North Sea by the 1980s as more British, European, and American corporations continued their exploration.

Offshore Drilling Problematic

- Drilling for fossil fuels in seas and oceans not only makes the threat of climate change worse but also warms the waters and causes sea levels to rise.
- Offshore drilling is linked to direct threats to marine biodiversity as well as indirect dangers from acidic seas due to carbon pollution settling into oceans to coral reefs, shellfish, and the marine environment.

About Climate Commitments

- The second National Adaptation Programme, according to the Climate Change Committee (CCC), which advises the U.K. and devolved governments on emissions targets, has not done enough to get the country ready for climate change.
- According to the Climate Change Act, the government of the United Kingdom is mandated to implement National Adaptation Programmes as legislative programmes to aid in the nation's climate change preparation.
- According to the CCC report, there is "very limited evidence" of adaptation being implemented at the level required to adequately mitigate climate risk.

Conclusion

The United Kingdom's climate activity is not in line with the Paris Agreement, according to the Climate Activity Tracker. The United Kingdom's Nationally Determined Contributions (NDCs) and long-term targets do not fairly represent its contribution to the global effort to combat climate change, despite the country's overall grade of "almost sufficient". According to the Climate Action Tracker website, licensing new plans for oil and gas extraction is incompatible with the 1.5°C limit on the increase in temperature.

28. Causing floods is a terrorist offence in law proposed to replace the Indian Penal Code

The proposed Bharatiya Nyaya Sanhita Bill (BNS) introduces causing "floods" as a terrorist offence, seeking to replace the Indian Penal Code. This move raises concerns about procedural safeguards.

Bharatiya Nyaya Sanhita Bill (BNS) Proposal

- BNS Bill classifies causing "floods" as a terrorist offence, aiming to replace British-era Indian Penal Code.
- Terrorism is defined as a separate offence for the first time within general law in contrast with the Unlawful Activities (Prevention) Act, 1967, which focused on terrorist activities.

Definition and Scope of Terrorism

- Section 111 (6) (a) of the Bill defines "terrorist" as a person involved in various activities, including causing floods.
- The Bill, introduced on August 11 during the Monsoon Session of Parliament, has been referred to the Parliamentary Committee on Home Affairs for examination.

Lack of Procedural Safeguards

- The proposed law lacks procedural safeguards against false implications in terrorism and organised crime, just as is the case with UAPA and the Maharashtra Control of Organised Crime Act (MCOCA).
- UAPA is known for its draconian provisions and has led to 4,690 arrests (2018-2020) with only 3% convictions.

Missing Safeguards and Implications

- The proposed law bypasses safeguards and any police officer can register FIR labelling an individual as a terrorist.
- MCOCA and UAPA require senior police officer approval for FIRs, specific investigative ranks, and government sanctions for court cognizance. Similar safeguards are missing in the proposed law.

Real-World Case and Controversy

- The 2022 flood incident in Silchar, Assam led to criminal case registration; floods claimed over 120 lives.
- The Assam CM attributed floods to human action; accusations against one particular community led to social media uproar ("flood jihad").

Proposed Punishment and Safeguard Comparison

- Section 111 proposes minimum five-year imprisonment and the death penalty for terrorist offences.

29. Supreme Court Stays Conviction in a Defamation Case

- The Supreme Court's recent decision to stay the conviction in a criminal defamation case has significant implications for the parliamentary representation of a prominent political leader.
- The court highlighted the absence of valid reasons for awarding the maximum sentence and emphasized the need for mutual respect and caution in public speeches.

Disqualification of Lawmakers

- This is an important aspect of maintaining the integrity of the legislative bodies.
- In India, disqualification can occur under constitutional provisions and the Representation of The People Act (RPA), 1951.
- Additionally, the Tenth Schedule deals with defection-related disqualifications.

Grounds for Disqualification

- **Constitutional Provisions:** Disqualification under Articles 102(1) and 191(1) applies to members of Parliament and Legislative Assemblies. Grounds include holding an office of profit, being of unsound mind, insolvent, or lacking valid citizenship.
- **Defection:** The Tenth Schedule of the Constitution provides for disqualification on the grounds of defection.
- **RPA, 1951:** This Act mandates disqualification for conviction in criminal cases.

Disqualification under RPA, 1951

- **Section 8:** Section 8 of the RPA deals with disqualification for conviction of offences.
- **Objective:** The provision aims to prevent the criminalization of politics and bar 'tainted' lawmakers from contesting elections.
- **Disqualification Period:** Section 8(3) specifies that a person convicted of an offence and sentenced to imprisonment for at least two years will be disqualified from the date of conviction and for an additional six years after release.

Appeal and Stay of Disqualification

- **Reversal:** Disqualification can be reversed if a higher court grants a stay on the conviction or decides the appeal in favor of the convicted lawmaker.
- **Lok Prahari v Union of India:** In a 2018 decision, the Supreme Court clarified that the disqualification will not take effect if the appellate court stays the conviction.
- **Appeals Process:** For example, if a convicted lawmaker appeals, it would first go to the Surat Sessions Court and then to the Gujarat High Court.

Changes in the Law

- **Section 8(4) of RPA:** Previously, Section 8(4) stated that disqualification takes effect after three months from the date of conviction.
- **Lily Thomas v Union of India:** In the landmark 2013 ruling, the Supreme Court struck down Section 8(4) of the RPA as unconstitutional.
- **Significance:** The verdict aimed to prevent convicted politicians from continuing to hold public office while their appeals were pending, contributing to the purification of Indian politics.

Supreme Court's recent observations

- **Lack of Reasoning:** The court noted that the trial judge failed to provide any reasons for awarding the maximum sentence, considering the penal code allowed various options for punishment.
- **High Court's Omission:** The Supreme Court observed that the High Court, in its judgment, overlooked the crucial aspect of the lack of reasoning behind the severe punishment.
- **Impact on Representation:** The court highlighted that disqualification from Parliament affects not only the individual but also the electorate represented by the person in question, raising concerns about unrepresented constituencies.
- **Exercise of Caution by Public Figures:** While accepting the apology for his previous "thief" remarks during the general elections, the Court reminded him of the need for caution in public speeches due to his position in public life.

30. Tehran and New Delhi drop foreign arbitration clause in Chabahar port issue

- India and Iran have agreed to drop the clause for arbitration in foreign courts concerning the Chabahar port.

Why is International Arbitration a hurdle for Iran?

- Iran's Constitution doesn't have the provision of arbitration being referred to a foreign court. Any changes in this would require a constitutional amendment and delay the needed clarity in dispute resolution mechanism at Chabahar.
- Currently, India and Iran sign one-year contracts for developing and running the terminal at Chabahar Port.
- India has been pushing Iran to sign a longer-term agreement (usually for a period of 10 years) for more certainty in investment and development plans.

- Both sides have agreed to pursue arbitration under rules framed by the UN Commission on International Trade Law (UNCITRAL) to resolve disputes betweens the users and operators of the port.

Why is the Chabahar Port Project important?

- The Chabahar port is strategically important for India as it gives an opportunity to bypass Pakistan and trade with Central Asia.
- It is located in Iran's southeastern Sistan and Baluchestan provinces and is located around 170 km away from the Gwadar port in Pakistan, which China is developing.
- It has the potential to develop into one of the important commercial hubs in the Indian Ocean and serves as a key transit centre on the International North-South Transport Corridor (INSTC) and India to counter China's influence in the region.

Evolution of India's investment in the Chabahar Port Project

- India has been interested in developing Chabahar port since 2003.
- In 2016, India, Iran, and Afghanistan signed an agreement to develop Chabahar port as a trade and transport corridor.
- India committed $85 million for the development of Chabahar port, along with a $150 million line of credit.
- India Ports Global Limited (IPGL) operates the Shahid Beheshti terminal at Chabahar port. Since IPGL began operations in 2018, it has handled more than 6.56 million tonnes of cargo.
- India is also involved in the construction of the 700-km long Chabahar-Zahedan railway line. This will further increase the cargo capacity at the port.
- For the financial year 2022, India has allocated ₹100 crore for the development of Chabahar port.

UN Commission on International Trade Law (UNCITRAL)

- UNCITRAL is a subsidiary body of the United Nations General Assembly. It was established in 1966.
- UNCITRAL has a range of conventions, model laws, and other instruments for harmonisation of laws on international trade.
- Members of the Commission are elected for terms of six years and the terms of half the members expire every three years.
- **Differences between WTO and UNCITRAL**
  -
    - While the WTO deals with trade policy issues, UNCITRAL deals with the laws applicable to private parties in international transactions.

- o For example, WTO focuses on issues like trade liberalization, abolition of trade barriers, and unfair trade practices. UNCITRAL is not involved with "state-to-state" issues such as anti-dumping, countervailing duties, or import quotas
- o WTO is usually related to public law while UNCITRAL is associated mostly with private law.

31. Project Accelerated Mission for Better Employment and Retention (AMBER)

Recently, the Ministry of Skill Development and Entrepreneurship (MSDE), launched **Project 'AMBER'.**

Background:-

- MSDE started the project in collaboration with Generation India Foundation (GIF) and Amazon Web Services India Private Limited (AWS India).

Project 'AMBER':-

- **Launched: 2023.**
- **Ministry: Ministry of Skill Development and Entrepreneurship (MSDE).**
- It is a joint initiative of the **National Skill Development Corporation (NSDC), Generation India Foundation (GIF), and Amazon Web Services India Private Limited (AWS India)**.
- The initiative has been undertaken under the **SANKALP programme.**
- **Objective:** to train 30,000 youth, focusing on women and underprivileged groups.
- Among the **30,000 youth, 50%** will be women.
- Learners engage in the AWS (re/Start) program, gaining fundamental AWS cloud skills and practical career guidance.

Features of the project:-

- The learners take part in AWS (re/Start), a workforce development program for unemployed and underemployed individuals.
- It **covers fundamental AWS cloud skills** as well as practical career tips, including resume writing and interview preparation.
- Through real-world scenario-based exercises, labs, and coursework, learners are trained in multiple technologies, including **Linux, Python, networking, security, and relational databases.**
- The program **covers the cost for learners to take the AWS Cloud Practitioner Certification exam**.

  o **AWS Cloud Practitioner Certification exam**: an industry-recognized credential that validates their cloud skills and knowledge and connects the participants with job interview opportunities in cloud or IT with local employers.

Significance:-

- It will **bring entry-level talent into the workforce.**
- It **helps individuals to launch successful cloud careers. (Cloud Computing)**
- It helps **organizations to increase their competitive edge** with in-demand talent, and communities.
- It focuses on **women to improve gender diversification** in the tech industry and underprivileged groups.

32. New Scheme to Be An Extension Of The PMAY-U Scheme

The Prime Minister announced a "new scheme" for the urban middle class living in rented accommodations.

- It aims to provide housing for families, benefiting those in **rented homes, slums, chawls, and unauthorized colonies.**

About Pradhan Mantri Awas Yojana (Urban):

- It was launched under the **'Housing for All' mission** in 2015.
- It aims to build **affordable houses** in Urban India.
- Union Cabinet approved the continuation of PMAY-U up to 31st December 2024 with all verticals, except **CLSS**, for the completion of already sanctioned houses till **31st March 2022.**
- **Achievement:** 1,18,90,000 houses have been sanctioned by the scheme till date, and around 76,25,000 houses have been completed**.**

Components of PMAY-U:

Credit Linked Subsidy Scheme (CLSS)

- **CLSS** assists economically **weaker sections, low-income,** and **middle-income groups**.
- Beneficiaries seeking housing loans from banks or related institutions for new house **construction or acquisition** are eligible.
- Interest subsidy percentages are **6.5%, 4%,** and **3%** for loans up to **Rs 6 Lakh, 9 Lakh,** and **12 Lakh** respectively.

- The Ministry has designated the **Housing and Urban Development Corporation (HUDCO)**, **National Housing Bank (NHB)**, and **State Bank of India (SBI)** as **Central Nodal Agencies (CNAs)**.
  - These agencies provide subsidies through lending institutions and oversee the progress.

In-situ Slum Redevelopment (ISSR)

- **ISSR** is designed to offer financial support of **Rs 1 Lakh per house** to slum dwellers who meet the criteria.

Affordable Housing in Partnership (AHP)

- This initiative provides central aid of Rs 1.5 Lakh for every **Economically Weaker Section (EWS) house.**
- Affordable housing projects have the **flexibility** to include a variety of homes for different groups.
- Yet, for Central Assistance eligibility, a minimum of **35%** of the homes within the project must belong to the EWS category.

Beneficiary Led Construction/ Enhancement (BLC)

- The **Beneficiary-led Individual House Construction/ Enhancement (BLC-N/ BLC-E)** plan has the goal of providing the same amount of Rs 1.5 lakh to qualified families from the EWS category.
- This money is allocated for **individual home construction or improvement**.

Key Features of PMAY-U:
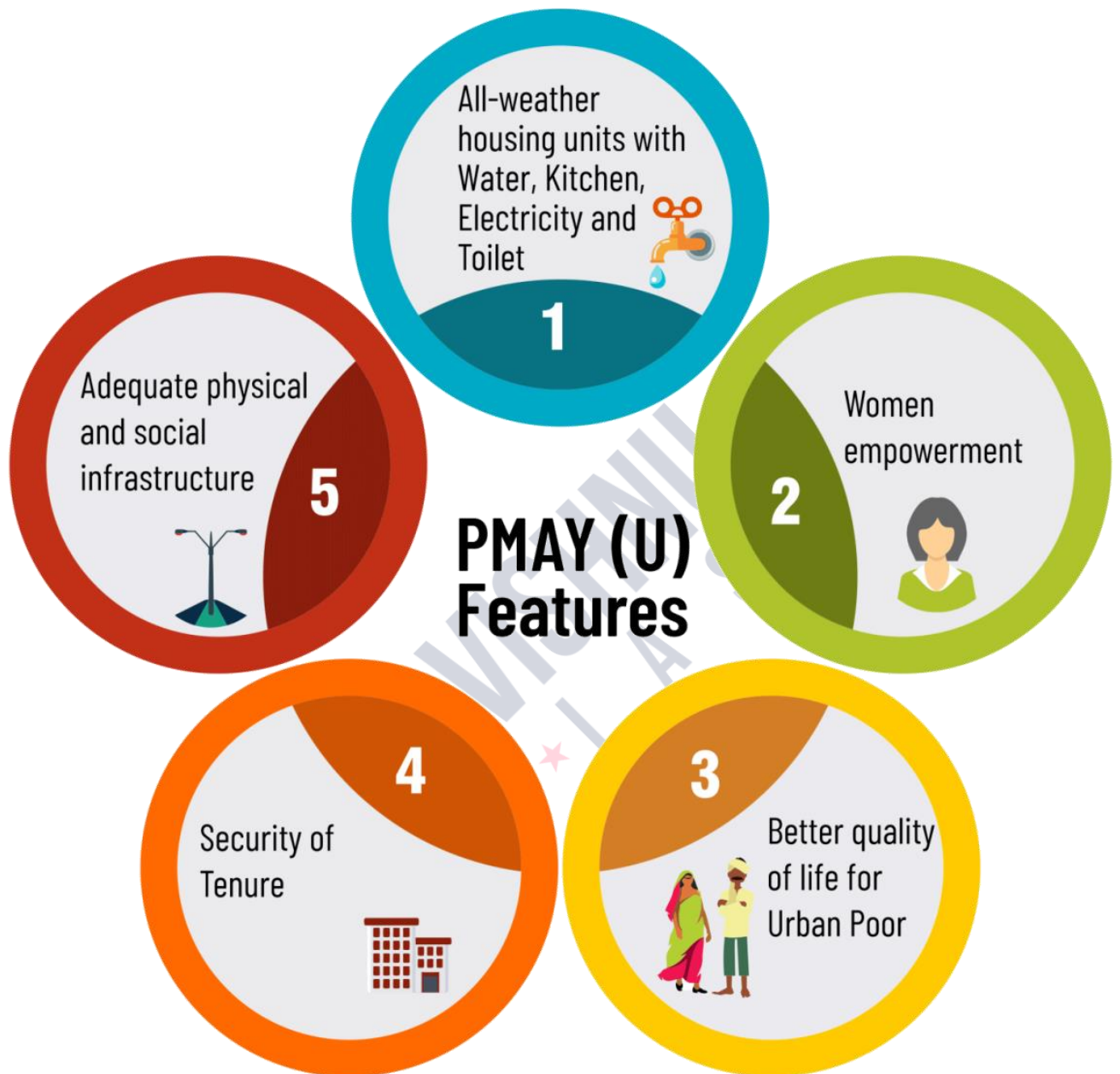
- **Mandatory use of eco-friendly materials** for building construction.
- Extending scheme coverage to **include all urban areas** in India.
- **Mandatory to register a property with both the male and female heads of the family** unless there is no female family member
- Use of **Geo-tagging** to monitor the implementation of the scheme.
- Deployment of **Public Financial Management System** (PFMS) to ensure financial accountability.

- A **Technology Sub-Mission** to facilitate the development of new construction technologies.

33. Missed childhood TB cases impede achieving 2025 goal

- There is a significant gap in the detection and notification of tuberculosis (TB) cases among children in India. TB is a leading cause of death among children and early diagnosis and treatment are essential for improving their survival rates.

What does the data say?

- According to the National Strategic Plan 2020-2025 report, children continue to be underrepresented in the national TB surveillance system, with limited capacity for case detection and lack of sensitive diagnostics being major challenges.
- In 2022, while the total notified cases were over 2.4 million, pediatric TB cases notified were only 1,35,734, which is 5.6%. In contrast, according to the 2022 pediatric TB management guidelines for India, children contribute to more than 13% of the TB case load. This shows that there is a difference of around 4-5% between the notified cases and incidence of the disease.
- This implies that over 2,00,000 children with TB were missed in 2022 alone, with the cumulative number of missed cases being much higher considering the consistent gap in detection over the years.

Challenges in diagnosing TB in children?

- Diagnosing TB in children is challenging due to difficulties in obtaining quality samples of sputum (for testing), low bacterial load in them, and the need for highly sensitive molecular tests.
- Moreover, the use of smear microscopy instead of molecular tests (more sensitive to detect cases in children) poses a significant challenge in TB diagnosis and drug-resistance screening.
- Only a small portion of children and extrapulmonary TB patients are successfully screened for drug resistance.
- There is a reduction in BCG vaccination coverage during the COVID-19 pandemic which may have contributed to the increase in TB cases among children.
- While the coverage has improved slightly in recent years, it still remains lower than pre-pandemic levels.

What are the National Strategic Plan 2017-2025 targets?

- The National Strategic Plan 2017-2025 aims to reduce TB incidence to 44 new cases or 65 total cases per lakh population by 2025.
- The estimated TB incidence for 2021 was 210 per lakh population, making it a challenging task to achieve the target.
- The program also aims to reduce TB mortality to 3 deaths per lakh population by 2025, while the estimated mortality for 2020 was 37 per lakh population.
- The plan aims to eliminate catastrophic costs for affected families, but 7-32% of drug-sensitive TB patients and 68% of drug-resistant TB patients still experience such costs. If the financial burden due to TB is above 20% of the household income, then it is considered a catastrophic cost.
- The Indian government's goals align with the World Health Organization's End TB strategy, which aims for an 80% reduction in new cases, 90% reduction in mortality, and zero catastrophic cost by 2030.

Conclusion

- Focus should shift towards improved diagnostics, enhanced case detection, and increased BCG vaccination coverage to address the significant gap in TB detection and control among children in India.

34. India Smart Cities Awards Contest 2022

Recently, the Winners of the **India Smart Cities Awards Contest 2022** were announced.

Key Highlights:-

- **President Droupadi Murmu will felicitate** the winners of the ISAC 2022 awards on the **27th of September in Indore, Madhya Pradesh.**

About India Smart Cities Awards Contest 2022:-

- The **India Smart Cities Awards Contest (ISAC)** recognizes the exemplary work championed by cities, projects, innovations, and partners in promoting 'smart' development in cities. (Smart City Mission)
- **Participants: All 100 smart cities** have participated in the ISAC.
- There have been **three editions** of the **ISAC, viz., ISAC 2018, ISAC 2019 and ISAC 2020.**
- **It was the Fourth edition of the awards.**
- **Ministry: Ministry of Housing and Urban Affairs.**

Selection Process:-

- The **award has a two-stage submission process**:-
- **First stage or 'Qualifying Stage':** It involves an overall assessment of the city's performance.
- **Second stage or 'Proposal Stage':** requires smart cities to submit their nominations **for six award categories viz.**
  - These include **Project Award, Innovation Award, City Award, State/UT Award, Leadership Award and Partners Award. (Fifth anniversary of the Smart Cities Mission)**
- The **Partners Award** is a **new addition to the Award categories.**
- It is to honour the various collaborators of the smart city ecosystem, e.g., industry partners, knowledge partners, and community-based organizations for their contribution to championing the cause of the **Smart Cities Mission.**
- **Results of the ISAC 2022 announced**: **15th August 2022.**

35. Reforms for Mobile User Protection

Minister of Communications, Railways and Electronics & IT has recently launched two reforms towards **digital transformation and enhancing customer Protection.**

About the reforms:

- **Two Reforms:** Know Your Customer (KYC) Reforms and Point of Sale (POS) registration Reform.
- **Aim:** to strengthen Government of India's commitment to fostering a **digitally inclusive society** and maintaining the **highest standards of security and customer protection.**
- Reforms are in the direction of earlier reforms introduced with the launch of **Sanchar Saathi.**

Objectives:

- To promote **safe utilization of Telecom resources** in order to facilitate protection of mobile users.
- To safeguard the **interests of citizens** of the country.
- To **fortify customer security** and bolster protection against the growing threat of telecom frauds.
- To promote the **highest level of safety and trust** within the telecommunications landscape to provide a secure and reliable communication environment for all.

About KYC Reforms:

About KYC:

- KYC is a process to **uniquely identify a customer** and enable his traceability before providing him telecom services.
- **Strengthening the existing KYC process** is a tool to protect telecom service users from potential fraud and enhance confidence in the digital ecosystem.

New guidelines for KYC:

- The **demographic details** will mandatorily be captured by **scanning QR code of printed Aadhaar** to prevent misuse of printed Aadhaar.
- In case of **disconnection of a mobile number**, it will not be allocated to any other new customer till expiry of 90 days.
- **Stringent SIM Replacement Process:** A subscriber has to undertake **complete KYC for replacement of the SIM**.
- There will be a **bar of 24 hours** on outgoing & incoming SMS facilities.
- In addition to thumb impression and iris-based authentication in Aadhaar E-KYC process, **facial-based biometric authentication** is also permitted.
- Introduction of **business connections** for issuing of mobile connections to entities (companies, organizations, trusts, society, etc).
- **Entities can take any number of mobile connections** subject to complete KYC of all of its end-users.
  - SIM will be activated only after successful KYC of end users and **physical verification** of address of the entity.

About Point-of-Sale (POS) Registration Reforms:

- This reform introduces the process for **mandatory registration of Franchisees, Agents and Distributors** (PoS) by Licensees.
- This will **eliminate the rogue PoS** who by fraudulent practices issue SIMs to anti-social/anti-national elements.
- The PoS registration process includes **indisputable verification of PoS by Licensee**.
- The process mandates **written agreement between the PoS and the Licensees**.
- If a PoS indulges in any **illegal activity**, it will be terminated and blacklisted for a period of 3 years.
- All the **existing PoS will be registered** as per this process by Licensees **within 12 months**.
- This will help in **identifying, blacklisting and eliminating rogue PoS**, from the licensees' system and provide an encouragement to the upright PoS.

About Sanchar Saathi:

- It is a **citizen-centric portal** that has empowered India's fight **against the menace of cybercrimes and financial frauds**.
- It was **launched on** 17 May 2023 (**World Telecommunication Day)** for protection of mobile users.
- This portal empowers mobile subscribers to:
    - **Find out mobile connections** registered in their name
    - Report fraud connections registered in their name, if any
    - **Report stolen/ lost mobile** handsets & **block them**.

Impacts of Sanchar Saathi:

- Out of about 18 lakh complaints about **fraudulently registered mobile connections in their name**, 9.26 lakh complaints have been resolved.
- Out of 7.5 lakhs **complaints about stolen/ lost mobile handsets**, 3 lakhs mobile handsets have been traced.
- **114 illegal Telecom setups unearthed** and action taken by **Law Enforcement Agencies** (LEAs) since 2022.
- With the help of **Sanchar Saathi portal** and **ASTR tool**, around **114 Crore active mobile connections have been analyzed**.
- The outcome is:
    - More than **66 lakh suspected mobile connections were detected.**
    - **Failing re-verification** more than 52 lakh mobile connections have been disconnected.
    - More than **67000 Points of Sale (PoS) have been blacklisted.**
    - About 17000 mobile handsets have been blocked.
    - More than **300 FIRs** have been registered against more than 1,700 PoS.
    - More than **66000 WhatsApp accounts have been blocked.**
    - About **8 lakh bank/wallet accounts used by fraudsters** have been frozen.

About ASTR:

- ASTR stands for **Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification**.
- It is an **artificial-intelligence-based facial recognition tool**.
- It was developed by the **Department of Telecommunications** (DoT).
- It can potentially bring down cyber frauds by **detecting and blocking possible fraudulent mobile connections.**

36. India and Northern Sea Route

Murmansk, the beginning point of the Northern Sea Route (NSR), is witnessing the rising trend of Indian involvement in cargo traffic.

Northern Sea Route

- It is the shortest shipping route for freight transportation between Europe and countries of the Asia-Pacific region, straddles four seas of the Arctic Ocean.
- **Coverage-** It runs around 5,600 km, the Route begins at the boundary between the Barents and the Kara seas (Kara Strait) and ends in the Bering Strait (Provideniya Bay).
- **Save distance-** Distance savings along the NSR can be as high as 50% compared to the currently used shipping lanes via Suez or Panama.
- The traditional Suez Canal route is 8000 km longer than Northern Sea passage.
- **2021 blockage-** The 2021 blockage of the Suez Canal, which forms part of the widely-used maritime route involving Europe and Asia, has led to greater attention on the NSR.
- **Navigability-** Arctic Ocean remain icebound during most of the year, the icebreaking assistance is organised to ensure safe navigation along the NSR.

Northern Sea Route

What are the advantages of Northern Sea Route?

- **Profitable**-It is a strategically important *transport artery*; it is economically profitable when comapared with Suez Canal.
- **Save fuel-** It will save fuel due to reduced distance.
- **Cost effective-** The shorter distance reduces the cost of staff labor and chartering vessels.
- The route does not charge payments for the passage unlike Suez Canal.

- **Time saving-**There are no queues (unlike, for example, the Suez Canal);
- **Safety**- There is no risk of a pirate attack.

Why Arctic region is so significant for India?

- **Impact on India-**The vulnerability of the Arctic region leads to unprecedented changes in the climate.
- This may have an impact on India in terms of economic security, water security and sustainability.

Arctic region is the region, which is above the Arctic Circle and includes the Arctic Ocean with the North Pole at its centre.

- **Svalbard Treaty-** India's engagement with the Arctic can be traced to the signing of the Svalbard Treaty in 1920.
- **Conduct studies**: Indian conducts studies regarding atmospheric, biological, marine, hydrological, glaciological events.
- **Arctic Council-** Arctic Council addresses the issues faced by governments in the region and the indigenous people of the Arctic.
- India is an *observer state* in Arctic Council including China.
- **Himadri research station**- India's first permanent Arctic research station located at Spitsbergen, Svalbard, Norway.
- It is located at the International Arctic Research base, Ny-Alesund.
- **Infrastructural base-**
    1. Multi-sensor moored observatory was inaugurated in 2014
    2. Northernmost atmospheric lab was launched in 2016
- **Successful expeditions**- India conducted around 13 successful expeditions to Arctic till 2022.

- **Arctic Policy of 2022-** It mentions that the country's approach to economic development of the region is guided by UN Sustainable Development Goals.
- **Potential for minerals**- The region constitutes the largest unexplored prospective area for hydrocarbons remaining on the earth.
- There may be significant reserves of coal, zinc, and silver.
- **Institutional support**- In 2018 India renamed National Centre for Antarctic and Ocean Research to National Centre for Polar and Ocean Research.
- It shows India's refocusing priorities in Arctic region.

What are the driving factors for India to participate in the NSR development?

- **Growth in cargo traffic-** India engagement in NSR is on the constant rise and during 2018-2022, the growth rate was around 73%.
- Last year, the volume of cargo traffic was 34.117 million tonnes.

- **India-Russia trade-** India increasingly imports crude oil and coal from Russia in recent years.
- The record supplies of energy resources for the Indian economy are possible due to such a reliable and safe transport artery as the NSR.
- **Transit route-** NSR assumes importance, given India's geographical position and the major share of its trade associated with sea transportation.
- **East meets East-** In 2019 India and Russia signed Chennai-Vladivostok Maritime Corridor (CVMC) project.
- It is signed as one linking with another organise international container transit through the NSR.
- **Reduce travel time-**The 10,500 km-long CVMC, passing through the Sea of Japan, the South China Sea and Malacca Strait, will bring down transport time to 12 days.
- This is almost a third of what is taken under the existing St. Petersburg-Mumbai route of 16,000 km.
- **Chennai Port Trust study-** Fuel and fertilisers are some of the cargo that can be imported from Russia to India through CVMC.

What lies ahead?

- **NSR development plan-** It is approved until 2035 by Russia, this sets the cargo traffic target as 80 million tonnes and 150 million tonnes for 2024 and 2030.
- The plan approval took place amid economic sanctions imposed by the West against Russia following the latter's war with Ukraine.
- **Chennai-Vladivostok Maritime Corridor project-** Workshop featuring stakeholders from the two countries, is expected to be held in the second half of October.

37. Kashi Culture Pathway: G-20 Consensus on Cultural Heritage

- The G-20 Culture Ministers' meeting held in Varanasi resulted in the unanimous endorsement of the 'Kashi Culture Pathway' document.

Kashi Culture Pathway

- Under this, G20 nations aims to address the preservation of cultural heritage, curbing illicit artifact trafficking, restitution of cultural property, and protection of living heritage, particularly that of indigenous communities.
- The document's key aspects and implications highlight the united stance of G-20 countries towards cultural preservation.

Key Features

- **Protection amid Conflict:** The 'Kashi Culture Pathway' document accentuates the collective commitment of G-20 nations to protect cultural heritage from intentional and unintentional destruction, particularly in times of conflict.
- **Combating Illicit Trade:** G-20 member nations underscored the necessity to establish a robust global coalition to counter the illicit trafficking of cultural artifacts, with special attention to bolstering law enforcement collaboration.
- **Enhanced Cooperation and Tools:** Collaboration among nations and strengthening of enforcement tools were identified as essential to heighten the effectiveness of combatting cultural property trafficking. This includes voluntary data exchange to support investigations and law enforcement.
- **Empowerment of Cultural Professionals:** The document emphasizes enhancing research, documentation, and capacity-building for cultural professionals, legal authorities, and law enforcement personnel to better counter the trafficking of cultural property.
- **Prevention and Regulation:** Preventive measures were stressed, including regulatory actions against the unlawful export of cultural artefacts, particularly within the realm of online trade.

38. Scholarship Schemes for Religious Minorities

The Centre discontinued two key educational schemes for religious minorities, and cut down on the expenditure incurred on multiple programmes of the Ministry of Minority Affairs.

Why were the scholarship programs for religious minorities introduced?

- **Rajinder Sachar Committee** - It was constituted in 2005 to look into the social, economic and educational standing of the Muslims in India.
- **Report -** It concluded that the minority was deprived and neglected in almost all dimensions of development and behind the mainstream in several social and economic sectors.
- Muslims rank somewhat above SC/ST but below Hindu OBCs, Other Minorities and Hindu General in almost all indicators considered.

Scheme	About	Status
Pre Matric Scholarship Scheme	It is awareded to minority students from class 1 to 10.	The scheme now only covers class 9 and 10.
Post-Matric Scholarship Scheme	It is given to students of class 11 to Ph.D.	The funds increased during this fiscal year.

Merit-cum-Means based Scholarship Scheme	It targets professional & technical courses at UG & PG levels.	The scholarship scheme saw a major reduction in funds in 2023-24.
Maulana Azad National Fellowship	The scheme provided financial assistance to research scholars pursuing M.Phil and Ph.D.	The scheme was scrapped in 2022.
Padho Pardesh	It was launched to provide better opportunities for higher education abroad.	The interest subsidy scheme was discontinued from 2022-23.
Begum Hazrat Mahal National Scholarship	It is awarded for meritorious girls for higher secondary education.	The scholarship had zero allocation this year.
Naya Savera	It provides free coaching to minority students for competitive examinations.	The scheme saw a drop in budget.
Nai Udaan	It supported minority students preparing for competitive exams.	No funds were allocated in the ongoing financial year.
Pradhan Mantri Jan Vikas Karyakram	The Scheme provides infrastructure in identified minority concentration areas.	Reduction of fund allocation.

- **New Ministry -** In 2006, the Ministry of Minority Affairs was carved out of Ministry of Social Justice and Empowerment.
- **Mandate -** To formulate policy & planning, coordination, evaluation & review of the regulatory framework & development programmes for the benefit of the minority communities.

What are the welfare schemes for the educational empowerment of minorities and their status?

How the schemes have impacted the beneficiaries?

- **Drastic fund decline** - Scholarships awarded to minority students steadily increased from roughly 75,000 to over 70 lakh between 2006 and 2013.
- **Data analysis** - It shows that beneficiaries of the first six central educational schemes mentioned above dropped by around 7% in three years, between 2019 and 2022.
- **Worst hit** - The Maulana Azad National Fellowship and the Begum Hazrat Mahal National Scholarship took the biggest hit during this period.
- **Drop in educational aid** -

1. **Pre-matric scholarship**, which has benefitted the maximum number of minority students.
2. **The merit-cum-means scholarship** for professional and technical courses, one of the few schemes that saw a rise in the number of beneficiaries also faced funding cuts this year.
3. **Grants-in-aid** to the Maulana Azad Education Foundation, established to promote education among educationally backward minorities also dropped.

Why does educational aid need to be strengthened?

- **Education gap -** It is due to reduced budgetary allocation and underutilisation of funds.
- **Disparity in education accessibility -** There is a significant disparity in education accessibility between Muslims and the general population.
- **Decreased enrolment rate -** Scrapping scholarships and limiting the scope of others affect the community and impact their enrolment rate.

As per Sarva Shiksha Abhiyan Data the highest proportion of out-of-school children in the country belong to Muslim communities (4.43%), followed by Hindus (2.73%), Christians (1.52%) and others (1.26%).

What lies forward?

- **Niti Aayog -** It suggested enhancing pre-matric, post-matric and merit-cum-means scholarships as well as the Maulana Azad National Fellowships and national overseas scholarships.
- It recommended a 15% annual increase from 2019-20, also increasing the number of scholarships for girls from minority communities by 10% every year.
- **Scholarships -** It should be made demand-driven, along with additional financial resources to enhance unit costs.

39. Old ties

- The Indian Prime Minister recently emphasised that despite the fact that no Indian Prime Minister has visited Greece since 1983, bilateral relations between India and Greece have not "diminished" and remain friendly.
- But since there haven't been any high-level contacts, there aren't any strong strategic relations as India has with other surrounding European nations.

Recent Developments and India-Greece Ties

- Along with plans for a skilled migration and mobility alliance, India and Greece also announced intentions to form a "Strategic Partnership" and a consultation mechanism between their National Security Advisers.
- It also intends to build collaboration in order to finish talks for the India-European Union (EU) Free Trade Agreement on Connectivity.
- Without a more comprehensive bilateral plan in place, exchanges between the two nations have been mostly based on tourism, trade, and labour migration.
- Furthermore, India and Greece, both of which were stolen by colonial forces, have had debates about the restoration of antiques.
- They may find common ground in lobbying UNESCO to help restore some of their historical property.

Concerns

- Given the difficulties between Delhi and Ankara over Kashmir and Turkey's OIC involvement, India may find some common ground in Greece's improved connections with Israel and Cyprus.
- In addition, the maintenance of marine security in accordance with international norms is a priority for India and Greece, two former historic maritime powers.

Conclusion

The connection between the earliest democracy and the most populous democracy offered "favourable omens" in India-Greece ties. This advises that both nations take advantage of the current favourable conditions to chart a route for increased collaboration without waiting another decade.

40. Scan the internal dimension on the road to 2024

- All throughout the Indian continent, several different projects are now underway.
- These must be appropriately evaluated in order to prevent any of the scenarios from spiralling out of control.
- Every event has a will of its own. The country may be in a tough situation if many of them, or even a few of them, decide to unite as elections get closer.

Recent developments and Threats

- **Challenges in the northeast**
  - Myanmar is an example in point, with the potential to envelop the whole northeast area. The predominance of many tribes with varied

affinities across the northeast necessitates immediate handling of the situation.

- o Manipur may appear to the uninitiated as a little blip on India's security horizon, yet it is a microcosm of issues that impact the whole northeast.
- o The Nagas of Nagaland are affiliated with many groups, some of which are located in Myanmar. There are many weapons and weaponry available throughout the whole Assam region, which is reason for alarm.
- o The short point is that quiet spells in the northeast frequently mask the stress undercurrents hiding just under the surface.

- **Maoism**
  - o Although the risks offered by militant contestations may range in origin and substance, they frequently have a greater degree of intensity.
  - o The CPI (Maoists) are one of the top terrorist organisations in the world, according to specialists from all around the world.
  - o These analysts disagree with the idea that the Maoist danger has been neutralised.
  - o A selective merger and demerger procedure, as well as a new leadership pattern, have shifted their goals, although they claim significantly stronger support for their ideals in urban regions.
  - o Their claim to have become 'influencers of public opinion' in metropolitan places is not as implausible as many people believe.

- **Naxalism and right-wing terror**

  -
  - o Other elements that are now in play might also have an influence on the situation on the ground. The problem of right-wing terror is a serious one.
  - o Thus, the Naxalites will continue to pose a possible danger as the nation approaches the general election next year.
  - o Geopolitics frequently affects the trajectory of right-wing terrorism, thus given the current status of the globe, India needs to remain vigilant.
  - o It has also developed regular supply routes to procure cutting-edge weaponry, notably those of the North Atlantic Treaty Organisation.
  - o Experts have frequently said that right-wing terror is on the rise. The recent decrease in bloodshed in Jammu and Kashmir should not lead to the mistaken notion that the terror danger has abated; terror networks are being built in many other places, including the South.

- **Religious Polarization**

  -
    o The return of communal violence and rioting in the nation is another regrettable trend that has recently emerged and that might get worse in a year leading up to elections. The reason for this is said to be the growing religious division.
    o All around the country, there have suddenly been a number of localised areas of racial conflict.
    o Though extremely significant violence has lately surfaced in Haryana and Maharashtra, they are not limited to one State or area.
    o The gap between the Muslim and Hindu populations is widening quickly. Communal violence is also now affecting communities that were previously thought to be largely devoid of such issues.

Way Forward

Despite the odds, India's well-earned reputation for hosting peaceful elections necessitates even greater monitoring. India must exercise caution to avoid polarisation along communal lines tarnishing the country's existing image as a bulwark of democratic principles. As a result, India's false sense of security produced by the lack of a big terror strike for a long time would have to be reassessed. The political elite, as well as security and law enforcement services, must exercise extreme caution. The attention must be on a number of separate trends occurring across India, which may erupt in the run-up to the general election next year. Although perpetual watchfulness is the price of liberty, it is also necessary to ensure that the biggest democracy in the world successfully completes yet another general election. Only this will show how really strong and valuable India is.

GS 3 : Economy, Science and Technology, Environment

1. India Semiconductor Industry

Recently, at Semicon India Summit, the Government has made a fresh bid to attract major global chip manufacturers into the country.

Status of Semiconductor Industry in India

- **Workforce** - India's semiconductor design engineers makes up 20% of the global workforce.
- About 2,000 integrated circuits and chips are designed in India every year with engineers involved in varied aspects of design and verification.
- **Semiconductor market** - As per Deloitte report, India's semiconductor market is to reach $55 billion by 2026 with more than 60% of the market being driven by 3 industries
  - Smartphones and wearables,
  - Automotive components, and
  - Computing and data storage
- Global players operating R&D in the country include Intel, Micron and Qualcomm among others.

What steps were taken by the government to promote the sector?

Gujarat will become the first state in India to have a large-scale semiconductor manufacturing facility.

- **India Semiconductor Mission-** It is an independent business division within *Digital India Corporation* having administrative and financial autonomy.
- It aims to formulate and drive India's long term strategies for developing semiconductors and display manufacturing facilities and semiconductor design ecosystem.
- ISM has been working as nodal agency for the schemes approved under Semicon India Programme.
- There are 4 subcomponent schemes announced under India Semiconductor Mission.
  - **Scheme for setting up of semiconductor fabs in India**-It provides fiscal support for setting up semiconductor wafer fabrication facilities in the country.
  - **Scheme for setting up of display fabs in India-** It provides fiscal support to eligible applicants for setting up of display fabs which is aimed at attracting large investments.
  - **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India -** Extends a fiscal support of 50% of the capital expenditure
  - **Semicon India Future Design-Design linked incentive (DLI) scheme -** Offers financial incentives, design infrastructure support across various stages of development and deployment of semiconductor design.
  - The scheme provides
    - **Product design linked incentive** - up to 50% of the eligible expenditure subject to a ceiling of ₹15 crore per application.

- **Deployment linked incentive** - of 6% to 4% of net sales turnover over 5 years subject to a ceiling of ₹30 crore per application

- **SPECS scheme**- It is the scheme for promotion of manufacturing of electronic components and semiconductors and provides financial incentive of 25%.
- **Program for Development of Semiconductors and Display Manufacturing Ecosystem**- The modified programme offers fiscal support of 50% of project cost.
- **Semicon India Conclave 2023**- India will emerge as global hub of semiconductor and chip-making industry.

What are the challenges?

- **Weak intellectual property-** India holds a small portion of IP in design though it has thriving manpower.
- **Broader industry dynamics-** Policies for semiconductor industry require long term strategy as the sector is capital intensive.
- **Low annual revenue-** The cumulative annual revenue of domestic semiconductor design companies is meagre at ₹150 crore.
- **Long gestation periods-** The returns from the investment are not immediate as setting up of design and fabrication units require long duration.
- This implies that the design firms are not able to attract potential investors and venture capitalists as software companies have.
- **Higher valuation by foreign buyers-** The Government plan to become a venture capital firm for chip design companies is ineffective as companies would pick foreign buyers.
- **Dependence on import-** In 2021, India is the 9th largest importer of semiconductor devices in the world valued 2.17 billion dollar.

What lies ahead?

- **Adopt best practices of China**- India focuses on building new logic fab, whereas China backed by massive financial support of the Government acquired loss making fabs and then set up its own.
- **Advantages of acquiring existing fabs-** Reasonable price, stabilised technology, supply chain ecosystem, established product line and market.
- **Improve value chain-** India must leverage value added activites to enable the ecosystem in a positive direction.
- **Robust mechanism-** There should be an independent investment committee and a framework for governance to mitigate the moral hazard posed by politically driven equity investments.
- **Link investments-**It must be linked to drive more innovation and employment generation in the chip sector.

- **Improve intellectual property-** Realignment towards equity from the government requires consideration of the IP, this would foster the domestic chip companies to keep the IP.
- **Government as a stakeholder**- It has the potential to create a state-of-the-art design ecosystem which will serve the national interest and also be a supplier to the rest of the world.

2. The hybrid EV imperative

The article discusses the significance of hybrid electric vehicles (EVs) in the global transition to net-zero emissions, particularly for economically developing countries facing challenges in adopting full EVs.

Introduction

- The world's transition to becoming net zero heavily relies on electric vehicles (EVs).
- Hybrid EVs offer significant opportunities for economically developing countries to begin the transition despite challenges in power generation, grid capacity, and fast charging infrastructure.

Types of EVs

- Electric Vehicle (EV): Any vehicle powered by an electric drivetrain using electricity from a portable source.
- Hybrid EV: Combines an internal combustion engine (ICE) with an electrical generator to produce electricity, with a small battery as an energy buffer.
- Full EV (Battery EV/Plug-in EV): Has no ICE and relies entirely on electricity from the grid, featuring a larger battery for storage.
- Plug-in Hybrid EV: A hybrid EV with a larger battery that can be charged from the grid, allowing electric mode operation for most daily commutes.

Fuel Economy and Emissions

- Hybrid EVs have 1.5-2x higher fuel economy than conventional ICE vehicles for city driving and 1-1.5x higher for highway driving.
- Plug-in hybrid EVs combine the benefits of both hybrid and full EVs, achieving 3-4x higher fuel economy for short commutes.
- Well-to-wheel and life cycle emissions are important metrics, including tailpipe emissions, fuel production emissions, and production/recycling emissions.
- Full EVs result in 19-34% lower emissions for sedans and 38-49% for SUVs compared to ICE vehicles.

- Hybrid EVs show 20-23% lower emissions than conventional EVs.

Challenges and Solutions

- **Fast Charging Infrastructure:**

1.
    1. Successful transition to full EVs requires fast charging infrastructure along highways to alleviate range anxiety.
    2. Fast charging enables long-distance trips with 10-20 minute stops to gain significant ranges.
    3. Indicative prices for EV fast chargers range from $500-$1,000/kW with service and maintenance at 5% per year.
2. **Grid Reliability:**
    1. Lack of access to a reliable grid in many economically developing nations may hinder EV adoption.
    2. High charging power requirements for slow and fast charging accentuate generation and transmission capacity challenges.
3. **Vehicle Cost:**
    1. Mass-market price points in economically developing countries are much lower than EVs' current prices.
    2. High battery costs contribute to the price disparity.

Advantages of Hybrid and Plug-in Hybrid EVs:

- Hybrid EVs offer a practical and cost-effective solution in the short term.
- 1.5-2x higher fuel economy reduces fuel costs, emissions, and oil imports.
- Regenerative braking and engine start-stop mechanisms enhance fuel economy in urban and hilly conditions.
- Hybrid cars' purchase price is only 5-15% higher than conventional vehicles, irrespective of the vehicle range.

Future Vision:

- In an ideal future, all electricity comes from renewable sources, powering EVs using solar and wind energy.
- Countries already progressing towards this goal should prioritise releasing this vision.
- For regions with a longer transition period, hybrid EVs serve as a viable short-term solution due to fuel economy and emission benefits.

3. Rise of Indian Entrepreneurs

Centre for Monitoring Indian Economy data 2023 suggests that Indians are increasingly in self-employment.

What is Entrepreneurship?

- **Entrepreneur-** It is an individual creating a new enterprise and bearing the risks and the rewards of the establishment. The process of establishing a business is known as entrepreneurship.
- They play a key role in the economy as they use their skills to study the market and bring new products according to the market.
- Entrepreneurs combine capital, labour and natural resources to provide services and manufacture goods.
- **Sub category**- There are 3 sub categories of Business class.
  - **Businessmen**- It includes those people who set up large businesses that leverage capital and humans to run them.
  - They manage some fixed premises such as an office, shop, workshop, factory, etc.
  - **Qualified self-employed professionals-** It includes people who run their own professional enterprises and leverage their own expertise.
  - Example-Doctors, Lawyers etc.,
  - **Self-employed-**It includes those "entrepreneurs" who run their own business enterprises but these enterprises do not leverage much financial capital, human capital or even professional skills.
  - Example- Taxi drivers, barbers, beauticians etc.,

Status of entrepreneurship in India

- According to CMIE, the total employment in India in January-April 2023 stood at 412.9 million.
- **Employment status-**In descending order
  - Farmers,
  - Wage labourers or small traders,
  - Salaried class
  - Business class or entrepreneurship- Fourth biggest category of employment.
- Business is the only category that has actually recovered to the pre-pandemic level.
- The number of people categorised under "business" grew by 8.4 million between the last four years.
- In the business class category self-employed entrepreneurs accounted for the largest share, at around 70-80 % of all the entrepreneurs in India.

- This shiftdoes not indicate an increase in real entrepreneurship but is merely a reflection of poor employment opportunities in the economy.

EMPLOYMENT

Category	2018-19	2019-20	2020-21
*Self-employed	52.1	53.5	55.6
Regular wage/salary	23.8	22.9	21.1
Casual labour	24.1	23.6	23.3

*Vegetable sellers to craftspeople and businesspersons

RISE IN UNPAID WORK

Breakup of self-employed	2018-19	2019-20	2020-21
Employers, own account workers (street vendors to businesspersons)	38.8	37.6	38.2
Helpers in household enterprise (unpaid women in the family, relatives)	13.3	15.9	17.3

Source: Periodic Labour Force Survey 2020-21

What are the benefits of entrepreneurship?

- **Money flow in the economy-** Enterprises help in the flow of money in the market by creating employment and increasing production and consumption.
- **Infrastructure development-** When an entrepreneurial ecosystem is formed in a particular area, there is an increase in the infrastructure in that area. Example- Chennai, Hyderabad etc.,
- **Employment generation**– Both direct and indirect employment is fostered by the growth of entrepreneurship.
- **Economic development**- It helps in increasing the GDP of the country through the development of new markets and creation of new wealth.
- **Social change-** It breaks with tradition and reduces reliance on outdated systems by providing unique products and services.

- **Foster innovation-** It creates market ease, new opportunities and encourages consumption, which will be a roadmap for economic development.
- **Increase standard of living-** The standard of living is directly proportional to employment.
- **Research and development**- It is due to the progress of innovation that would result in technological advancement.

Steps taken by India to Promote Entrepreneurship
• **Progressive Industrial Policies-** The central government declared industrial policies in 1948, 1956, 1980, 1986, and 1991 to promote economy growth and entrepreneurship in country.   • **Invest India-** It was launched in 2009 to promote foreign investment in the country.   • **Startup India-** It was launched in 2015 to promote innovation and entrepreneurship in India.   • **Standup India-** It was launched in 2016 to promote entrepreneurship among women and SC/ST communities.   • **Atal Innovation Mission-** It was launched in 2016 to promote an innovative culture and the development of the spirit of entrepreneurship across India.   • **E-biz portal-** It is the first online platform that was founded in 2013 that allows government-to-business (G2B) communication.   • **ASPIRE scheme**- A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE) was launched to set up incubation centres and network of technology centres to to promote startups for innovation in agro-industry.   • **Pradhan Mantri MUDRA Yojana-** It aims to develop micro units and helps in refinancing micro finance institutions.   • **Institutional support-** National Industrial Entrepreneurship Development Centre, National Entrepreneurial and Small Business Development Institute etc., provide guidance, training, and facilities to the entrepreneurs.   • **National Awards-** The government has established National Entrepreneur Awards of India to promote entrepreneurship.

What lies ahead?

- **IMF Data**- It forecasted India to be the third largest economy in 2027.
- So, India must use the opportunity and create a positive impact in entrepreneurship.
- **G20 Presidency-** India holds the presidency of G20 in 2023 with the theme of "One Earth One Family One Future".

- India led the G20's Startup engagement group which focuses on the policy recommendations on entrepreneurship and innovation.

4. Space Junk

Recently, ISRO's rocket debris was found washing the shores of beach of Jurian Bay in Western Australia.

How space junks are produced?

- Space junk refers to the dead and unwanted craft left behind in the finite space of Earth orbit for decades.
- **Sources** - Unoperational / Expired / Exploded satellites, rocket parts or spacecraft
- Anti-satellite tests that incapacitates or destroys satellites for strategic or tactical purposes (like Mission Shakti conducted by DRDO, China's 2007 ASAT test,etc.)
- Rare collision between two spacecrafts
- Mega-constellations of satellites planned by companies such as SpaceX 'sStarlink project.

SPACE JUNK BY NUMBERS

5,450 successful rocket launches since space age began

8,950 satellites placed into Earth orbit by these rockets

5,000 of these satellites are still in space

1,950 of these satellites are still functioning

8,400 tonnes is the total mass of all space objects in Earth orbit

500 BREAK-UPS explosions, collisions, anomalous events resulting in fragmentation

22,300 DEBRIS objects regularly tracked by space surveillance networks

DEBRIS OBJECTS

34,000	>10 cm
900,000	1-10 cm
128 mn	1-10 mm

Note: Approximate numbers; debris objects in orbit estimated by statistical models

What is the current issue?

- A large object was found on the shores of Western Australia has been confirmed to be the debris of an Indian Space Research Organisation (ISRO) rocket.
- ISRO has agreed with the assessment, saying the debris could be from one of its Polar Satellite Launch Vehicle (PSLV) rockets.
- The object was most likely an unburnt part of the PSLV rocket that launched a navigation satellite for the IRNSS constellation.
- Since that satellite was launched in the southward direction, it is possible that one of the parts of the rocket did not burn completely while dropping back into the atmosphere.
- This could have fell into the ocean which later have been swept towards Australian shore.
- The future course of action will be taken after considering obligations under United Nations Space Treaties.

What are the regulations available to deal with space junk?

- **Outer Space treaty, 1967-** India is a signatory to this treaty which tells that States shall be liable for the damage caused by their space objects.

- **Liability Convention, 1972-** It is the convention on International Liability for Damage Caused by Space Objects.
- It deals with
  - o Damage caused by space objects to other space assets
  - o Damage caused by falling objects on earth.

- It makes the launching country "absolutely liable" to pay compensation for any damage caused by its space object on the earth or to a flight in air.
- The country where the junk falls can stake a claim for compensation if it has been damaged by the falling object.
- International Space Law points that if a satellite becomes dysfunctional, then the satellite should deorbit and its re-entry into the earth should be carried.

With the provision of Liability Convention, Canada sought damages from the then Soviet Union, for a satellite with radioactive substance that fell into an uninhabited region in its northern territory in 1978.

Steps taken to deal with Space Junk

- **Orbital Debris Program Office-** It was set up by NASA which issued the world's first set of debris-mitigation guidelines in 1995.
- **ClearSpace-1-** It is European Space Agency mission which aims to demonstrate technologies for rendezvous, capture, and deorbit for end-of-life satellites to builds the path for space junk remediation.
- **Spinnaker3 Drag sail-** Researchers from Purdue University are test-launching a first-of-its-kind sail to low-earth orbit, in an effort to clean up space debris.
- **Astroscale-** It is a Japanese startup which launched a satellite that retrieves used satellites and other space junk
- **NETRA Project-** It was initiated by ISRO in 2020 which is an early warning system to protect the satellites from space debris and other hazards of Space.
- **REMOVE Debris-** It is a space mission that was launched to demonstrate various space debris removal technologies like net capture, harpoon capture, vision based navigation etc.,

What lies ahead?

- **Reliable data-** The collision risk in the space can be tracked effectively with the reliable data.
- **Improve technology-** There is a need to improve technology in tracking models to increase the accuracy.

- **Better coordination-** With increasing number of active satellitesnew approaches including automation and established "rights of way" may be necessary.
- **Minimize debris growth-** It can be achieved through a combination of regulation, voluntary actions, and international agreements.
- **Debris mitigation and removal-** Passive deorbiting debris and active deorbiting debris requires proper mitigation mechanism.
- **Update Outer Space Treaty 1967-** It grants countries permanent property rights to their objects in space complicating the efforts to clean up debris.
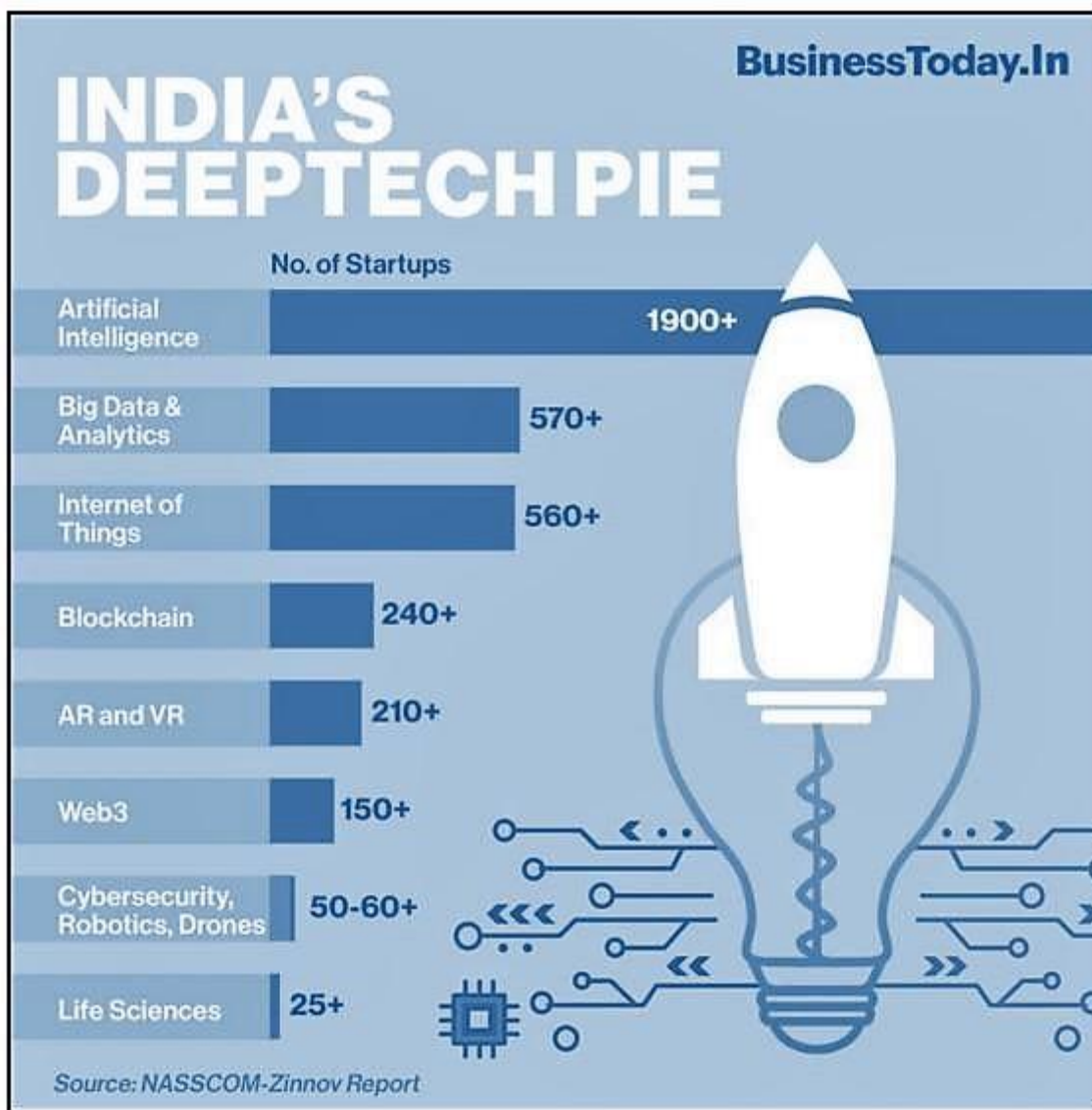
5. Deep Tech Start-ups

The office of the Principal Scientific Adviser to the Government has put out a draft National Deep Tech Start-up Policy.

Deep tech start-up

Deep-tech start-ups in India raised 2.7 billion dollars in venture funding in 2021, and accounts for over 12% of the country's overall startup ecosystem, as per NASSCOM study.

- It refers to a class of startup businesses that develop new offerings based on tangible engineering innovation or scientific discoveries and advances.
- Deep Technology refers to innovations founded on advanced scientific and technological breakthroughs like Artificial Intelligence, Quantum computing, drones etc.,
- The Great Indian Start-up Boom of the last decade, led by young entrepreneurs and catalysed by the government's Start-up India movement, created an environment of entrepreneurship in India.

INDIA'S DEEPTECH PIE
BusinessToday.In

No. of Startups

Artificial Intelligence	1900+
Big Data & Analytics	570+
Internet of Things	560+
Blockchain	240+
AR and VR	210+
Web3	150+
Cybersecurity, Robotics, Drones	50-60+
Life Sciences	25+

Source: NASSCOM-Zinnov Report

What are the advantages of deep tech start-ups?

- **Address real world problems-** It can create more effective, efficient, and sustainable solutions.
    - Example- AI and machine learning can diagnose diseases, optimize supply chains and improve energy efficiency.
- **Create new industries-** The rise of quantum computing is expected to revolutionize fields such as finance, cryptography, and logistics.
- **Foster innovation-** It helps innovation in variety of fields.
    - IIT Madras's Research Park, which has incubated over 200 deep tech companies cumulatively valued at over ₹50,000 crore including those in space and aviation.
- **Increase the patents-** National Chemical Laboratory's Venture Centre supported to file and commercialise high-quality patents.

- **Encourage investments-** Discovery through start-ups founded by themselves foster independent decisions which leverages deep historical investments in S&T in its public labs and institutions.
- **Technology risks-** Deep tech startups are the main route through which India is taking technology risks, a crucial element to build new capabilities.

What are the key provisions under draft policy?

- **Aim-** To support and nurture the unique requirements of deep tech start-ups in India.
- It serves as a comprehensive framework to address the challenges faced by deep tech startups and provide definitive policy interventions to enhance the ecosystem.

Pillars of the Draft National Deep Tech Startup Policy

Ensuring the security of india's economic future	Facilitating a seamless transition to a knowledge-driven economy
Bolstering national capability and sovereignty through atmanirbhar bharat imperative	Fostering ethical innovation

- **Enhance technology commercialisation**
  - Creating seamless partnerships between academic institutions, research labs and industry.
  - Technology commercialisation offices within academic institutes and research labs.
  - Providing a set of guidelines for commercialisation of publicly funded research.
- **Open Science Data Sharing Platform**- It is set up to encourage collaboration and knowledge sharing among the stakeholders to promote deep tech innovations.
- **Increase R&D expenditure**- It is the critical base for scientific human resource.
- **Simplify intellectual property**- It aims to establish a single window platform that enables a Unified IP Framework, customised for deep tech start-ups.

- **Ease regulatory requirements**- It suggests the creation of Export Promotion Board to ease barriers of entry for Indian deep tech start-ups into foreign markets.
- **Resource intensive policy approach**- To attract global talent, such as offering networking opportunities to international deep tech startups and experts interested in relocating and contributing to the local ecosystem.
- **Inter-Ministerial Deep Tech Committee**- It is constituted to regularly review the requirements of enabling the deep tech ecosystem to function better.

Initiatives taken to promote deep start-ups
• **Tamil Nadu Technology Hub (iTNT Hub)-** It is a public private partnership located in Chennai to serve as a central hub connecting start-ups in emerging and deeptech areas. • **TIDE 2.0 Scheme-** It promotes tech entrepreneurship in India by providing financial and technical support to incubators that support ICT startups using emerging technologies. • **Next Generation Incubation Scheme** -It is an initiative of Ministry of Electronics and Information Technology that supports innovative startups in India. • **National Supercomputing Mission** -It is a government-funded initiative launched in 2015 to make India a global leader in supercomputing. • **National Quantum Mission**- It was launched in 2023 to provide state-of-the-art quantum research facilities to scientists and researchers across the country. • **National Education Policy -** It was launched in 2020 to emphasise multidisciplinary education. • It calls for the creation of a new curriculum that will allow students to study a variety of subjects, such as science, technology, engineering, mathematics, humanities, and arts. • **NECTAR-** It is an autonomous society under Department of Science and Technology. • It aims to harness and leverage niche frontier technologies available with central scientific departments and institutions to address the socio-economic challenges of the Northeast region. • **Funds of Funds Scheme-** The Government has established it with corpus of Rs. 10,000 crore, to meet the funding needs of start-ups.

What lies ahead?

- **Finance-** The government must lay emphasis on the deep tech sectors in existing SIDBI Fund of Funds.

- Industry must increase and channel their research funds.
- **Enable mass procurement-** There is a need to mass procure indigenously developed technologies across the ministries.
- **Focus on Start-up India 2.0-** The energies of India's entrepreneurs should be directed towards building Indian industrial and public capabilities.


6. Cell Free DNA (cfDNA)

Cell free DNA is found to be promising in the field of disease discovery.

cfDNA

DNA is a molecule that carries genetic information for the development and functioning of an organism.

- Cell-free DNA (cfDNA) refers to small DNA fragments found in the bloodstream and other bodily fluids, such as spinal fluid and urine.
- These fragments are derived from various sources, including the breakdown of cells, the release of DNA from damaged or dying cells, and the shedding of DNA by normal cells.
- The presence of cfDNA in bodily fluids is an indication of various processes that include physical injury, inflammation, and cancer.

Plasma and cell-free DNA
White blood cells
Red blood cells

Cell-free DNA
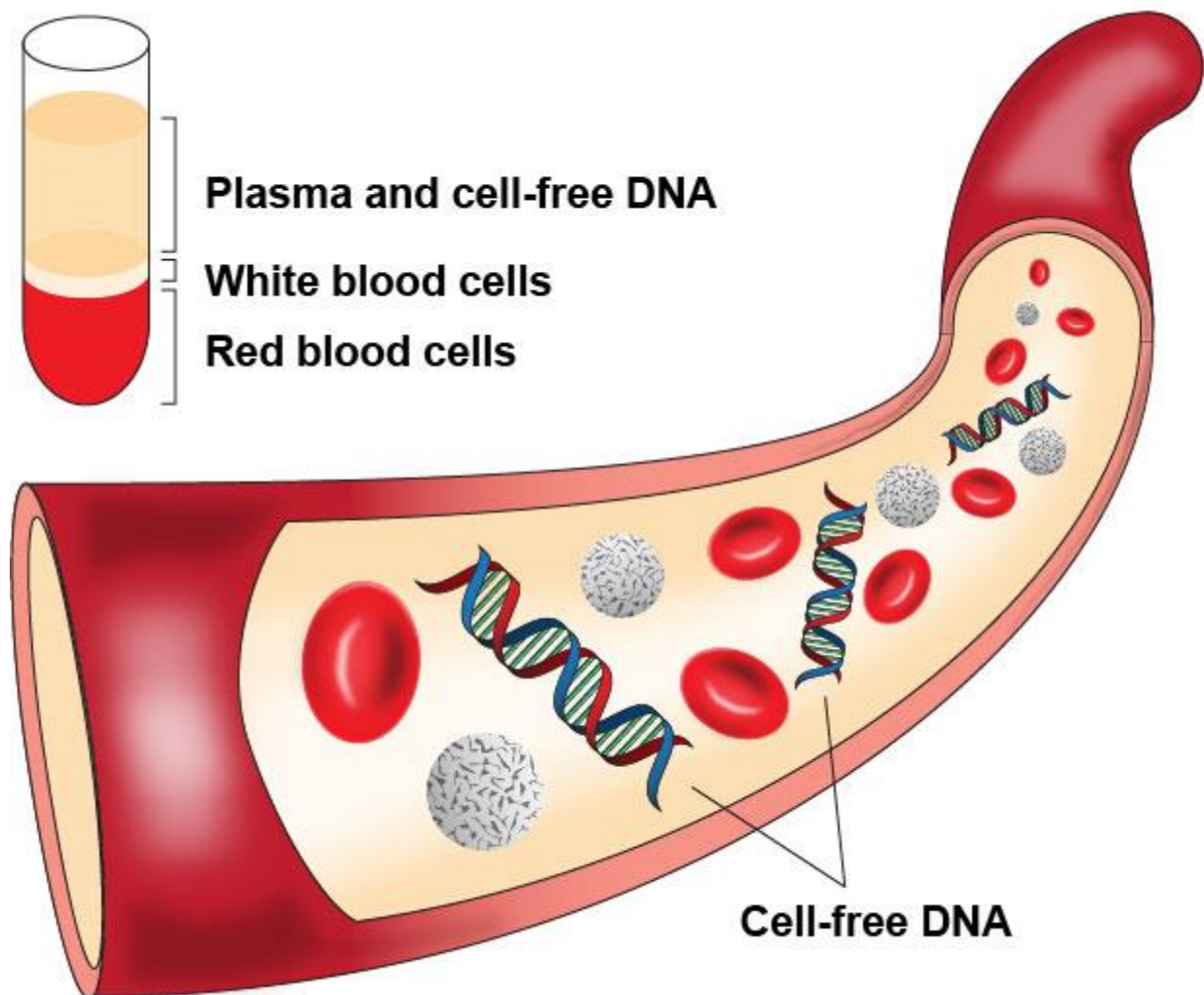
What are the applications of cfDNA?

- **Non-invasive prenatal test (NIPT) -** NIPT is a screening test that can be performed during pregnancy to assess the risk of chromosomal abnormalities in the fetus, such as
    o Down syndrome (trisomy 21)

    -
    o Edwards syndrome (trisomy 18)
    o Patau syndrome (trisomy 13)
- **Cancer treatment-** The presence of cfDNA with specific genetic abnormalities can indicate the presence of cancer.
- The analysis of cfDNA can be used to diagnose cancer, monitor the treatment effectiveness, and detect recurrence after treatment.

o **GEMINI-** Genome-wide Mutational Incidence for Non-Invasive detection of cancer adopts a whole-genome-sequencing approach to cfDNA extracted from patients.
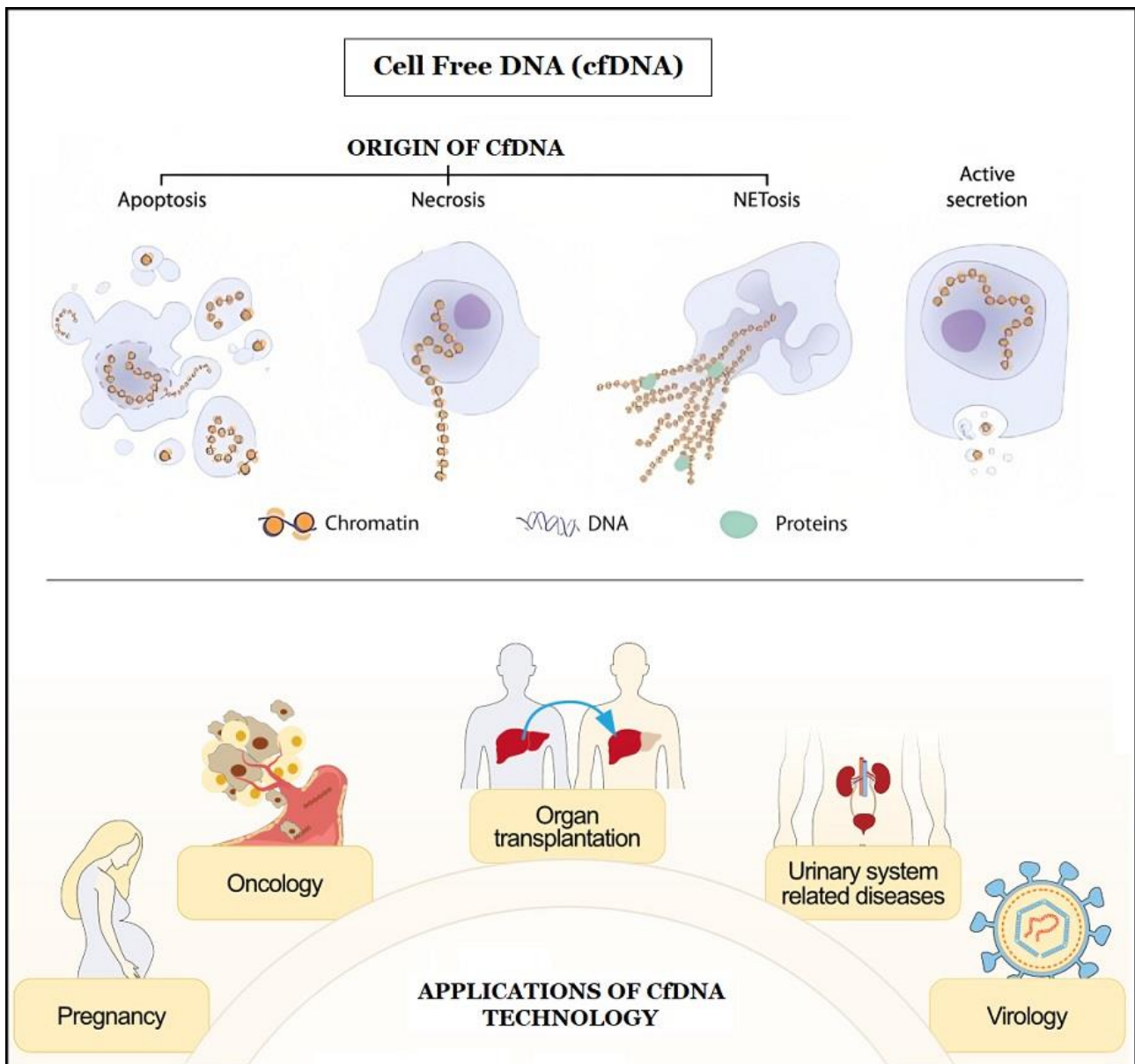
- **Biomarker-** CfDNA finds its application in the neurological disorders like Alzheimer's disease, neuronal tumours, stroke, traumatic brain injury, and even metabolic disorders like type-2 diabetes and non-alcoholic fatty liver disease.
- **Heart attack-** The analysis of cfDNA has been studied as a potential tool for the diagnosis and prognosis of acute myocardial infarction (heart attack).
- **Stroke-** The presence of cfDNA in the blood is an indicator of brain injury in stroke patients, and the analysis of cfDNA has been studied as a potential tool for the diagnosis and prognosis of stroke.

- **Autoimmune diseases**- The analysis of cfDNA is a potential tool for diagnosing and monitoring autoimmune diseases, such as rheumatoid arthritis and systemic lupus erythematosus.
- **Pregnancy complications**- The analysis of cfDNA is a potential tool for diagnosing and monitoring complications during pregnancy, such as preterm labor and preeclampsia.
- **Organ transplantation-** It helps in understanding why a body is rejecting a transplanted organ.
- DNA obtained from the donor who is donating the organ – called donor-derived cfDNA, dd-cfDNA – could provide an early yet accurate estimate of how well the organ is being taken up.

Circulating tumor DNA (ctDNA)

- ctDNA refers to a small subset of the cfDNA and consists of small DNA fragments released into the bloodstream by cancer cells.
- ctDNA can be detected in the blood of individuals with cancer and can provide information about the characteristics of the cancer.
- **Size-** ctDNA fragments are typically smaller than normal DNA fragments due to the presence of breaks and mutations in the DNA.
- **Composition-** ctDNA comprises both normal DNA and DNA with mutations or abnormalities.
- **Stability-** ctDNA is relatively stable in the bloodstream and can be detected for an extended period after it is released from the cancer cells.
- **Concentration-** The concentration of ctDNA in the bloodstream can vary depending on the stage and size of the cancer.
- **Heterogeneity**- ctDNA can be highly heterogeneous, meaning it can contain various mutations and abnormalities making it challenging to detect and analyze accurately.

7. Start-Ups' Intellectual Property (SIPP)

The Scheme for Facilitating Start-Ups Intellectual Property Protection (SIPP) is one of the government initiatives to support the start-up ecosystem.

What is intellectual property?

India ranked 40th in the 2022 edition of the World Intellectual Property Organisation's Global Innovation Index.

- Intellectual Property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.

- Copyrights, moral rights, trademarks, patents, and trade secrets are the 5 most common types of intellectual property.
- IP rights usually give the creator an exclusive right over the use of their creation for a certain period of time.

What is SIPP?

- **Launch year** – 2016
- **Ministry** - Ministry of Commerce & Industry
- **Aim -** To protect and promote Intellectual Property Rights (IPR) of Start-ups and to encourage innovation and creativity among them.
- It facilitate start-ups in filing and processing of their patent, design or trademark application through the assistance of IP Facilitators.
- **Implementation -** The office of the Controller General of Patents, Designs and Trade Marks (CGPDTM) is the implementation agency that bears the facilitation fee.

The office of (CGPDTM), generally known as the Indian Patent Office, is an agency under the Department for Promotion of Industry and Internal Trade that administers the Indian law of Patents, Designs and Trade Marks.
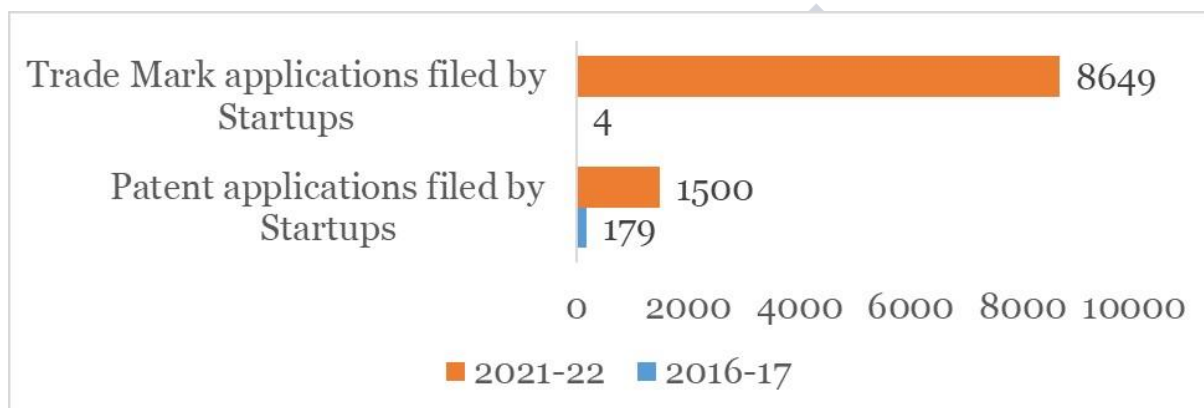
- **Time period -** Originally, the scheme was up to March 2020 but was extended further for a period of 3 years.
- The scheme is further extended for a period of 3 years with effect from 01.04.2023.

How significant is the IPR for start-ups?

India is now the hub of start-up ecosystem in the world, ranking **3rd** with 90,000 start-ups and 107 unicorn companies worth 30 billion dollars.

- **Exclusive rights -** Intellectual Property Rights (IPR) gives start-ups exclusive rights to their products, services, or processes which can help them to differentiate themselves from their competitors.
- **Rebates -** Start-ups are provided 80% fee rebate in filing patent applications and 50% fee rebate in filling trademark application under the new rules.
- **Reduction in cost** - The applicant has to bear only the official fee/statutory fee incurred for filing patent and design application. The government will bear all facilitator fees.
- **Fast-tracking of patent applications –** A "Request for Expedited Examination" mandates the Controller to issue the First Examination Report (FER) within 105 days when the expedited examination request is accepted.
- Granting of patents is reduced to less than a year from 5 to 7 years.

- **Tax exemption** - Start-ups will be exempted from income tax for 3 years subject to providing certification from Inter-Ministerial Board (IMB).
- **Relaxation in public procurement norms** - A DPIIT registered start-up may bid for government contracts with fewer eligibility requirements.
- **Self-certification** - Start-ups are allowed to self-certify their compliance under certain labour and environment laws for 5 years from the date of incorporation of the entity.
- **Easy winding up of company** - Start-ups can be wound up within 90 days as against 180 days for other companies.
- **Free assistance -** Start-ups can avail assistance with filing patent, trademark, and design applications from empanelled facilitators free of charge.
- **Investment -** IP can also help start-ups to attract investment and help them expand into new markets.

Trade Mark applications filed by Startups: 8649 (2021-22), 4 (2016-17)
Patent applications filed by Startups: 1500 (2021-22), 179 (2016-17)
Legend: ■ 2021-22 ■ 2016-17

What are the gaps in SIPP?

- **Lack of awareness -** Many start-ups are not aware of the importance of IP protection.
- **IP infringement** - Lack of IP protection makes them lose out on potential opportunities and expose them to IP infringement.
- **Cost -** The cost of filing patent, trademark, and design applications can be high and be a barrier for some start-ups that are just starting out.
- **Lack of access -** Quality IP services are less accessible in India.

How these gaps in SIPP could be addressed?

- **Awareness initiatives -** The government and industry bodies need to raise awareness about the importance of IP protection among start-ups through workshops, seminars, etc.
- **Monetary assistance -** The Government could provide financial assistance to start-ups by means of grants, loans, etc. to help them to cover the cost of IP protection.

- **Quality services -** The government could work with industry to set up IP clinics, provide training to IP professionals and create a database of IP service providers to improve access to quality IP services in India.

8. Rules Governing Space Junk

Australia's space agency has confirmed that the mysterious object that washed up on one of the country's beaches is ISRO rocket debris.

- The object is from an expended third stage of a **Polar Satellite Launch Vehicle (PSLV)** of the ISRO.

Are such incidents normal?

- **Junk from space objects** falling to the earth is not unheard of.
- Most such incidents involve **relatively small fragments** from rockets that **survive the friction** of the atmosphere.
- Most of the time, **space junk falls into oceans**, thus posing little danger to human populations.

What are the concerns?

- The threat to life and property from falling space junk is **not negligible**.
- Even when **falling into the oceans**, which is more likely since 70 per cent of the earth's surface is ocean, large objects can be a **threat to marine life, and a source of pollution**.

What happens if these objects cause damage?

- There are **international regulations governing space debris**, which include junk falling back on the earth.
- **Most space-faring countries** are **signatories to the Convention on International Liability** for **Damage Caused by Space Objects**.
- **This convention** is one of the several international agreements that **complement the Outer Space Treaty**.
  - **Outer Space Treaty** is the overarching framework **guiding the behaviour of countries in space**.
- The **Liability Convention** deals mainly with **damage caused by space objects** to **other space assets**, but it also applies to **damage caused by falling objects on Earth**.

- The Convention makes the **launching country "absolutely liable"** to **pay compensation** for any damage caused by its space object on the earth or to a flight in air.
- The **country where the junk falls** can **stake a claim for compensation** if it has been damaged by the falling object.
  - o This provision of the Convention has **resulted in compensation payment only once** so far.
  - o It was when **Canada sought damages from the then Soviet Union**, for a satellite with **a radioactive substance** that fell into an uninhabited region in its northern territory in 1978.

9. Re-Greening the Baltic Sea

A project of restoring **Seagrass meadows** has recently been started in the **Baltic Sea** to tackle climate change.

About Seagrass Meadows:

- It is an **underwater ecosystem** formed by **seagrasses**.
- They are **flowering** plants with **stems, seeds, pollen** and **long green, grass-like leaves**.
- They have **roots** and **rhizomes** which **anchors** them in **seafloor sand**.
- The meadows act as natural sinks that can store millions of tonnes of **carbon.**
  - o Seagrasses **store more than twice as much carbon** than rainforests.
- They have reduced sharply over the last century due to **worsening** water quality.
- Seagrasses are also **ecosystem engineers**, which means they **alter** the **ecosystem** around them, adjusting their surroundings in both **physical** and **chemical** ways.
- Seagrasses **prevent erosion** of the **seafloor** to the point that their presence can raise the seafloor.
- They contribute to coast protection by **trapping rock debris** transported by the sea.
- The plants also help **support fisheries** and **protect coasts** from **erosion**.

Re-Greening the Sea:

- Europe had lost about **one-third of its seagrass areas** between the **1860s** and **2016**, releasing **carbon** into the **atmosphere** and speeding up **global warming.**

- The **SeaStore Seagrass Restoration Project** in **Kiel**, enable citizens to restore the plants.
    - o It is run by the **GEOMAR Helmholtz Centre for Ocean Research** of the United Nations.
    - o The ultimate goal of this is to **scale** the **conservation programs** to **re-green** the Baltic Sea.
    - o The seagrasses that are **resilient** to **rise** in **temperature** were also studied.
- The seagrass breeds **more heat-resistant strains** as these **cannot** move to cooler areas of the ocean.

New methods for Re-greening:

- The process of planting **flowering seagrass** to **harvest seeds** and experiment with planting them are done.
    - o This is a **less laborious** process.
- It is a very **long** and **tedious process** that requires many divers to plant shoots to restore all the lost seagrass in the **Baltic Sea**.

About Baltic Sea:
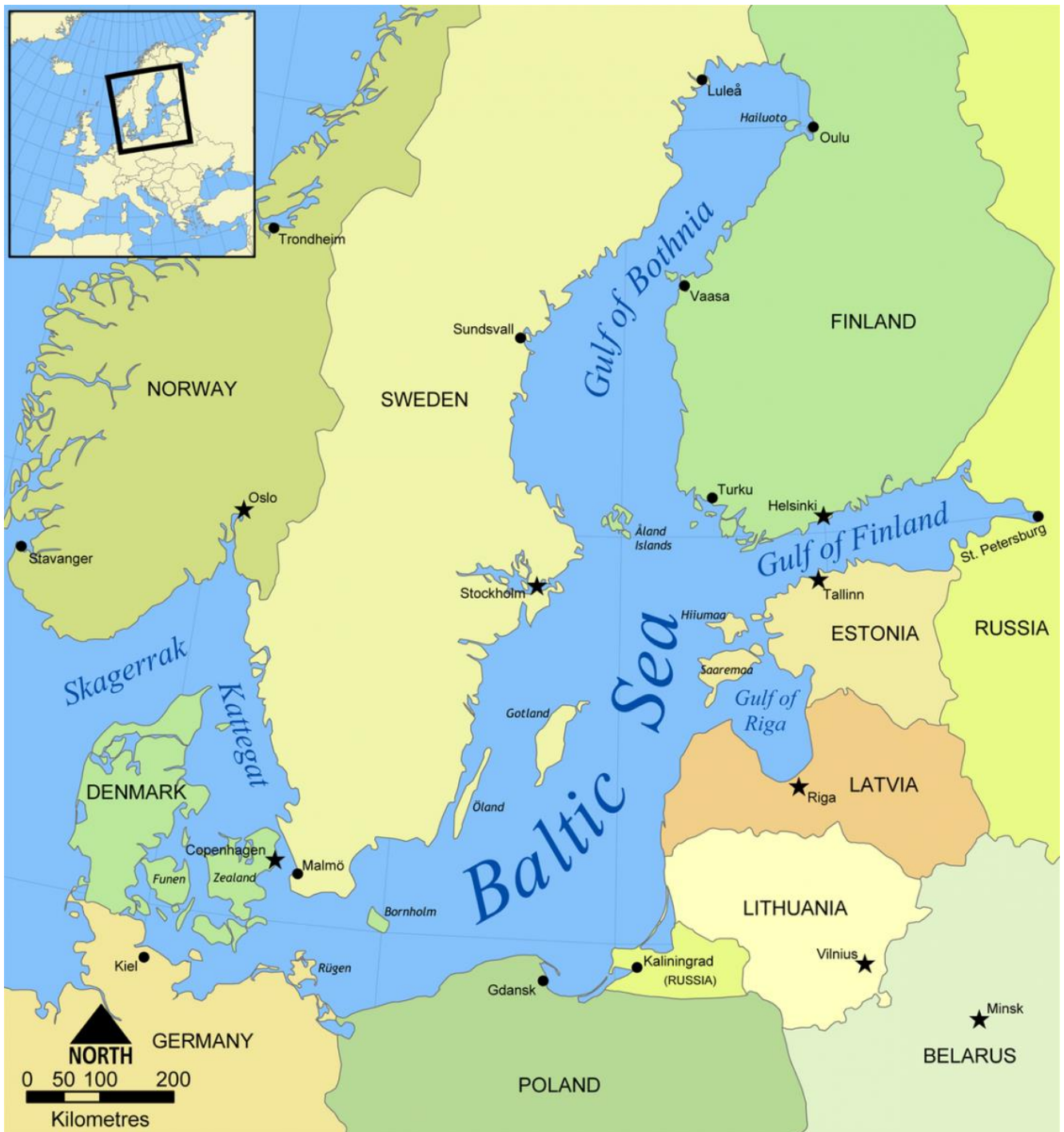
- The Baltic Sea is an **arm of the Atlantic Ocean** that is enclosed by **Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden and the North and Central European** Plain.
- The Baltic Sea is connected by **artificial waterways** to the **White Sea** via the **White Sea–Baltic Canal** and to the **German Bight** of the **North Sea** via the **Kiel Canal**.

10. Mapping India's chip design ecosystem

The Union Government has recently been reconsidering to **pick** an **equity stake** in **domestic chip design-making companies** as part of the **2nd phase of the Design-Linked Incentive (DLI) scheme**.

About Domestic Chip industry:

- India is an important destination for global semiconductor companies because of its **highly-skilled talent pool** of **semiconductor design engineers**.
  - They make **20%** of the **world's workforce** as part of global teams or working independently.
- About **2,000 integrated circuits** and **chips** are designed in India every year.
- The DLI for chip designing was **introduced** in **2021** to indigenize innovations.
- The DLI aspires to **grow** at **least 20 companies** in **India** by scaling a turnover of **more than ₹1,500 crore** in the next **five years.**

About Design linked Incentive (DLI) scheme:

- It aims to **create** a **vibrant ecosystem** for **Semiconductor Chip Design** in India for the world.
- It was announced by the Ministry of Electronics and Information technology **to offset** the **disabilities** in the **domestic industry** involved in **semiconductor design**.
- Its objective is to get involved in the global value-chain and **strengthen** the **semiconductor chip design** ecosystem in the country.
- **Nodal agency:** Centre for Development of Advanced Computing (CDAC)
- It **offers financial incentives** and **design infrastructure support** across various stages of **development** and **deployment** of semiconductor design(s) for **5 years**.
  - Such semiconductor design includes for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor-linked design(s).

- DLIs form part of the SemiconIndia futureDESIGN initiative.

Challenges in emerging as semiconductor and chip-making industry:

- The government's attempt to become a **venture capital firm** for chip design companies is **ineffective** and **inefficient.**
- **Foreign buyers give** companies **higher valuation** and also connect them to a global ecosystem of customers and investors.
- **Lack** of **venture capitalists** in the private sector focused on semiconductors in India.

- The **cumulative annual revenue** of domestic semiconductor design companies is just **₹150 crore**.
- The government requires **consideration of Intellectual Property (IP)** – the companies would ideally want to keep it to themselves.
- **Value-added activities** (with respect to chip designing) are **not** significantly executed in India.
  - Thus, it is essential that **value-added activities** are brought into the country.
- Manufacturing, design, or any policy directed toward semiconductor industry requires a long-term strategy for this **capital-intensive sector**.
- It involves **sizeable costs** in setting up **fabrication units, upscaling manufacturing** capabilities and **equipments** (such as thermal stimulators, sensors), and research.
- Setting up **design** and **fabrication units** involves **long gestation periods** thus, returns from the investment are **not immediate**.
  - It takes up to **2-3 years** before the **first** product is made.
- **Chip designing requires higher investment** than a **traditional** aggregator company.
  - As chipsets are **becoming smaller** day by day and **functional requirements** from them change, research and development become challenging.
- Supply chain disruptions, like the one that happened during the **COVID-related lockdowns** in **China**, could dampen **potential investor confidence** in the sector.

Semiconductor market in India:

- The Indian semiconductor industry in **2022** was **USD 27 Billion**, with over **90**% being **imported**.
  - This signifies **external dependence** of Indian chip consumers.
- It is expected to reach **USD 55 Billion** by **2026**, growing at **20%** Compound Annual Growth Rate (**CAGR**) during the period 2022-2026.
  - **CAGR** measures how an **investment** or **business** has grown over a **specific period** of time.
    - It takes into account the effect of **compounding**, which means the **growth**.
- **Three industries**: smartphones and wearables, automotive components, and computing and data storage are the major market-driving sectors for growth.

11. ISRO Rocket Debris on Australian Shore

- A couple of weeks ago, a large object discovered on the shores of Western Australia has been confirmed to be the debris of an ISRO rocket used for IRNSS constellation.
- The incident raises concerns about space debris and its potential impact on Earth and its inhabitants.

Frequency and Risks of Space Junk

- **Common Occurrences**: Incidents of space debris falling back to Earth are not uncommon. Most instances involve relatively small fragments that survive atmospheric friction, typically not making significant news.
- **Publicized Instances**: However, there have been a few highly publicized falls, such as a 25-tonne Chinese rocket chunk falling into the Indian Ocean in May 2021 and the disintegration of the Skylab space station in 1979, with some fragments landing in Western Australia.

How did ISRO debris land in Australia?

- **Probable Re-entry and Ocean Drift**: The debris likely remained unburnt while dropping back into the atmosphere during re-entry and eventually fell into the ocean. Ocean currents may have carried it towards the Australian shores.
- **Move for disposal**: The Australian Space Agency is working with ISRO to determine the next steps, including considering obligations under the United Nations space treaties.

Potential Hazards and Impact

- **Threat to Life and Property**: The threat to life and property from falling space junk cannot be ignored. Even objects falling into oceans can pose risks to marine life and contribute to pollution.
- **Recorded Incidents**: So far, there are no recorded incidents of falling space objects causing significant damage on Earth. Instances of debris falling over land have generally occurred in uninhabited areas.

International Regulations and Liability

- **Convention on International Liability for Damage Caused by Space Objects**: International regulations, such as this Convention, govern issues related to space debris falling back to Earth.

- **Absolute Liability**: The launching country is "absolutely liable" to pay compensation for any damage caused by its space object on Earth or to a flight in the air.

☐ **Compensation Provision**: In the current case, if the PSLV debris had caused any damage in Australia, India could have been liable to pay compensation, regardless of it falling into the ocean first.

☐ **Past Compensation**: The Convention has resulted in compensation payment only once when Canada sought damages from the Soviet Union for a satellite with a radioactive substance falling into its uninhabited northern territory in 1978. The Soviet Union paid 3 million Canadian dollars as compensation.

ISRO's Efforts to Mitigate Space Debris

- **Unique Scientific Experiment**: ISRO successfully conducted a dedicated commercial mission, placing seven Singaporean satellites into intended orbits on board a PSLV rocket.
- **Orbit-lowering Experiment**: During this mission, ISRO performed a unique experiment, lowering the fourth stage of the rocket into a 300 km high orbit after placing customer satellites at an altitude of 536 km to mitigate space debris concerns.
- **Reducing Debris Duration**: Thanks to the orbit-lowering experiment, the duration of the stage in space has been significantly reduced to "two months."
- **Objectives of the Experiment**: The experiment aims to address space debris mitigation problems and preserve valuable orbits for future satellite deployments.

Conclusion

- The incident of India's space debris washing ashore in Australia highlights the importance of managing space debris to ensure the safety of Earth and its inhabitants.
- ISRO's efforts to mitigate space debris through conscious measures demonstrate responsible space exploration practices.

12. Hope for Distressed DISCOMs

The Union Power Ministry's latest set of rules hopes to improve the financial health of DISCOMs.

DISCOMs

- DISCOMS are power distribution companies that buys products from the manufacturer and then generally resells them for a profit to a retailer or, in some cases, directly to the customer.
- The health of DISCOMs is crucial to keep the wheels of the economy running.
- They are regulated entities in India, with almost all consumer prices set by independent state electricity regulatory commissions.

Aggregate Technical & Commercial (AT & C) Losses

- It is combination of energy loss (Technical loss + Theft + inefficiency in billing) and commercial loss (Default in payment + inefficiency in collection).
- AT&C Losses = (Energy input – Energy billed) * 100 / Energy input.
- It provides a realistic picture of loss situation in the context it is measured.

ACS-ARR Gap

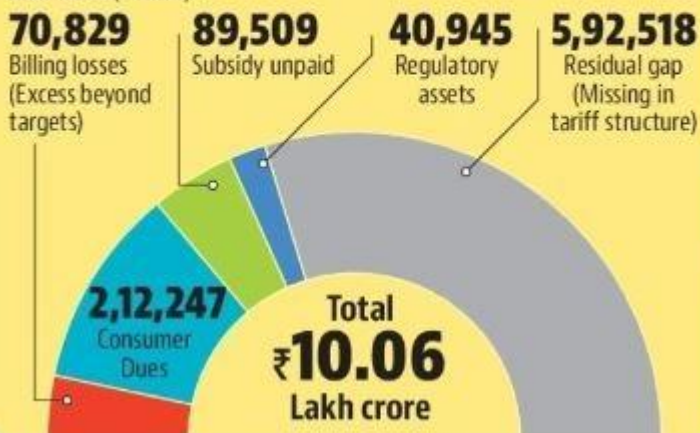- It is the gap between the average cost of supply (ACS) and the average revenue realised (ARR).

What are the issues with DISCOMs?

- **High AT & C losses-** It is arising due to issues with tariff that affects the ability of discoms to buy power to supply to the consumers.
- **Lack of compliance-** There was no legal framework for the reduction trajectory in AT & C losses.
- **Low utilisation of generation capacity-** Inadequate utilisation of generation capacity was the key contributor to power deficit. It is due to
  - Shortage of fuel, especially coal, and
  - Unviable Power Purchase Agreements.
- **Differential tariff-** Average tariff was highest for commercial and industrial (C&I) purposes and lowest for agriculture consumers.
- For example, DISCOMs in the north-eastern states and agrarian states are especially dependent on government subsidies.
- **Delay in tariff revision**- The delay in periodic tariff revision would lead to huge financial loss for DISCOMs.
- **Increase in borrowing of State owned DISCOMs-** The interest cost on the loans worsens the poor finances of state discoms. It affects their ability to buy power, thus leading to power deficits.
- **Outstanding debts**- High level of debt and payments owed to generation companies by the States leads to financial loss.
- **Impact of COVID-** The sharp downturn in demand from high-paying C&I customers during the lockdown negatively impacted the discoms' finances.

Cumulative losses of public discoms upto FY21
Cash-basis (₹ crore)

70,829 Billing losses (Excess beyond targets)

89,509 Subsidy unpaid

40,945 Regulatory assets

5,92,518 Residual gap (Missing in tariff structure)

2,12,247 Consumer Dues

Total ₹10.06 Lakh crore

Steps Taken to Boost the Power Sector

- **Accelerated Power Development Program-** It was launched in 2001 to provide central assistance for renovation of power plants and distribution network.
- **Accelerated Power Development and Reforms Program**- It was launched in 2003 to reduce AT & C losses, to increase revenue collection and improve customer satisfaction.
- **Electricity Act, 2003-** It introduced multi-year tariff, power trading and open access.
- **National Tariff Policy 2006-** It provides power procurement through tariff based bids and to ensure electricity availability to consumers at comparative rates.
- **Financial Restructuring of State Distribution Companies-** It was launched in 2012 which allows DISCOMs to issue bonds backed by State Government.
- **24*7 Power for All-** It is State specific power development plan that provides 24*7 electricity access.
- **UDAY-** Ujwal Discom Assurance Yojana was launched in 2015 that allows state to take over 75% DISCOM debt.
- **KUSUM**- It was launched in 2018 which aims for 10 GW of solar distribution grid.
- **Saubhagya-** It was launched in 2017 to provide universal electricity access.

What are the new rules?

- **Mandate-** Central Electricity Authority has been mandated to issue guidelines for establishing norms for operation and maintenance of the distribution system
- **Legal framework-** State Electricity Regulatory Commissions have to ensure compliance in reduction of AT&C loss reduction trajectory.
- In case of non-adherence, punitive action can be taken by the respective states.
- It is also provided that gains or losses accrued to distribution licensee due to deviation from approved AT&C loss reduction trajectory would be shared between the distribution licensee and consumers.
- **Subsidy payment**- The payment of subsidy should be assured at the time of tariff finalisation in order to ensure financial sustainability of DISCOMS.
- **Submit quarterly report-** Distribution licensee should submit the report to the State Government.
- **Transparency-** To ensure the recovery of full costs incurred by the distribution licensee in distributing electricity, all prudent costs of power procurement must be done in a transparent manner.
- **Reasonable Return on Equity (RoE)-** The Rule provides that the RoE by the State Commission would be aligned with the RoE specified by the Centre Electricity Regulatory Commission in its Tariff Regulations.

What lies ahead?

- There is a need to improve the methodology of Annual Revenue Requirement filings, bridge the gap between costs and revenues.
- The Centre should ensure more effective cash flow management, and reduce reliance on cost true-up petitions.
- There is a need of constant dialogue between all stakeholders to ensure the measures are implemented in their true spirit.

13. Centre to probe Havana Syndrome Cases in India

- Havana Syndrome, a mysterious set of mental health symptoms experienced by US intelligence and embassy officials in India, has caught the attention of authorities.

Havana Syndrome

- **Cuban Incident:** The term "Havana Syndrome" originated in Cuba in late 2016 when US officials at the newly opened US embassy in Havana reported

symptoms like pressure in the brain, headaches, and disorientation. The cause of these symptoms initially sparked suspicions of a "sonic attack" orchestrated by Cuban intelligence.

- **Subsequent Reports:** Following the Cuban incident, similar symptoms were reported by American officials stationed in China, Russia, Poland, Georgia, Taiwan, Colombia, Kyrgyzstan, Uzbekistan, Austria, and even in Washington DC, including near the White House.

Havana Syndrome in India

- **Sole Reported Case:** As of July 2023, the 2021 incident involving a US intelligence officer in India is the only reported case of Havana Syndrome in the country.
- **Indian Security Establishment:** Indian security officials have claimed that they are not aware of any agency possessing such microwave-based counter-espionage technology.
- **Geopolitical Considerations:** Given India's friendly relations with the US, officials find it unlikely that an Indian agency or foreign power would target US officials in this manner.

Possible Causes of Havana Syndrome

- **Microwave Exposure:** Scientific research and medical examinations of the victims have suggested that high-powered microwaves may have damaged or interfered with the nervous system, leading to the reported symptoms.
- **Microwave Weapon:** The syndrome was speculated to be caused by beams of high-powered microwaves sent through a specialized gadget known as a "microwave weapon."
- **Counter-Intelligence Tactic:** Both Russia and the US have experimented with using microwaves as a counter-intelligence tactic since the Cold War.

Debunking the Havana Syndrome Theory

- **Lack of Conclusive Evidence:** Despite years of data collection and experiments, the US has not found conclusive evidence to support the existence of a "microwave weapon."
- **Psychological Illness Amplified:** Some medical experts argue that the syndrome could be a psychological illness amplified by fear of being targeted.
- **Impact on Relations:** A report from several US security agencies in 2023 suggested that foreign adversaries were unlikely to be behind the "anomalous health incidents," which may have impacted US-Cuba relations.

Conclusion

- The enigmatic Havana Syndrome continues to baffle experts and policymakers worldwide, with no definitive evidence of its origins and causes.
- As India examines the issue in response to the recent petition, the global mystery surrounding Havana Syndrome remains an ongoing concern for intelligence communities and governments alike.

14. Room Temperature Superconductivity

Recently, two South Korean researchers claimed that a lead-based compound (LK-99) had shown superconducting properties at room temperature under normal pressure conditions.

Superconductor

The phenomenon of superconductivity was first discovered in 1911 by Heike Kamerlingh Onnes, which earned him the 1913 Nobel Prize in physics.

- A superconductor is a material that can conduct electricity or transport electrons from one atom to another with no resistance.
- Superconductivity refers to a state in which a material offers zero, or near-zero, resistance to electric current.
- **Superconductive**- No heat, sound or any other form of energy would be released from the material when it has reached critical temperature (Tc), or the temperature at which the material becomes superconductive.
- **Critical temperature**- It is the temperature at which the electrical resistivity of metal drops to zero in superconductor.
- Example- Aluminium, niobium, magnesium diboride, etc.,

What are the properties of superconductors?

- **Meissner Effect (Expulsion of Magnetic Field)** - A Superconductor, when it is cooled below the critical temperature Tc), expel the magnetic field and doesn't allow the magnetic field to penetrate inside it. This phenomenon in superconductors is called Meissner effect.
- In a solid material, this is called **diamagnetism**, and a perfect conductor would be a perfect diamagnet.
- **Infinite Conductivity/ Zero Electric Resistance-** In the superconducting condition, the superconducting material illustrates the zero electric resistance.
- When the material is cooled under its transition temperature, then its resistance will be reduced to zero suddenly.

- o Example-Mercury shows zero resistance under 4k.
- **Critical Temperature/Transition Temperature** - Critical temperature of a superconducting material is the temperature at which the materials changes from normal conducting state to superconducting state.
- This transition from normal conducting state (phase) to superconducting state (phase) is sudden / sharp and complete.
- **Josephson Current-** If the two superconductors are divided with the help of thin-film in insulating material, then it forms a junction of low resistance to found the electrons with copper pair.
- It can tunnel from one surface of the junction to the other surface. The current, due to flow of such cooper pairs, is called Josephson Current.
- **Critical Current**- When a current is passed through a conductor under superconducting state, a magnetic field is developed.
- If the current increase beyond certain value the magnetic field increased up to critical value at which conductor returns to its normal state. This value of current is called critical current.

What are the applications of superconductor?

- **Medical** - MRI (Magnetic Resonance Imaging), Magneto-encephalography (MEG) and Magnetic Source Imaging (MSI), Magneto-cardiography (MCG) etc.
- **Electric field** - Generators, motors, transformers, relays, magnetic energy storages (SMES), superconducting magnets, HTS Induction Heater, Fusion etc.
- **Electronics** - SQUIDS (superconducting quantum interference device), High Speed computing, Quantum computing, Sensors, filters, circuitry, radar etc.
- **Transportation** - Magnetically levitated trains, Marine Propulsion (magneto-hydrodynamic), Marine Propulsion (motor) etc.
- **Physics** - Particle Accelerators, Magnets, Plasma / fusion research etc.

What are the limitations of superconductor?

- **Operating at room temperatures -** Superconducting materials are active only when they are kept at low temperatures. Every superconducting material has a temperature below which it becomes active.
- **Use of cryogenics**- Keeping them below the transition temperature involves a lot of expensive cryogenic technology.
- Even the most sophisticated ones like copper oxide-based ceramic materials work only below −140°C.
- Hence, superconductors still do not show up in most everyday electronics.

Why room temperature matters?

- **Room-temperature superconductors-** A material that can display superconductivity at room temperature which is usually considered to be between 20 and 25 degree Celsius.
- It is the one which conducts electricity with zero resistance without the need of special cooling mechanism.
- **Zero resistance-** A superconducting power grid would not lose energy through resistance, so it would save the energy lost to resistance in the electricity grid.
- **Affordable MRI scans-** It would make magnetic resonance imaging (MRI) much more affordable because it would no longer require liquid helium to cool the scanner's huge detecting tube.
- **Improve efficiency-**It would enable ultra-fast and energy-efficient computer chips and long-lasting batteries and lamps etc.,
- **Cost effective-**
  - o Electrical power grids would be at least 20% more efficient,
  - o Maglev trains could run further at lower cost and
  - o Particle accelerators and nuclear fusion devices could operate much more cost-effectively.

15. Spike Non-Line of Sight (NLOS)

The Indian Air Force has received Israel's **Spike Non-Line of Sight (NLOS)** anti-tank guided missiles.

- The Spike NLOS will be integrated with the Russian-origin fleet of Mi-17V5 helicopters.

Spike Non-Line of Sight (NLOS):-

- **Developed by: Rafael Advanced Defense Systems Ltd**, Israel.

Characteristic features of Spike NLOS:-

- Spike NLOS is a **multi-purpose, electro-optical/infrared missile system**.
- It is a **fire-and-forget anti-tank** and **anti-personnel missile.**
- **Range: up to 32 kilometers**
- It can be integrated with the **ground, air, or maritime platforms.**
- It has the **capability to strike distant or geographically concealed targets without line-of-sight.**
- **In missile guidance, line of sight (LOS) is the line directly between the launcher/tacker and the target.**

- The weapon's **seeker and wireless datalink** provide operators with **real-time video imagery** and man-in-the-loop control throughout the missile's flight.
  - This provides operators with the **opportunity to alter or abort the mission** while en route to the target.
- The made-in-Israel Spike missile is **capable of destroying enemy targets hidden behind mountains from long ranges**.

16. Seeds for growth: How technology can boost Indian agriculture

- Agriculture and allied sectors are central to the Indian economy. Keeping this and a sustainable future in mind, the Indian government, quite rightly, is promoting technology-enabled sustainable farming, including natural, regenerative, and organic systems, during its G20 presidency.

- Despite achieving food security through the production of 330 MT of food grains, challenges persist in meeting the demand for coarse cereals, pulses, oil seeds, and vegetables. These shortcomings contribute to a large undernourished population, including a substantial child wasting rate of 19.3%.

The Rise of the Indian Seed Industry

- **Strong Foundation (1960s):** The National Seeds Corporation was established, setting the groundwork for the industry's growth.
- **Policy Impetus (Late 1980s):** Proactive policies and regulatory support boosted the industry's development.
- **Legislative Landmark (2001):** The Protection of Plant Varieties and Farmers Rights Act was enacted, bolstering intellectual property rights and innovation.
- **Technological Transition (2002):** The introduction of BT cotton hybrids marked a shift toward technology-driven approaches for better productivity and sustainability.
- **Current Market Size:** The Indian seed market is estimated at $4.0 to $6.0 billion, with untapped potential for global prominence.
- **Millet Leadership:** India's global leadership in millet production positions it to capture the international seed market.
- **Public-Private Collaboration:** Collaboration between ICAR research institutions and private companies enhances the development of hybrid varieties.

Major determinants of profitability in agriculture

- **Seed Quality and Varieties:** High-quality seeds and improved crop varieties significantly impact profitability. Improved seeds can contribute to a yield advantage of up to 15-20% beyond the genetic potential under different cultivation conditions.
- **Input Costs:** The costs of inputs like seeds, fertilizers, pesticides, and irrigation influence profitability. The cost of seed typically constitutes around 3 to 6% of the total cost of production, but it can provide up to a 15-20% yield advantage.
- **Land and Soil Management:** Effective land preparation, soil health management, and crop rotation practices are critical for sustained profitability. Sustainable land practices help maintain productivity over the long term.
- **Water Management:** Proper irrigation methods and access to reliable water sources impact profitability. Effective water management can reduce waste and increase yields.
- **Labor Efficiency:** Efficient labor utilization, including timely planting, weeding, and harvesting, optimizes production processes and reduces labor costs.
- **Technology Adoption:** Modern agricultural technologies like precision farming and mechanization enhance efficiency and reduce resource waste. Applied seed technologies can ensure good performance even under unfavorable conditions.
- **Market Access and Pricing:** Access to markets and fair prices for agricultural products directly affect profitability. Public-private partnerships have improved Variety Replacement Rates (VRR) and Seed Replacement Rates (SRR) in field crops and vegetables.

Challenges Ahead for the Indian Seed Industry

- **Climate Variability:** Unpredictable weather patterns and shifting climate conditions challenge consistent seed production, impacting crop yields and resilience.
- **Resource Scarcity:** Diminishing natural resources like water and arable land strain the industry's capacity to meet the escalating demand for quality seeds.
- **Regulatory Framework:** Navigating evolving and intricate regulations can hinder the timely release of new seed varieties, obstructing innovation.
- **Market Access:** Equitable access to quality seeds, particularly in remote or economically disadvantaged regions, remains a significant challenge.
- **Global Competition:** The fiercely competitive international seed market demands continuous improvement in quality and variety offerings.
- **Intellectual Property Protection:** Safeguarding intellectual property rights while encouraging open innovation poses a delicate balancing act.

- **Consumer Preferences:** Adapting seed varieties to evolving consumer preferences concerning nutrition, taste, and environmental impact is a dynamic challenge.

Emerging Seed Technologies

- **Priming and Enhancement Protocols:** These protocols prepare seeds to excel under various growing conditions. Particularly valuable in regions experiencing stressors, they boost seed performance independently or in conjunction with the seed's genetic attributes.
- **Film Coating and Pelleting:** Film coating involves a protective layer applied to seeds, aiding precise planting and acting as a vehicle for pesticides, nutrients, and growth promoters. Pelleting shares similar benefits, enhancing seed protection and handling.
- **Seed Treatments:** Seed treatments encompass the application of biological or chemical pesticides to seeds, with contact or systemic action against pests and diseases during germination and early growth stages.
- **Bio-stimulants and Nutrients:** Integration of bio-stimulants and nutrients into seeds fosters improved germination rates and rapid seedling establishment, contributing to overall plant vitality and productivity.
- **AI-Responsive Sensors/Substances:** Seeds infused with AI-responsive sensors or substances can adjust plant responses to external stimuli, bolstering adaptability and performance across varying conditions.
- **Clean and Green Planting Materials:** This technology revolves around generating environmentally friendly and high-performing planting materials for horticultural crops, aligning with sustainable cultivation practices.
- **Genetic Advancements in Variety Development:** Genetic enhancements play a pivotal role in creating seed varieties with amplified traits such as disease resistance, augmented yield, and enhanced adaptability to shifting environments.
- **Metabolic Cues and Molecules:** Seed enrichment with molecules or metabolites that act as cues in biological pathways can augment metabolic processes and overall plant well-being.

Way Forward: Embracing Seed Technology for Sustainable Growth

- **Research and Innovation:** Invest in innovative research for climate-resilient, high-yielding seed varieties.
- **Quality Assurance:** Guarantee reliable access to quality-assured seeds to bolster the seed market's stature.
- **Tech Transfer:** Facilitate technology dissemination to fields via farmer training and extension services

- **Empower Smallholders:** Ensure affordable, quality seeds and provide capacity-building programs

Conclusion

- As India forges ahead with sustainable agriculture, embracing seed technologies emerges as a linchpin for progress. With robust regulatory mechanisms, India's journey towards a Clean Green Mission can set the stage for a greener, more resilient agricultural future.

17. Assam Rifles: Role, Controversies, and Historical Significance

- Recent events in Manipur have brought the Assam Rifles (AR) into the spotlight, raising questions about their role, control, and functioning.
- As India's oldest paramilitary force with a rich history, the Assam Rifles' unique structure and dual control have sparked debates over its jurisdiction and the ministries under which it operates.

Assam Rifles: A Unique Role

- **Central Armed Police Force:** AR is one of six central armed police forces (CAPFs) under the Ministry of Home Affairs (MHA). It safeguards Northeastern regions, the Indo-Myanmar border, and assists the Indian Army in maintaining law and order.
- **Operational Duality:** Uniquely, AR operates under dual control: administrative control under MHA and operational control under the Indian Army. This sets it apart from other CAPFs.
- **Composition and Leadership:** With over 63,000 personnel across 46 battalions, AR follows a regimented structure similar to the Indian Army. Its senior ranks are manned by Army officers, and the force is commanded by an Indian Army Lieutenant General.

Historical Significance and Contributions:

- **Ancient Roots:** Established in 1835, AR is India's oldest paramilitary force. It originated as Cachar Levy and evolved into Assam Rifles, earning accolades for its service.
- **World Wars and Beyond:** AR participated in World Wars and the Sino-Indian war of 1962. Its efforts in both global conflicts and anti-insurgency campaigns underline its diverse roles.

- **Versatility and Valor:** AR's combat role in World War II, counter-Japanese operations, and contribution to India's peacekeeping missions in Sri Lanka speak to its versatility and bravery.

Controversial Encounter in Manipur

- **Accusations and Escapes:** Manipur Police filed an FIR against the AR, alleging hindrance in their duty. The AR is accused of allowing suspected Kuki militants to evade capture. A video showing the tense exchange highlights concerns of collusion.
- **Voices of Discontent:** Demands to remove AR from Manipur have arisen, with the Meira Paibis demanding their exit and the state's BJP writing to the Prime Minister, alleging bias. These events underscore the complexity of AR's presence in the region.

Tensions and Accusations

- **Recent Incident:** A clash occurred when Assam Rifles vehicles hindered state police personnel from Meitei-dominated Bishnupur district from entering a Kuki-Zomi territory. Allegations arose that the Assam Rifles' actions enabled suspected Kuki militants, accused of killing three Meitei men, to escape.
- **Perceptions of Bias:** Some members of the Meitei community perceive the Assam Rifles as favoring the Kuki-Zomi community. These perceptions, along with allegations of inaction during conflicts, have further strained relations.
- **Protests and Demands:** Meira Paibis, women activists from the Meitei community, staged protests demanding the removal of Assam Rifles from Manipur. They claim that Indian security forces are being used against the Meiteis.
- **Suspicion over Collusion:** Meitei activists question how suspected militants managed to cross the buffer zone and commit the killings. They criticize the perceived inaction of Assam Rifles personnel during attacks by the Kuki-Zomi.
- **Longstanding Grievances:** Beyond the current conflict, Meiteis raise concerns about illegal immigration from Myanmar. They point to the Assam Rifles' historical responsibility for the Indo-Myanmar border and alleged inaction.

Historical Strain with AFSPA

- **Historical Tensions:** Assam Rifles has faced strained relations with Manipur's residents, particularly during counter-insurgency operations under the Armed Forces Special Powers Act (AFSPA).

- **Symbolic Resistance:** The 2004 incident where 12 Meitei women protested naked in front of the Assam Rifles Headquarters reflected the deep-rooted grievances and tensions present in the region.

Debate over Control

- **Tug of War:** Both the MHA and Ministry of Defence (MoD) desire full control over AR. MHA argues for comprehensive border-guarding coordination, while the Army believes in maintaining the current system, which has worked well.
- **Past Proposals:** In 2013 and 2019, discussions were held to merge AR with BSF and ITBP, respectively. The Army's desire for control has led to ongoing deliberations.

Conclusion

- The Assam Rifles embody a legacy of service, transcending decades and challenges.
- As the debate over control continues, the AR's role as protectors of borders and preservers of history remains unwavering, a testament to their resilience and valor.
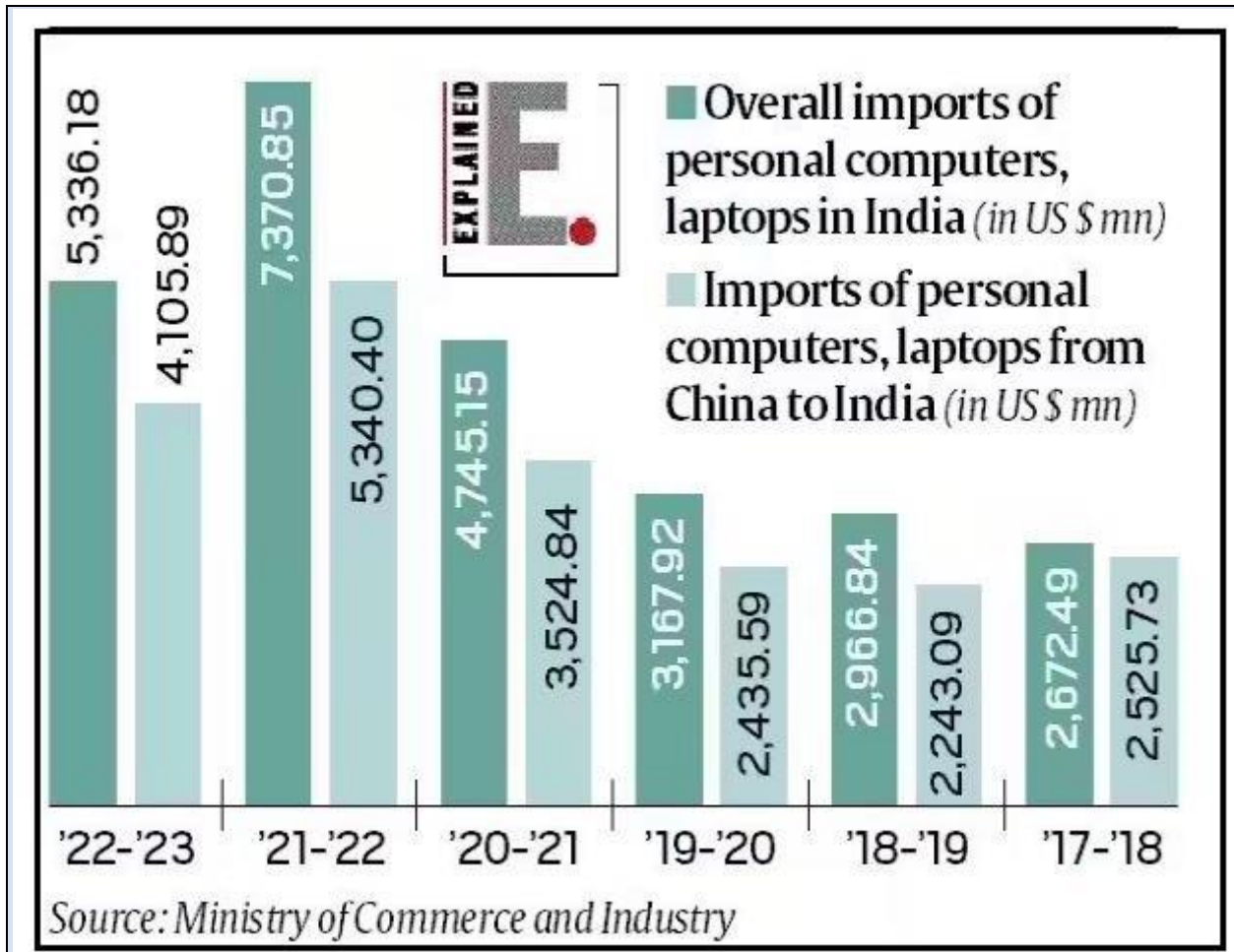
18. Import License for Laptops

(G.S III – Economy)

The Commerce and Industry Ministry has notified restrictions on imports of laptops, personal computers (PCs), tablets and servers, making it compulsory for importers to secure a licence.

Status of India's import in laptop
- In 2022-23, imports of personal computers, laptops, etc. stood at 5.3 billion dollars.
- India imported $10 billion of computing products last fiscal year.
- China accounts for an overwhelming share of these imports.
- As per a report from think tank Global Trade Research Initiative (GTRI), India's imports from China are predominantly focused on 3 key product categories – electronics, machinery, and organic chemicals

Overall imports of personal computers, laptops in India (in US $ mn)

Imports of personal computers, laptops from China to India (in US $ mn)

	'22-'23	'21-'22	'20-'21	'19-'20	'18-'19	'17-'18
Overall imports	5,336.18	7,370.85	4,745.15	3,167.92	2,966.84	2,672.49
Imports from China	4,105.89	5,340.40	3,524.84	2,435.59	2,243.09	2,525.73

Source: Ministry of Commerce and Industry

What is the procedure for obtaining import license?

- **Authority** - All notifications on restrictions, quotas and conditions on the import of goods into India are managed by the Directorate General of Foreign Trade (DGFT).
- The DGFT comes under the Ministry of Commerce and Industry.
- It is responsible for administering laws regarding foreign trade, including import regulations.
- **Validity of license -** Import Licenses are valid for
    - 24 months for capital goods
    - 18 months for raw materials components, consumables and spares
- The license term is renewable.
- **Types of licenses** - Export-Import Policy (Exim Policy) outlines guidelines and instructions governing the import and export of products.
    - **Open general license (OGL)** - Allows importers to bring in certain goods without the need for individual licences.
    - **Restricted or specific license** - Issued for goods that must be monitored due to trade agreements, international obligations, or to protect domestic industries

- Computers and laptops will likely fall into this category.
- **Eligibility for license -** An importer-exporter code (IEC), a unique 10-digit code issued by the DGFT is mandatory for the license.
- However, exemptions extends to
  o Individuals importing or exporting goods for personal use unrelated to trade, manufacturing, or agriculture.
  o Ministries, departments of central government and agencies, and non-commercial PSUs, among others.

Computers and laptops would fall under capital goods

What is the Government move about?

- India has imposed restrictions on the import of personal computers, laptops, tablets, all-in-one PCs, 'ultra-small form factor' computers, and servers falling under HSN code 8741.
- These imports will be subject to a valid license for restricted imports.
- **Aim -** To promote domestic manufacturing of these products and reduce reliance on imports from China.

Exemptions

- **Baggage rules -** This restriction will not apply to imports under baggage rules.
- **Individual purchase-** Individuals can import one laptop, tablet, all-in-one PC, or ultra-small form factor computer, even purchased from e-commerce portals.
- Duties will still apply to these imports.
- **Capital goods-** Laptops, tablets, all-in-one PCs, and ultra-small form factor computers essential for capital goods are also exempted.
- **Research and development-** It allows upto 20 items import per consignment without a license.
- These items must not be sold and must be either destroyed or re-exported after the intended purpose.

What is the need for such a move?

- **Global player-** It aims to reduce reliance on foreign markets and to make India a global manufacturing hub.
- **Boost domestic manufacturing-** It shows strong commitment to promote local production, thus giving impetus to "Make in India".
- **Investment destination-** It will boost top companies around the globe to proactively invest in India.

- **National Security-** Hardware from 'non-trusted' sources could come with 'built-in security loopholes' endangering sensitive personal and enterprise data.
- This move will curb imports from China and ensure citizen's security.
- **Boosts PLI -** The government has taken this step to boost the production-linked incentive (PLI) scheme for IT hardware.
- The mandate is also in compliance with the World Trade Organisation

For target segments, the PLI scheme provides incentive of 4% to 6% on incremental sales over the base year for goods manufactured in India.

What are the challenges of the move?

- **Supply shortages**- It will lead to unnecessary disruption in the immediate term, and price surge.
- The consignments were stuck at port and warehouses.
- **Cost disadvantages-** It may force the companies to manufacture in India, but it has its own challenges in terms of price, investment etc.,
- **Bureaucratic discretion-** It could open the door for imposition of similar licensing requirements in other sector.
- **Red tapism-** The importer needs to register with the government and need to then pay 0.1% fee just for application but there is no guarantee if or when approval will be given.
- **Back to license raj-** Since, all business decisions will need government approval, it increases uncertainty and hampers economic progress.
- **Focus on structural changes**
  - Inadequate infrastructure and supply chain,
  - High financing costs,
  - Inadequate skill and power availability etc.,

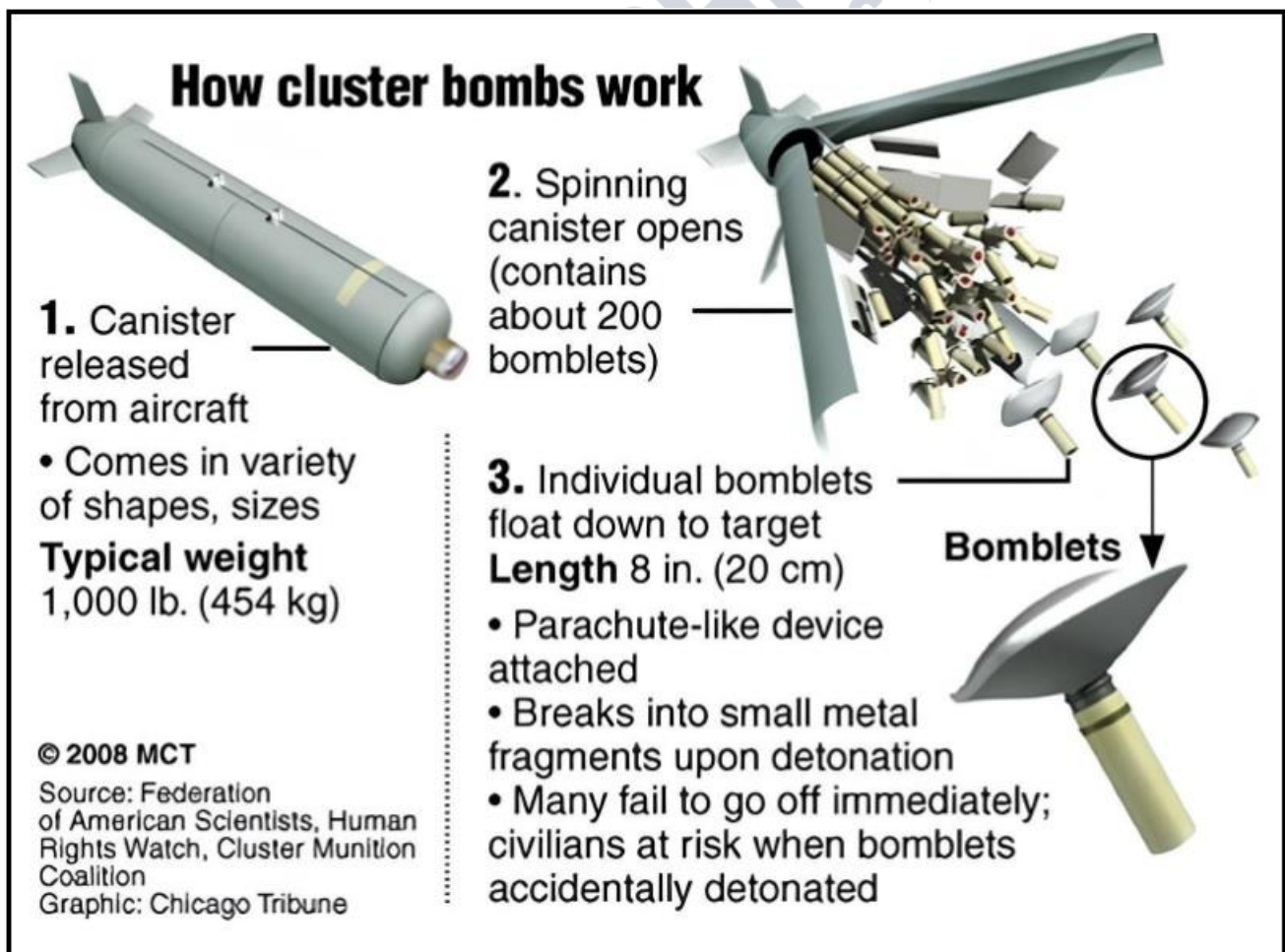| Rajaraman Committee |
|---|
| • The Rajaraman Committee Report (1981) set the stage for the import of computers and their parts. |
| • It led to |
| o Computerisation of Indian Railways passenger reservation system |
| o Progressive entry of computers into India's financial sector |
| o Catalysed India's IT revolution |
| • It proposed concessions for the import of computers against software exports. |

19. Cluster Bomb

United States has decided to send cluster munitions to Ukraine, as a part of a new military aid package to bolster Ukraine's war efforts against Russia.

Cluster bomb

- **Cluster bomb** - These are weapons that release multiple explosive sub munitions, also called bomblets, into the air.
- These sub munitions explode as soon as they hit the ground, killing and maiming people in the area.
- **Dud rate**- Many bomblets do not blow up instantly and remain dormant for years which is also known as the dud rate.
- These inactive bomblets act as precarious landmines, posing a grave threat to the civilian population.

How cluster bombs work

1. Canister released from aircraft
- Comes in variety of shapes, sizes
Typical weight 1,000 lb. (454 kg)

2. Spinning canister opens (contains about 200 bomblets)

3. Individual bomblets float down to target
Length 8 in. (20 cm)
- Parachute-like device attached
- Breaks into small metal fragments upon detonation
- Many fail to go off immediately; civilians at risk when bomblets accidentally detonated

Bomblets

© 2008 MCT
Source: Federation of American Scientists, Human Rights Watch, Cluster Munition Coalition
Graphic: Chicago Tribune

What are the instances of cluster bomb?

According to the Cluster Munition Monitor, anywhere between 56,000 to 86,000 people have died in cluster munition-affected countries, since the 1960s.

- They were used in the Second World War, since then, cluster bombs have been used on multiple occasions including by the U.S. in the wars in Vietnam, Afghanistan, and Iraq.
- According to the Cluster Munition Monitor, a total of 34 states have at one time developed or produced over 200 types of cluster munitions.

About	Countries
Countries affected by cluster munition remnants	Afghanistan, Azerbaijan, Libya, Somalia, Sudan, Chad, Chile etc.,
Most affected countries	Lao PDR, Vietnam, Cambodia, Iraq, Syria and Yemen
Unclear data	Colombia and Georgia

What efforts were taken against cluster bombs?

- **Human Rights Watch-** It is a civil society organisation which launched international campaign against cluster bombs.
- **Convention on Cluster Munition-** Launched in 2008, it is the only international framework which provides for eradication of cluster bombs.
- **Cluster Munition Coalition-** It is a global civil society campaign working to
    o Eradicate cluster munitions,
    o Prevent further casualties and
    o Put an end to the suffering caused by these weapons.

Convention on Cluster Munition (CCM)

- It was enacted in 2008 as a major step to eradicate cluster bombs.
- **Membership-** About 112 countries including many North Atlantic Treaty Organization (NATO) members such as Canada, Germany, France, and the United Kingdom.
- **Non-signatory countries-** Countries such as U.S., Russia, Ukraine, China, Israel, and India have not signed the CCM.
- **Feature-** It bans the use, production, stockpiling, and transfer of cluster bombs.
- The convention further obligates countries to destroy existing stockpile of cluster munitions in their possession.
- The countries are legally bound to provide support and rehabilitation to the cluster bomb victims in their jurisdiction.

Non-Signatories of the 2008 Convention on Cluster Munitions

As of August 2022
Source: Landmine and Cluster Munition Monitor

What is customary international law?

Both Russia and Ukraine are not members to the CCM, but use of cluster bombs is the violation of International law.

- **International law on armed conflict-** It has always drawn a distinction between combatants and civilian populations and between civilian objects and military objectives.
- Given the nature of cluster bombs, their usage is a classic example of indiscriminate use of force that fails to differentiate between combatants and civilians which is illegal.
- **Essential canon-** The use of force must be discriminate, that is, the force should target specific military objectives and not civilians.
- **Geneva Conventions, 1949-** The customary international law is codified in this convention to which both Russia and Ukraine are members.

- The use of cluster bombs is inherently indiscriminate, harming civilians, and will amount to disproportionate use of force.

Proportionality that is mentioned in Geneva Convention prohibits excessive use of force that causes incidental damage to the civilian population or civilian objects, when compared to military benefits.

What lies ahead?

- The usage and the possession and transfer or supply of cluster bombs should be banned universally, as envisaged in the CCM.
- All United Nations member-countries should accede to the CCM and eradicate cluster bombs from the face of the earth.

5. Maui Wildfires

A devastating wildfire swept through Maui, Hawaii, leading to destruction, fatalities, and evacuations.

- Maui is an island in the Central Pacific, part of the Hawaiian archipelago. The Hawaiian Islands are an archipelago of eight major volcanic islands, several atolls, and numerous smaller islets in the North Pacific Ocean, extending some 1,500 miles from the island of Hawai'i in the south to the northernmost Kure Atoll.
- Formation: The Hawaiian Islands were formed by a hot spot occurring in the middle of the Pacific Plate. While the hot spot itself is fixed, the plate is moving. So, as the plate moved over the hot spot, the string of islands that make up the Hawaiian Island chain was formed.

Causes of forest fires

- **Natural causes** like lightning can set fires on trees which may be spread by wind. Sometimes, high atmospheric temperatures and dryness (low humidity) offer favourable circumstances for a fire to start.
- **Man-made causes** are usually the ones that become dangerous. Fire is caused when a source of fire like a naked flame, cigarette, electric spark, or any source of ignition comes into contact with inflammable material.
- **Other human-led causes** are land clearing and other agricultural activities, maintenance of grasslands for livestock management, extraction of non-wood forest products, industrial development, resettlement, hunting, negligence, and arson.

Impact of forest fires

- Variations in the mineral composition and geochemical transformations that deplete soil health.
- Affects the density and diversity of insects like grasshoppers, amphibians and other reptiles.
- Cause great havoc to the habitat of the wildlife species.
- Cause the release of large quantities of carbon dioxide, carbon monoxide and other fine particulate matter into the atmosphere causing air pollution.
- Attempting to clear weeds with fires has in some cases been a further catalyser of its growth and spread.

Management of forest fires:

- The Forest Survey of India along with state disaster management has chalked several forest fire management plans that operate at various levels.
- Classification of fire-prone areas into high, medium and low-risk areas.
- Taking account of the quantum of inflammable content i.e. fuel load (dry vegetation, history of forest fires and human activities).
- Operationalization of fire plans at the station, range, divisional and circle levels.
- Use of fire breaks or fire lines that are small areas of cleared ditches and counter fires that act as efficient barrier to reduce the intensity and further spread of fires
- Check on local community activities like during festivals peaking in summer, people setting forests on fire is common.
- Engaging local communities who can act as fire watchers of the fire gangs.
- Use of robust technology to map and detect forest fire, use of GIS, Satellite-based remote sensing like MODIS (Moderate Resolution Imaging Spectro-radiometer) and SNPP-VIIRS (Suomi-National Polar-orbiting Partnership – Visible Infrared Imaging Radiometer Suite).

National initiative for forest fire management:

- Forest fire prevention and management scheme – for states to deal with forest fires.
- National action plan for forest fires (NAPFF) 2018 – by informing and creating awareness among local communities and incentivizing them for helping in forest fire mitigation.

Conclusion:

The forests serve as efficient means to mitigate climate change serving as carbon sinks. However, their burning has turned them into carbon producers further negatively contributing to climate change. The forest department along with the

local communities need to work in tandem to control this serious issue that has multiple adverse environmental impacts.

5. Saving the Amazon rainforest

Rapid deforestation in recent years has contributed to the ecosystem teetering on the brink of disaster by affecting the resilience of the Amazon rainforest.

Details:

- Amazonia and its massive river basin straddles several countries — close to 60% of it is in Brazil, 13% is in Peru, 8% in Bolivia, 7% and 6% respectively in Colombia and Venezuela, and nearly 3% each in Guyana and Suriname and around 1% in French Guiana and Ecuador.
- The Amazon rainforest or Amazonia constitutes close to 1.3% of the planet's surface and 4.1% of the earth's land surface.
- By storing around 76 billion tonnes of carbon, the Amazon rainforest helps stabilize the world's climate.

Conserving the Amazon Rainforest

- Amazon Cooperation Treaty Organization (ACTO) — in Belem do Para, Brazil. Brought out the "Belem Declaration".
- It calls for cooperation between the countries to ensure the survival of the humongous Amazon rainforest.
- Brazil and other Amazon countries come together to promise concerted efforts to arrest deforestation by illegal mining and logging.
- They also agreed to bring about integrated fire management and protection of the rights of Indigenous people. But they failed to lay down clear goals.

20. Security situation in Jammu and Kashmir (J&K)

On 5 August 2019, the Centre repealed **Article 370**, claiming that it was required to end terrorism in Jammu and Kashmir.

- There are changes in the security condition in Jammu and Kashmir (J&K) after the removal of Article 370.

Changes in Security situation in Jammu and Kashmir (J&K):

Stone pelting:

- The incidents of stone-throwing have been reduced to virtually zero due to presence of security forces and the harsh action taken by central agencies like the **National Investigation Agency (NIA).**
- There were **76 incidents of stone pelting** in 2021, as compared to earlier years.
- The **injuries** to **security forces** fell from 64 in 2019 to just 10 in 2021.
- 25 civilians sustained **injuries due to pellet guns and baton charges** in 2021.
- There were only 20 **law and order incidents** in J&K in 2022.

Arrests of militants:

- **Arrests** of **over-ground workers (OGWs)** of militant groups **increased f**rom 82 in 2019 (Jan-July) to 178 in the corresponding period in 2021.
- Government data showed a **decline of 32% in acts of terrorism** between 2019 to 2022.
- **Deaths of security forces fell** by 52%, and deaths of citizens by 14%.
- A **reduction of 14%** was recorded in the **admission** of terrorists.

Targeted killings:

- There was a **spate of killings of civilians**, especially of Kashmiri Hindus and non-Kashmiris in the Valley.
- More than **50% of all civilians** killed since 2019, had been killed in the **past eight months.**
- The killings were aided by dropping of **small weapons using low-cost drones** from across the border, and the engagement of **alleged part-time militants** by handlers **in Pakistan.**
- There were attempts to attack Hindu-dominated areas in Jammu by the militants.
- The police arrested around 20 militants and recovered multiple i**mprovised explosive devices (IEDs)** allegedly intended for use in Hindu areas.
- The killing of **Hindu civilians in Jammu** had not been heard of since many years.
- There has been **frequent infiltration in Jammu**, and **armed forces personnel** have been killed in gunfights with **elusive attackers.**

21. Lunar South Pole Mission: Russia's Luna 25 and India's Chandrayaan-3

- The moon exploration scene has intensified as Russia's "Luna 25" mission prepares for a soft landing near the lunar South Pole, challenging India's "Chandrayaan-3" in the race to touch down first.

- While Luna 25's earlier launch and more direct trajectory give it an edge, Chandrayaan-3's unique features and India-Russia collaboration in space activities also merit attention.

Luna 25's Accelerated Journey

- **Launch and Orbit:** Luna 25 was launched on August 10, aiming to enter lunar orbit by August 16.
- **Lunar Landing Date:** The Russian lander is anticipated to attempt a soft landing between August 21 and 22, ahead of Chandrayaan-3's possible landing date of August 23.

Key Factors behind Luna 25's Lead

- **Trajectory and Fuel Storage:** Luna 25 followed a direct trajectory due to its lighter payload and higher fuel efficiency.
- **Payload Comparison:** Luna 25's lift-off mass is 1,750 kg, significantly lighter than Chandrayaan-3's 3,900 kg. The latter includes a Lander-Rover and propulsion module.
- **Lunar Dawn Advantage:** Luna 25 benefits from an earlier lunar dawn at its landing site, ensuring optimal power generation through solar panels.

Chandrayaan-3's Distinct Features

- **Coated Rover:** Chandrayaan-3 boasts a rover with a 500-metre range, unlike Luna 25.
- **Scientific Objectives:** Chandrayaan-3 emphasizes soil and water-ice study, especially near the southern pole, owing to craters in permanent shadow.
- **Experiment Suite:** Chandrayaan-3's Lander carries experiments like RAMBHA, ChaSTE, ILSA, and LRA, providing crucial insights into moon's properties.

Collaboration and Competition

- **India-Russia Space Collaboration:** Both countries have collaborated extensively in space activities, such as Russia's contribution to India's Chandrayaan-2 mission's lander-rover design.
- **Chandrayaan-1 to Chandrayaan-2 Gap:** India developed its lander-rover technology independently after Russia's withdrawal, leading to an 11-year gap between Chandrayaan-1 and Chandrayaan-2 missions.

Future Prospects

- **Human Moon Missions Race:** India, the US, and China are actively pursuing human moon missions after India's Chandrayaan-1's water molecule discovery in 2008.
- **Progress and Challenges:** While India has made strides, countries like the US and China have achieved landing and sample return missions. India's efforts to develop heavier launch vehicles for more ambitious missions continue.

22. Catalysing youth well-being: Beyond a human capital approach

- A recent study, as depicted in the Youth Well-being Framework, underscores the multifaceted nature of well-being among the younger population. This framework serves as a guiding principle for policymakers and societies alike to holistically address the needs of adolescents.

- Investing in youth is recognized as a cornerstone for human capital advancement. This investment goes beyond economic implications, integral to intrinsic well-being. Modern youth development covers various factors— physical health, nutrition, skills, employability. While physical and mental health are vital, well-being extends to personal experiences, life quality assessments.

What is youth well-being framework?

- The Youth Well-being Framework is a comprehensive and multidimensional approach to assessing and promoting the well-being of young individuals.
- It goes beyond traditional measures of well-being that focus solely on economic indicators and instead considers a wide range of factors that contribute to the overall quality of life and life satisfaction of young people.
- **Key domains:**

- **Physical Health:** This domain includes factors such as access to healthcare, nutrition, physical activity, and overall health status. It recognizes the importance of physical well-being as a foundational element for a good quality of life.
- **Mental and Emotional Well-being:** Mental health, emotional resilience, and psychological well-being are essential components of this domain. It addresses issues like stress, anxiety, depression, and other mental health challenges that young individuals may face.
- **Social Connections:** This domain focuses on the importance of social relationships, friendships, family support, and a sense of belonging. Positive social connections are vital for emotional well-being and overall life satisfaction.

- **Education and Skills Development:** Access to quality education, skills training, and the ability to acquire knowledge and competencies for personal and professional growth are central to this domain.
- **Economic Empowerment:** This domain emphasizes the importance of economic opportunities, employment prospects, and financial stability for young people as they transition into adulthood.
- **Human Rights and Empowerment:** Recognizing the rights of young individuals and empowering them to participate in decision-making processes, engage in civic activities, and contribute to their communities are key aspects of this domain.
- **Subjective Well-being:** Beyond objective measures, this domain considers young people's subjective experiences and perceptions of their own well-being and life satisfaction.
- **Social and Cultural Context:** The broader social and cultural environment in which young people live influences their well-being. This domain takes into account factors like cultural norms, social inequalities, and policy frameworks.

Linking youth well-being with Sustainable Development Goals

- **SDG 3 – Good Health and Well-being:** Investing in the well-being of young individuals during the critical transition to adulthood establishes lifelong health habits.
- **SDG 4 – Quality Education:** Access to quality education equips youth with essential skills, enabling informed decisions about their lives and contributing to overall well-being.
- **SDG 8 – Decent Work and Economic Growth:** Empowering youth with meaningful employment opportunities enhances financial well-being, purpose, and self-esteem.
- **SDG 10 – Reduced Inequality:** Addressing structural inequalities supports the well-being of marginalized youth, promoting equality and inclusivity.
- **SDG 16 – Peace, Justice, and Strong Institutions:** Creating safe environments for youth by addressing issues like violence and discrimination contributes to overall well-being.
- **SDG 17 – Partnerships for the Goals:** Engaging youth in decision-making and policy processes amplifies the impact of sustainable development efforts.

What are the challenges?

- **Health Disparities:** Ensuring good health and well-being for all youth is hindered by disparities in access to healthcare and nutritious food, especially among marginalized groups.

- **Education Inequities:** Quality education remains elusive for many young individuals, particularly those in disadvantaged regions, due to inadequate infrastructure, resources, and skilled educators.
- **Youth Employment:** Providing decent work and economic opportunities for youth is a challenge, exacerbated by global economic fluctuations and the changing nature of work.
- **Marginalization:** Vulnerable groups, including ethnic minorities and those with disabilities, face discrimination, limiting their access to education, healthcare, and economic opportunities.
- **Mental Health:** The prevalence of mental health issues among youth, exacerbated by factors like the COVID-19 pandemic, poses a significant challenge to overall well-being.
- **Inclusive Governance:** Involving youth in decision-making processes is often hindered by institutional barriers and lack of platforms for meaningful participation.
- **Inadequate Resources:** Insufficient financial investment in youth-related programs, education, and healthcare limits progress in enhancing well-being.
- **Data Gaps:** Lack of comprehensive data on youth well-being and its intersections with SDGs hampers evidence-based policymaking

A human rights approach to youth well-being

- **Empowerment:** Empowering marginalized groups by advocating for their rights and providing opportunities for personal growth and societal progress.
- **Inclusion:** Mainstreaming youth perspectives into government departments, policymaking, and budget allocation for youth development.
- **Equity:** Addressing power imbalances and discrimination to ensure equal access to education, healthcare, and economic opportunities.
- **Progress Monitoring:** Monitoring youth progress and well-being to ensure that policies and initiatives effectively cater to their needs.
- **Youth Participation:** Engaging youth in policymaking and community development projects, fostering their sense of purpose and contributing to positive change.

Way forward

- **Empowering Youth Voices:** Actively involve young individuals in decision-making processes, policy formulation, and community initiatives. Their unique perspectives and insights are essential for effective solutions.
- **Creating Safe Spaces:** Establish platforms where youth can express themselves without fear of discrimination. Safe spaces encourage open dialogue and the sharing of diverse viewpoints.

- **Youth-Led Projects:** Support and fund projects initiated by young people that address local challenges. These initiatives empower youth to drive positive change within their communities.
- **Education for Empowerment:** Design education programs that equip young individuals with critical thinking skills, empowering them to engage constructively in society and effect meaningful change.
- **Diverse Representation:** Ensure diverse representation of youth, including those from marginalized backgrounds and ethnic minorities, in decision-making bodies and leadership roles.
- **Equal Access to Opportunities:** Remove barriers that hinder marginalized youth from accessing education, healthcare, and employment opportunities. Promote equitable access to resources.
- **Collaborative Networks:** Build networks that connect youth with mentors, professionals, and organizations. Such networks provide guidance, exposure, and pathways for personal and professional growth.
- **Data-Driven Strategies:** Gather data on the challenges faced by different youth groups. Utilize this data to tailor policies and programs that address specific needs and enhance overall well-being

Conclusion

- Investing in youth well-being extends beyond economic growth, encompassing physical health, mental resilience, education, and empowerment. The alignment with SDGs, adoption of human rights principles, and inclusive policies are pivotal for fostering holistic youth development. Empowering youth to shape their future ensures a brighter and more prosperous society for all.

23. ISRO gears up for Aditya-L1 Mission

- Although the mission launch date is yet to be announced, the Aditya-L1 satellite has arrived at the Satish Dhawan Space Center (SDSC) in Sriharikota, Andhra Pradesh, for integration with the launch vehicle, PSLV.

Aditya-L1 Mission

- Aditya-L1's primary objective is to closely observe the Sun and gather insights into its corona, solar emissions, flares, solar winds, and Coronal Mass Ejections (CMEs).
- The satellite is equipped with seven advanced payloads for these scientific endeavors.
- The mission promises round-the-clock imaging of the Sun, enabling an unprecedented understanding of its behavior and impacts.

Significance of the mission

- **Solar Influence:** The evolution of every celestial body, including Earth and distant exoplanets, is intricately linked to its parent star. The Sun's weather and environment have a profound impact on the entire solar system.
- **Space Weather Impact:** Variations in solar activity can disrupt satellite orbits, damage electronics, trigger power blackouts, and induce disturbances on Earth. Accurate knowledge of solar events is essential for comprehending and predicting space weather phenomena.

L1 Lagrange Point Advantage

- **Continuous Solar Observations:** Positioned at the Lagrangian Point 1 (L1) — about 1.5 million km from Earth — Aditya-L1 will be uniquely positioned to observe the Sun without the interference of occultation or eclipses. L1 is an orbital location where gravitational forces create stable regions of attraction and repulsion.
- **L1's Significance:** The Solar and Heliospheric Observatory Satellite (SOHO) is stationed at L1 and has facilitated groundbreaking solar research. Aditya-L1's observations will contribute to a more comprehensive understanding of solar behavior.

Comparison with International Missions

- **Closer than Ever:** While NASA's Parker Solar Probe has ventured closer to the Sun, Aditya-L1 will focus on direct solar observations from a greater distance.
- **Technical Challenges:** Many instruments and components for Aditya-L1 are being developed in India for the first time, representing both a challenge and an opportunity for the nation's scientific and engineering communities.

24. Open Market Sale Scheme scheme

The Centre has decided to release 50 Lakh Metric Tonnes of wheat and 25 LMT of rice through E-auctions under the **Open Market Sale Scheme (Domestic) or OMSS (D) scheme.**

Open Market Sale Scheme scheme (OMSS)

- **Launched: 1965.**
- **Ministry: Ministry of Agriculture.**
- **Implementing Agency: Food Corporation of India (FCI).**

- **Objectives:** to enhance the supply of food grains (ensuring food security) during the lean season and thereby moderate the open market prices (controlling inflation), especially in the deficit regions.

Salient Features of OMSS:-

- The purpose of OMSS is **to dispose of surplus stocks of wheat and rice held by FCI** and to regulate the prices of wheat in the open market.
- Under the OMSS, the **FCI from time to time sells surplus food grains** from the central pool, especially wheat and rice in the open market to traders, bulk consumers, retail chains, etc., at predetermined prices.
- The **FCI does this through e-auctions** where open market bidders can buy specified quantities.
- FCI conducts weekly auctions for the OMSS for wheat on the platform of the National Commodity and Derivatives Exchange Limited (NCDEX).
  - **NCDEX:** a commodity exchange platform in India that provides a platform for trading in various agricultural and other commodities.
- **States are also allowed to procure food grains** through the OMSS without participating in the auctions, for their needs.

Revision of OMSS:-

- The Centre decided to **restrict the quantity** that a single bidder can purchase from 3,000 metric tonnes (MT) to 10-100 MT.
- This was done to **accommodate more small and marginal buyers**, curb retail prices as allowing smaller bids should ideally break monopolies of bulk buyers, allowing more competitive bids by small buyers

Steps Taken by States:-

- States are considering **alternative methods** of obtaining wheat and rice.
- For example, TN is trying to purchase rice from government agencies other than FCI.

25. Zero Revenue Deficit

In the post pandemic fiscal strategy, the "golden rule" of targeting zero revenue deficit is gaining attention as a powerful mantra of fiscal discipline.

Related Terms	
Fiscal deficit	• It is defined as excess of total budget expenditure over total budget receipts excluding borrowings during a fiscal year. ○ Fiscal deficit = Total expenditure – Total receipts

	excluding borrowings
Primary Deficit	• It is defined as fiscal deficit of current year minus interest payments on previous borrowings. o Primary deficit = Fiscal deficit-Interest payments
Revenue deficit	• It is excess of total revenue expenditure of the government over its total revenue receipts. o Revenue deficit = Total revenue expenditure – Total revenue receipts
Zero revenue deficit	• It is a fiscal strategy that aims to balance revenue receipts and revenue expenditure. • There is no requirement for borrowing to clear interest payment pending. • It urges governments to judiciously utilize borrowings primarily for capital investments.

Why there is a need to target Zero Revenue Deficit?

- **Focus on fiscal space-** The primary deficit excludes past interest payment obligations, allowing to focus on the discretionary fiscal space accessible for shaping expenditure patterns.
- **Judicious fiscal management** - Focussing on primary deficit could stimulate government to exercise heightened caution regarding the available fiscal space before making expenditure decisions.
- It is helpful particularly during the period of economic uncertainty.
- **Capital formation**- Removal of Plan and non-Plan distinction alongside the revenue and capital demarcation constitutes a noteworthy evolution in India's budgetary landscape.
- This paradigm shift acknowledges that certain revenue expenditures contribute to capital formation.
- **Effective revenue deficit-** It is the difference between revenue deficit and grants for creation of capital assets.
- The concept of effective revenue deficit has been suggested by the Rangarajan Committee on Public Expenditure.
- It is aimed to deduct the money used out of borrowing to finance capital expenditure thus creating space for increased capital spending.
- **Growth without lag-** A mindless transition to capex, ignoring revenue expenditure, can be detrimental.

- **Budget credibility-** Efficiency of public expenditure in social infrastructure will help the lower income quintiles access public education and public health in India.

Fiscal marksmanship is known as the discrepancies between budgeted figures (Budget Estimates) and actual expenditure.

- **Ideal concept of deficit**- Public Sector Borrowing Requirement (PSBR) emerges as a comprehensive measure of the authentic macroeconomic gap.
- It accounts for the resource gap of the general government encompassing all tiers and public sector deficits.

In the 2018 amendment to the Fiscal Responsibility and Budget Management (FRBM) Rules 2004, the "golden rule" of zero revenue deficit was eliminated.

What are the challenges in achieving zero revenue deficit?

- **Lack of feasibility-** It affects human capital formation and the economic growth process.
- **Revenue expenditure compression**- When revenues are increasingly uncertain, the fiscal consolidation path towards zero revenue deficit might occur through this method.
- **Humanitarian crisis-** If it is attained through compression in revenue spending in social sector, it can trigger a humanitarian crisis amidst widening inequalities.
- **Volatile**- State's fiscal space is affected when revenue reduction compression is followed in inter-governmental fiscal transfers from the Centre.
- **Issues with contingent liabilities-** A contingent liability is defined as a liability which may arise depending on the outcome of a specific event.
- The recent announcement that the contingent liabilities will be considered within the net borrowing ceiling limit affects the State's fiscal space.
- **Affects cooperative federalism-** Fiscal rules have been tied to energy transition in which both will move together against COP27 commitments.
- It will affect the states extra borrowing powers of 0.5% within the 3.5% fiscal deficit to GDP ratio.
- **High ratio of interest payments**- A heightened ratio of interest payments in comparison to revenue receipts poses a threat to long-term fiscal sustainability.
- **16th finance commission**- It prompts inquiry whether the commission will consider articulating thresholds for fiscal risk ratios instead of adhering to a blanket fiscal rule advocating zero revenue deficit.

What lies ahead?

- In the ever-evolving landscape shaped by the aftermath of the pandemic, the imperative for a judicious fiscal path resonates with heightened significance.
- Rethinking of fiscal rules, especially going for zero revenue deficit should be placed within the complex frameworks of Indian public finance

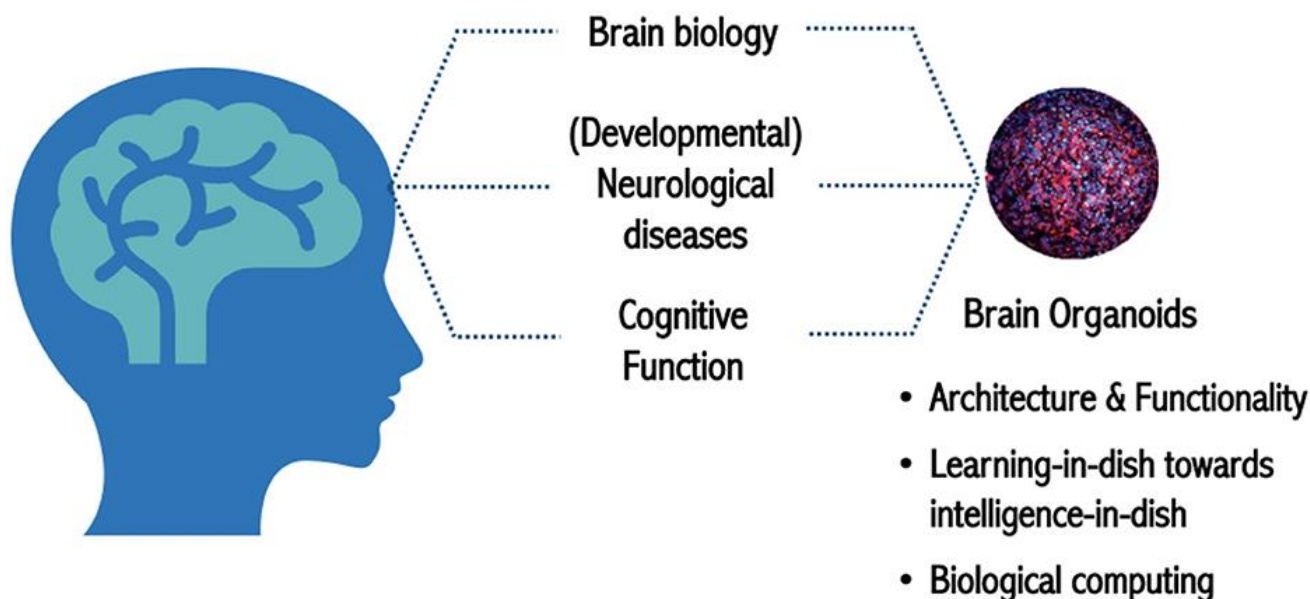## 26. Organoid Intelligence: Biology and the future of computing

- By utilizing brain organoids derived from stem cells, Organoid Intelligence (OI) seeks to explore new frontiers in information processing, offering potential breakthroughs in understanding brain functionality, learning, and memory.

- In recent years, Artificial Intelligence (AI) has brought forth remarkable technological advancements. Yet, the realm of cognitive computing is being further extended by Organoid Intelligence (OI), a burgeoning interdisciplinary domain that envisions innovative biocomputing models.

Organoid

- An organoid is a specialized type of tissue culture that is generated from stem cells and intended to mimic the structure and function of specific organs.
- These three-dimensional structures are cultivated in vitro, or outside the body, under controlled conditions that attempt to recreate the microenvironment of the target organ.
- The term organoid encompasses diverse structures that imitate different organs or tissues.

What is Organoid Intelligence (OI)?

- Organoid Intelligence is an emerging multidisciplinary field that merges the realms of biology and computing to explore the potential of using brain organoids to achieve cognitive capabilities and enhance our understanding of brain function.
- This novel concept envisions harnessing the unique properties of brain organoids, which mimic certain aspects of brain structure and function, to develop biocomputing models that could process information and potentially exhibit rudimentary cognitive abilities.

Brain biology

(Developmental) Neurological diseases

Cognitive Function

Brain Organoids

- Architecture & Functionality
- Learning-in-dish towards intelligence-in-dish
- Biological computing

Potential applications of OI

- **Cognitive Computing:** Integrating brain organoids and computation for information processing and adaptive learning.
- **Disease Modeling and Drug Testing:** Using organoids to simulate diseases, test treatments, and study cognitive aspects.
- **Understanding Brain Development:** Analyzing Organoids to grasp early brain stages and cellular memory processes.
- **Personalized Brain Organoids:** Tailoring organoids to study genetics, medicine, and cognitive conditions.
- **Advantages over Traditional Computing:** Exploring organoids' capabilities for intricate data tasks and energy-efficient processing.
- **Biocomputers and Energy Efficiency:** Developing faster, greener biocomputers with brain organoids.
- **Ethical Considerations:** Addressing ethical concerns like informed consent, gene editing rules, and inclusive access.
- **Sustainable Alternatives:** Offering eco-friendly options for intensive cognitive tasks and learning, amidst technology advancement.

Case Study: DishBrain System Experiment

- The DishBrain system stands as a compelling case study illustrating the application of Organoid Intelligence (OI). This innovative experiment, led by a team of researchers from Cortical Labs in Melbourne, demonstrates the integration of brain organoids with computational systems to achieve rudimentary cognitive capabilities.
- **Experiment Overview:**

- **Brain Organoid Culturing:** The researchers cultivated brain organoids, which are complex three-dimensional structures derived from stem cells. These organoids simulate certain aspects of brain development and function.
- **In Silico Integration:** Brain organoids were interfaced with computational simulations and algorithms through in silico computing. This integration aimed to enable enhanced neural processing and cognitive functions.
- **Gameplay: Pong':** The brain organoids were trained to engage in the classic video game Pong. They were programmed to respond to key in-game variables, such as the movement of the virtual ball.
- **Learning Mechanism:** When the brain organoids failed to respond correctly in the game, the system provided feedback in the form of electrical pulses. This approach mimics the concept of reinforcement learning observed in living organisms.
- **Application of the Free-Energy Principle:** In the absence of real-time incentive systems like dopamine pathways, the researchers employed the free-energy principle. This principle suggests that living systems strive to minimize unpredictability. Brain organoids adapted their behavior to make the game environment more predictable.
- **Key Outcomes:** Within an astonishingly short span of five minutes, the brain organoids demonstrated signs of learning in response to the game stimuli. The utilization of the free-energy principle showcased the potential to guide the behavior of brain organoids using computational principles, driving them toward predictable responses.

Challenges and ethical considerations associated with Organoid Intelligence

- **Challenges:**
    - **Technological Advancements:** Scaling up brain organoids and enhancing their cognitive capacities pose significant technical hurdles. Developing more sophisticated blood flow systems and introducing diverse cell types are among the challenges.
    - **Complexity of Learning:** Despite promising results, achieving advanced cognitive capabilities in brain organoids remains a complex task. Imitating the intricacies of learning and memory seen in human brains is a challenge that requires further research.
    - **Gap in Knowledge:** There are aspects of OI technology that are yet to be fully understood and developed. This includes improving memory storage mechanisms within brain organoids to enable more complex cognitive functions.
- **Ethical Considerations:**
    - **Informed Consent:** Obtaining voluntary informed consent for cell donation is crucial to upholding donors' rights and dignity.

- o **Selection Bias and Discrimination:** Preventing selection biases during organoid development is essential to avoid potential discrimination risks and ensure neurodiversity.
- o **Gene Editing Regulations:** Balancing commercial interests with ethical gene editing regulations is necessary to ensure the responsible and ethical culturing of brain organoids.
- o **Data Sharing and Open Access:** Ensuring data sharing and open access to OI technology promotes inclusivity and diverse knowledge generation.
- o **Stakeholder-Informed Regulations:** Developing regulations for the ethical use of OI technology requires stakeholder input to ensure responsible applications.
- o **Consciousness and Suffering Concerns:** Ethical concerns range from the potential consciousness of brain organoids to addressing the possibility of suffering in these bioengineered systems.

Technological Advancements and Future Prospects

- Scaling up brain organoids, introducing diverse cell types, and enhancing memory storage are essential steps for augmenting OI's cognitive potential.
- A 100-fold increase in the number of cells could yield complex cognitive capabilities, necessitating innovations in blood flow systems and cell diversity incorporation.
- The rudimentary success of DishBrain's Pong experiment signifies the journey towards intelligence through OI.
- Although complete realization is distant, the limitations of current AI and silicon technologies in complex cognition, learning, and energy efficiency emphasize the urgency to explore sustainable alternatives.

Conclusion

- Through brain organoids, researchers are poised to unlock an unprecedented understanding of cognitive processes and revolutionize the ways we approach learning, memory, and neurological disorders. As OI advances, navigating ethical considerations and embracing technological innovations will be pivotal in ensuring a responsible and impactful journey toward an era of more sustainable and intelligent computing solutions.

27. NASA to test a nuclear rocket in space

The **National Aeronautics and Space Administration (NASA)** would develop a nuclear propulsion system that could **reduce half of the travel time to Mars.**

Demonstration Rocket for Agile Cislunar Operations (DRACO):

Development and Features of DRACO:

- DRACO was announced by **NASA** and the **Defense Advanced Research Projects Agency (DARPA)**.
- It is a **propulsion system** that could **speed astronauts to Mars** using **nuclear fission** reactor at the heart of the engine.
- **Earth and Mars** come closer to each other every **26 months**, but it takes about **seven to nine months** for a spacecraft to reach Mars.
- If the spacecraft accelerates through the **first half of the journey** and then starts **slowing down again**, the travel time could be slashed.
- Current rocket engines **rely on** the combustion of a fuel like **hydrogen or methane with oxygen** but **do not** have enough **room to carry the increased propellant.**
- Nuclear reactions are **more efficient** as it generates energy from the **splitting of uranium atoms.**
- The DRACO **engine** would consist of a nuclear reactor that would heat hydrogen **from minus 420 degrees Fahrenheit to 4,400 degrees.**
- The **demonstration spacecraft** would orbit at an altitude between 435 and 1,240 miles.
- The reactor would **not be turned on until it reached space** as a precaution to **minimize** the possibility of a **radioactive accident** on Earth.
- The launch is scheduled for late **2025 or early 2026.**

Significance of DRACO:

- **Greater fuel efficiency** could speed up journeys to Mars, and **reduce the amount of time** astronauts spend exposed to the treacherous environment of deep space.
- It would stay in orbit for **more than 300 years**, or long enough for **radioactive elements** in the reactor fuel to **decay to safe levels.**
- The technology may allow **rapid maneuvers of military satellites** in orbit around Earth.
- The preliminary analyses found a **low probability of accidents** across the entire spectrum of possibilities.

Background of nuclear propulsion in space:

- Nuclear propulsion is when a **fission reactor** is used to **generate extremely high temperatures** in a nuclear thermal rocket engine.
- The **engine transfers the heat** produced by the reactor to a **liquid propellant**, which is expanded and exhausted through a **nozzle to propel the spacecraft**.

- Nuclear propulsion for space emerged in the **1950s and 1960s.**
- **Project Orion** was financed by NASA, the Air Force, and the Advanced Research Projects Agency by using the **explosions of atomic bombs** to accelerate spacecraft.
- **Project Rover** and **Project NERVA** aimed to develop **nuclear-thermal engines** similar to that being pursued by the DRACO program.
- A series of **23 reactors were built** and tested, but **none** were ever **launched** into space.
- NASA had contemplated using nuclear reactors to set up a **Lunar base** and propel space **probes to Jupiter, Saturn,** and beyond.
- A key **difference** between NERVA and DRACO is that **NERVA used weapons-grade uranium** for its reactors, while **DRACO** will use a **less-enriched form of uranium.**

28. De-dollarisation: Is it a gateway to rupeefication?

- Countries worldwide are pursuing de-dollarisation to reduce reliance on the US dollar in international trade, exploring bilateral currency agreements and strategies like rupeefication.

- In the past century, a single currency has dominated the global economy, transitioning from the pound sterling to the US dollar, now comprising 59.02% of COFER. The US dollar's prevalence is due to its pivotal role in international trade. India's push for the Indian Rupee's use in trade showcases this trend, aiming at bolstering economic autonomy.

Dollarisation

- **US dollar as a substitute for domestic currency:** Dollarisation refers to the phenomenon where countries adopt the US dollar as a substitute for their domestic currency to varying degrees.
- **This practice can take several forms:**

- Financial dollarisation (substituting domestic assets/liabilities with foreign ones)
- Real dollarisation (pegging domestic transactions to exchange rates)
- Transactional dollarisation (using the US dollar for domestic transactions)

- **Poor performance of the domestic currency:**

- Dollarisation typically arises due to the poor performance of the domestic currency, caused by factors such as political instability or economic uncertainty.

- It can also result from financial market liberalization and economic integration, leading to reduced exchange rate risk and increased capital inflow.

- **The US dollar's dominance:** The US dollar's dominance as an anchor currency for international trade contributes to its widespread acceptance and high demand, thereby driving dollarisation trends.

What is meant by De-dollarisation?

- De-Dollarisation refers to the global trend of countries reducing their reliance on the US dollar in international trade and financial transactions.
- This movement involves shifting towards bilateral currency agreements, using domestic currencies for trade, and promoting alternatives to the dollar.
- The aim is to achieve greater economic autonomy, reduce risks associated with dollar fluctuations, and challenge the dominance of the US dollar in the global financial system.

Rupeefication?

- Rupeefication refers to the process of internationalizing the Indian Rupee (INR) by promoting its use in international trade and financial transactions.
- This strategy involves enabling trade partners to transact in INR, issuing financial instruments denominated in INR to foreign entities, and facilitating greater access to the INR in global markets.
- The objective of rupeefication is to enhance the INR's status as a global currency, reduce dependence on the US dollar, and strengthen India's economic resilience and autonomy on the global stage.

De-dollarisation in motion

- **Brazil's Bilateral Currency Trade**: Brazil is expanding bilateral currency trade agreements, notably with Japan and China. These agreements involve using domestic currencies for trade, reducing reliance on the US dollar.
- **China's Leadership in De-Dollarisation**: Following sanctions against Russia, China has been at the forefront of reducing dollar reliance. China's actions have prompted other BRICS nations to follow suit in decreasing dollar usage.
- **Indonesia's Local Currency Trade System**: Indonesia has adopted a Local Currency Trade (LCT) system to lower the role of the US dollar in its current account transactions. This shift aims to promote greater usage of domestic currency.
- **Africa's Consideration for Intra-Africa Trade**: African nations are contemplating replacing the US dollar with domestic currencies for intra-

Africa trade. This approach aligns with the broader global trend of de-dollarisation.

- **BRICS Summit and Integrated Payment System**: The upcoming BRICS Summit will address the challenges of de-dollarising trade and establishing an integrated payment system. This reflects the growing global emphasis on reducing dollar dependence.
- **India's Multi-Faceted Approach**: India, while pursuing de-dollarisation, also considers bilateral currency agreements. However, it might opt out of a common BRICS currency due to existing trade commitments with the US and Europe

How is India actively advancing its systems to bypass the US dollar and fortify the INR?

- **Bilateral Currency Agreements**: India is engaging in bilateral currency agreements with multiple nations. These agreements encourage trade partners to transact in INR instead of the US dollar, reducing the reliance on the dollar in international trade transactions.
- **Special Rupee Vostro Accounts (SRVAs)**: India has established Special Rupee Vostro Accounts with various countries, including the UK, Russia, Sri Lanka, and Germany. These accounts enable foreign entities to transact in INR directly with Indian banks, promoting the use of the Indian currency.
- **Currency Internationalization**: By promoting the use of INR in international transactions, India aims to increase the acceptance of its currency in global markets. This strategy involves initiatives to make INR more widely recognized and used beyond its borders.
- **Reducing Dollar Dependency**: India's efforts to develop systems that bypass the dollar aim to reduce the country's dependence on the US dollar for international trade and financial transactions. This can enhance India's economic autonomy and mitigate the risks associated with fluctuations in the value of the dollar.
- **Enhancing the INR's Global Role**: Strengthening the INR involves making it a viable alternative to the US dollar in global transactions. By creating systems that support the use of INR in trade and finance, India aims to increase the currency's global significance.

Advantages of rupeefication

- **Risk Mitigation for Exporters**: Rupeefication provides exporters with a means to limit their exposure to exchange rate risks. By invoicing trade in INR, exporters can avoid the uncertainties associated with fluctuating US dollar exchange rates, enhancing predictability in their earnings.

- **Deepened Markets and Wider Access**: The adoption of rupeefication can lead to increased market access and deeper trade relationships. As the INR gains wider acceptance, exporters can tap into new markets and expand their customer base.
- **Lower Borrowing Costs for the Private Sector**: Rupeefication enables the private sector to access international financial markets with reduced borrowing costs. This can result in enhanced profitability and investment opportunities for businesses.
- **Public Sector Financing Flexibility**: The public sector benefits from the ability to issue international debt denominated in INR. This provides an alternative source of financing for government projects without depleting official US dollar reserves.
- **Strengthened Economic Autonomy**: By promoting rupeefication, India can gradually reduce its reliance on the US dollar, leading to increased economic autonomy. This reduces vulnerability to external economic shocks and fluctuations in the value of the dollar.
- **Microeconomic Growth and Livelihoods**: A focus on rupeefication encourages the growth of the private sector, leading to increased economic activities and job opportunities. This approach can contribute to the improvement of livelihoods across various sectors.
- **Enhanced Monetary Policy Autonomy**: As rupeefication gains traction, India can exercise more control over its domestic monetary policy. This autonomy allows for tailored economic measures that align with the country's specific needs.

Potential challenges associated with its implementation

- **Exchange Rate Volatility**: Shifting towards rupeefication could expose businesses to exchange rate volatility if the INR's value fluctuates significantly against other major currencies. This could impact the predictability of earnings and increase risks for exporters.
- **Limited Acceptance in International Markets**: Achieving widespread acceptance of the INR in global markets might be challenging. Many international transactions are still predominantly conducted in the US dollar, which could hinder the seamless adoption of rupeefication.
- **Global Economic and Political Factors**: External economic and political events can impact the feasibility of rupeefication. Global factors such as economic crises or geopolitical tensions could influence the willingness of other nations to engage in transactions using the INR.
- **Trade Balance and Reserves**: A swift shift to rupeefication might impact India's trade balance and foreign exchange reserves, potentially necessitating greater reserves of foreign currencies to manage trade deficits.

- **Gradual Implementation**: Rapidly transitioning to rupeefication might lead to economic disruptions.

Way forward

- **Gradual Transition**: To address the challenges and uncertainties associated with shifting towards rupeefication, a gradual and phased approach is recommended. This allows businesses, financial institutions, and the economy as a whole to adapt to the changes smoothly.
- **Macroeconomic Stability**: Maintaining macroeconomic stability is crucial. Efforts should be directed toward ensuring the stability of the INR's value to inspire confidence among trade partners and investors.
- **Promoting INR Use**: Initiatives to promote the use of the INR in international transactions should be continued. This could involve diplomatic efforts to foster bilateral agreements, increasing awareness about the benefits of INR invoicing, and addressing concerns about exchange rate risk.
- **Collaborative Approach**: Collaborating with other nations and international organizations is essential. The adoption of rupeefication requires cooperation and coordination among various stakeholders to establish the INR as a viable global currency.
- **Balancing Trade and Reserves**: Balancing trade and managing foreign exchange reserves remain crucial. Gradual rupeefication should align with maintaining a stable trade balance and adequate reserves to manage potential deficits.

Conclusion

- While the journey towards de-dollarisation and rupeefication is multifaceted and not devoid of challenges, India's persistent efforts to limit dollar reliance while nurturing the international status of the INR underscore its commitment to greater economic autonomy. By gradually integrating the INR into the global financial landscape, India aims to bolster its economic resilience, promote growth, and enhance its position as a global economic player.

29. Agnibaan: Pioneering with 3D-Printed Engines

- Chennai-based Agnikul Cosmos takes a significant step as it moves its innovative rocket, Agni-1, to Sriharikota for integration assessments.
- Successful integration checks could position Agnikul as the second Indian space-tech firm, following Skyroot Aerospace, to achieve suborbital space flight capability.

Agnikul's Remarkable Space Vehicle: Agnibaan

- Agnibaan SOrTeD is a single-stage launch vehicle powered by Agnikul's patented Agnilet semi-cryogenic engine.
- In contrast to traditional sounding rockets, Agnibaan SOrTeD's vertical take-off and precise trajectory enable orchestrated maneuvers during flight.

(A) Distinct Features of Agnibaan

- **Customizability:** The rocket offers custom launch configurations, either single or two-stage launches.
- **Impressive Dimensions:** Standing at 18 meters and weighing 14,000 kg, Agnibaan SOrTeD is a powerful presence.
- **Payload Capacity:** With a capacity for payloads of up to 100 kg, it can reach altitudes of 700 km in five different Lower Earth Orbits (LEOs).
- **Engine Configuration:** The first stage can house up to seven Agnilet engines, powered by Liquid Oxygen and Kerosene, dependent on the mission's requirements.
- **Versatile Launch:** Designed for launch from over 10 different launch ports.
- **Launch Pedestal 'Dhanush':** AgniKul's built 'Dhanush' supports the rocket's mobility across configurations, ensuring compatibility with multiple launch ports.
- **Cutting-Edge Agnilet Engine:** The world's sole single-piece 3D-printed engine powers the entire operation.

(B) Innovative Agnilet Engine

- **Heart of the Vehicle:** Agnilet engine, a 3D-printed, single-piece, 6 kN semi-cryogenic marvel, drives Agnibaan's propulsion.
- **Propellant Composition:** The engine employs a novel blend of liquid kerosene and supercold liquid oxygen as propellants, successfully tested at the Vikram Sarabhai Space Centre.

30. All about 3D Printing

Recently India inaugurated its first 3D-printed post office in Bengaluru.

3D Printing

- **Additive Manufacturing (AM) –** It is the industrial production name for 3D printing.
- It is a process that uses computer-created design to make 3-dimensional objects layer by layer.

- It is an additive process, in which layers of a material like plastic, composites or bio-materials are built up to construct objects that range in shape, size, rigidity and colour.
- It **differs from the traditional subtractive manufacturing** techniques involving cutting large blocks of material to form the desired object.
- The addition of material can happen in multiple ways, namely powder deposition, resin curing and filament fusing.
- The deposition and solidification are controlled by computer to create a 3D object.
- **Potential of India**- India has an excellent opportunity as the world begins to adopt AM techniques.
- Additive manufacturing development and adoption can help India in become a leading manufacturing hub.
- To achieve this, the Ministry of Electronics and Information Technology (MeitY) formulated the 'National Strategy on Additive Manufacturing'.
- The strategy aims to increase India's share in global AM to 5% with a target to add nearly US 1$bn to the GDP by 2025.
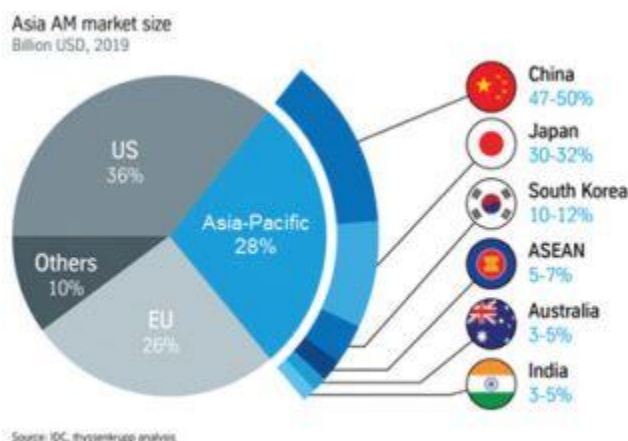

Fig.1 Global Additive Manufacturing Market Distribution[3]

What are the advantages of 3D printing?

- **Simplified Supply Chains**- It is likely to simplify supply chains as semi-fabricated products substitute raw materials and suppliers consolidate.
- **Cost effective**-Procurements and labour costs will decrease.
- This will help Make in India campaign and the Atmanirbhar Bharat Abhiyan as successful.
- **Gross Value Addition Growth**- It can lead to democratisation in innovation by empowering individuals to create and actively participate in the global value chain.

- Many product designs are freely available and individuals can purchase a 3D printer and start manufacturing and selling products.
- **Employment Opportunities**- It is expected to increase productivity which may lead to reduction in employment.
- However, higher productivity and new products create new employment opportunities.
- Workers may need to be provided upskilling opportunities to ensure they remain competent.
- **Sustainable Development**- It would lead to significant reduction in raw material due to
  - o Material-efficient designs
  - o Reduced wastage and
  - o Less need for manufacturing tools, moulds and dies.

- **Energy efficient**- The products will be more energy-efficient. This will help India reduce its carbon footprint and lead to eco-friendly environment.

- **Flexibility-**It allow manufacturers the ease to redesign their products.
- This reduces design constraints and associated costs.
- **Foster innovation**-Flexibility in AM will allow small businesses to innovate and experiment, thus making their products more efficient and enabling product differentiation.

What are the applications of 3D printing?

- **Prosthetics-** It has revolutionized how prosthetics are created. As 3D printing processes and techniques are refined, the creation of custom, tailored prosthetics becomes more straightforward.
- **Replacement Parts-** It has the ability to fabricate replacement parts easily. 3D printing enables consumers and businesses to maximize the value of their purchases.
- **Implants-** It allows the construction of more specialized products for patients.
- Patient outcomes are improved when parts with complex geometries can be fabricated quickly.
- Example- Tooth implants, heart valves, knee replacements etc.,
- **Pharmaceuticals-** 3D-printed drugs to have special delivery profiles that can be tailored to patients' specific needs.
- **Emergency structures-** 3D printing can help alleviate the hardships of affected families by building houses, hospitals, and other structures much faster than by traditional means.
- **Automotive-** Testing and production of lightweight, high strength parts.
- **Electronics-** Production of light weight, impact resistant structures with multiple functionality.

- **Example-** Wearable devices, soft robots etc.,
- **Consumer goods-** Fabrication of complex internal and external structures compels innovative product design.
- **Aerospace**- Relativity Space launched a test rocket made entirely from 3D-printed parts, measuring 100 feet tall and 7.5 feet wide.
- **Healthcare industry**- During Covid-19 pandemic the healthcare industry used 3D printers to make much-needed medical equipment, like swabs, face shields, and masks.

What are the concerns of 3D printing?

- **Scalability-** In conventional techniques, once a design has been set, multiple copies can be made much faster. But 3d printing is slow.
- **High cost-** The initial set up of 3d printing and pre and post processing in healthcare is costly.
- **Job loss-** Due to automation it may have impact on employment opportunities.
- **Limited materials-** Raw materials is not exhaustive in 3d printing, it poses a serious challenge.
- **Skilled labour-** It needs talented individuals to work with additive manufacturing.

What are the initiatives taken to promote 3D printing?

- **Atal Innovation Mission (AIM)-** It is a flagship initiative to create and promote entrepreneurship and innovation across the country.
- **Atal Tinkering Labs -** It is launched under AIM which aims to foster creativity and innovation in young minds.
- It focuses on Science, Technology, Engineering and Math (STEM) concepts.
- Dedicated workspaces have been set up with do-it-yourself (DIY) kits including 3D printers, robotics and miniaturised electronics are installed.
- **National Strategy on Additive Manufacturing**- The strategy aims to increase India's share in global AM to 5% with a target to add nearly US 1$bn to the GDP by 2025.

What lies ahead?

- **Private Partnership Model-** Establish National Additive Manufacturing Centre as a dedicated agency to promote the adoption of AM technologies.
- **Strengthening Technology Leadership-**There is a need to address the skilled workforce.
- **Research-** There is a need to promote Research and Development in AM, encourage competition, and create a next generation workforce.
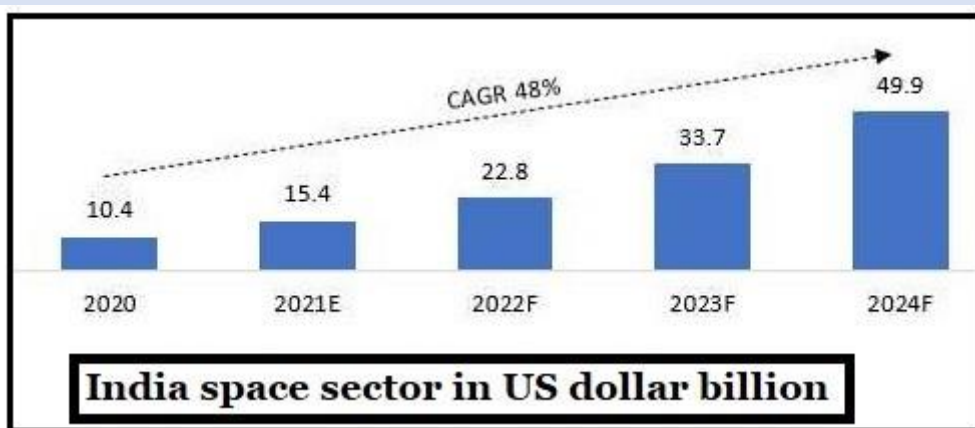
- **Supply Chain Development**- The government can provide incentives to small businesses aligned with the AM Technology Advancement Plan and include AM in various schemes and incentives.

31. Privatisation of Space Sector

IIT-Madras based space tech startup, Agnikul Cosmos, will soon launch its small satellite rocket, Agnibaan SOrTeD (SubOrbital Technological Demonstrator).

Status of India in Global Space Market
- As per SpaceTech Analytics, in 2021, India is the 6th largest player in the industry internationally having 3.6% of the world's space-tech companies.   - U.S. leads the list housing 56.4% of all companies in the space-tech ecosystem.   **Value** - The Indian Space Industry was valued at **7 billion dollars** in 2019 and aspires to grow to 50 billion dollars by 2024.   **Cost effective** - The country's standout feature is its cost-effectiveness.   - India holds the distinction of being the first country to have reached the Mars' orbit in its first attempt.   - The total cost for Mangalyaan mission is 75 million dollars which is way cheaper than Western standards.

India space sector in US dollar billion

CAGR 48%

2020	2021E	2022F	2023F	2024F
10.4	15.4	22.8	33.7	49.9

What is the need for Privatisation?

- The global space economy is currently valued at about USD 360 billion.
- Despite being one among a few spacefaring nations in the world, India accounts for only about 2% of the space economy.
- Over the last 2 decades, the private sector has played an increasingly important role in other spacefaring countries.
- **Examples** - SpaceX, Blue Origin, Virgin Galactic, and Arianespace.
- In India, players within the private space industry have been limited to being vendors or suppliers to the government's space program.

- Thus, a need arises for Non-Governmental Entities (NGEs) to participate in Indian space programme and boost India's market share in Global Space Economy.

Indian space contribution
2% of global market share

% of global market share

US	40%
UK	7%
India	2%

Global space economy (in 2021)	USD 386B
India (in 2021)	USD 7.6B

Agnibaan
• **About -** It is a **2-stage** launch vehicle that is capable of taking payloads of up to **100 kilograms** to a low-earth orbit around 700 kilometres from the surface of the Earth. • **Engine -** The Agnibaan rocket will be powered by the company's 3D-printed **Agnilet engines**. • **Agnilet Rocket -** It is entirely 3D-printed, single-piece, 6 kN semi-cryogenic engine. • **Propellant -** A mixture of liquid kerosene at room temperature and super cold liquid oxygen to propel itself. • Agnikul successfully test-fired the Agnilet engine at ISRO's facility in Thiruvananthapuram.

What are the advantages of privatisation?

- **Reduces ISRO's burden** - Private participation will free up ISRO to concentrate on science, research and development, interplanetary exploration, and strategic launches.
- **Commercialisation**- Globally, private players in space are increasing due to commercial benefits.
- **Increase investment**- Due to revised Foreign Direct Investment, it would foster improved technology and efficiency.

- Cost Competitive - Promoting the private sector will enable the India to remain cost competitive within the global space market.
- **Job creation** - This would tap the potential of young entrepreneurs and create more employment opportunities.
- **Indigenization** - Indian Space Association supports the government's vision of 'Atmanirbhar India' (self-reliant India) and 'Make in India' to become a leader in the global space industry.
- **Infrastructure** - Agnikul cosmos launched India's first private launch pad and mission control centre at the Satish Dhawan Space Centre in Sriharikota.
- **Global leader**- Privatisation would make India a global leader in space sector.

What are the steps taken by India to support private sector in space?

Indian Space Research Organisation formed in 1969. It is under Department of Space overseen directly by the Prime Minister of India

- **Demand based Model** - In order to enhance utilization and maximize benefits from the space assets, it is proposed to change the approach from Supply Based Model to Demand Based Model.
- NewSpace India Limited (NSIL) will act as the aggregator of user requirements and obtain commitments.
- **NSIL-**New Space India Limited launched in **2019** as a wholly owned Government of India Undertaking under the administrative control of Department of Space (DOS).
- It will help in transferring technologies developed by ISRO to industries for commercialisation
- **IN-SPACe-**Indian National Space Promotion and Authorisation Centre is an autonomous body established in 2020 under the Department of Space.
- It aims to create an eco-system of industry, academia and start-ups and to attract major share in the global space economy.
- **Indian Space Association-** It was launched in 2021, to help private players carry out independent space activities, facilitate services and technology developed by ISRO to be utilised in the private sector.
- **Revised FDI guidelines-** This would open up huge investment opportunities for the foreign companies.
- FDI in space sector is allowed up to 100% in the area of Satellites-Establishment and Operations through Government route.
- **Atal Tinkering Labs-** To boost participation of young people and students in the Indian space sector.
- It is an initiative of NITI Aayog, in collaboration with ISRO and the Central Board of Secondary Education (CBSE) as part of the Atal Innovation Mission.

- **Indian Space Policy 2023** - The policy formally laid down the regulations of privatizing space missions in India, and also denoted clear guidelines of operations for NewSpace India Limited (NSIL), ISRO's commercial arm ANTRIX and Indian National Space Promotion and Authorization Centre (IN-SPACe).

What lies ahead?

- Optimal utilisation of space technology will revolutionise the delivery of governance services and enhance developmental efforts.
- The Indian space sector can potentially inspire the young populace with scientific curiosity and encourage them to pursue a career in STEM.
- Indian space sector has an opportunity to create a vibrant ecosystem for start-ups and private enterprises.
- Being one of the few spacefaring countries, India is increasingly encouraging private sector participation through various reforms that are expected to help India achieve a market share of more than 10% in the global space sector by 2030.

32. The Problem with Battery Electric Vehicles

Battery Electric Vehicles (EVs) are seen as push for net zero but there are some challenges with respect to Indian scenario.

Battery Electric Vehicles

- An EV is a vehicle that uses one or more electric motors for propulsion.
- They are either partially or fully powered on electric power.
- While some EVs used lead acid or nickel metal hydride batteries, the standard for modern battery electric vehicles is now considered to be lithium ion batteries.

Types of EVs

- Battery electric vehicles (BEVs)
- Plug-in hybrid electric vehicles (PHEVs)
- Hybrid electric vehicles (HEVs)
- Fuel cell electric vehicles (FCEVs)

FOUR TYPES OF EVs

HEVs: Conventional hybrid electric vehicles (such as variants of the Toyota Hyryder Hybrid or Honda City e:HEV in India) combine a conventional ICE system with an electric propulsion system, resulting in a hybrid drivetrain that substantially lowers fuel usage. The onboard battery in a conventional hybrid is charged when the IC engine is powering the drivetrain.

PHEVs: Plug-in hybrid vehicles (such as the Chevrolet Volt) also have a hybrid drivetrain that uses both an ICE and electric power for motive power, backed by rechargeable batteries that can be, in this case, plugged into a power source.

BEVs: Vehicles like the Tata Nexon in India, or the Nissan Leaf and Tesla Model S, have no ICE or fuel tank, and run on a fully electric drivetrain powered by rechargeable batteries.

FCVs: Fuel cell vehicles (such as Toyota's Mirai and Honda's Clarity) use hydrogen to power an onboard electric motor. FCVs combine hydrogen and oxygen to produce electricity, which runs the motor, and the only residue of the chemical process is water. Since they're powered entirely by electricity, FCVs are considered EVs — but unlike BEVs, their range and refuelling processes are comparable to conventional cars and trucks.

What is the significance of EVs?

- **Lower running costs-** The running cost of an electric vehicle is much lower than an equivalent petrol or diesel vehicle.
- **Eco-Friendly-** Neither gas nor fossil is used to power the engine.
- Hence, it will help India achieve net zero by 2070.
- Noise pollution is comparatively less than conventional vehicles.
- **Low maintenance cost-** They have very low maintenance costs as they don't have as many moving parts as an internal combustion vehicle.
- The servicing requirements for electric vehicles are also lesser.
- **Zero Tailpipe Emissions-** Driving an electric vehicle can help you reduce your carbon footprint because there will be zero tailpipe emissions.
- **Tax and financial benefits-** Government offers many incentives for purchase of EVs like free toll roads, free parking lots etc.,

What are the steps taken by the government to promote EV?

- **National Electric Mobility Mission Plan (NEMMP) 2020-** It aims to achieve national fuel security by promoting hybrid and electric vehicles in the country.
- There is an ambitious target to achieve 6-7 million sales of hybrid and electric vehicles year on year from 2020 onwards.

- **GST-** Goods and Services Tax on the electric vehicles and the chargers/ charging stations has been reduced from 12% to 5% and from 18% to 5%, respectively.
- **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme-** Launched in 2015, it aims to promote electric mobility through financial incentives for enhancing electric transportation infrastructure.
- **FAME 2 –** It is launched in 2019 with an outlay of 10,000 crores to incentivize demand for Electric Vehicles (EVs) by providing upfront subsidies and creating EV charging infrastructure.

What are the issues regarding EVs?

- **High Subsidy-** The tax breaks for cars, results in tax burden for middle or upper middle classes, who are typically the buyers of battery electric four-wheelers.
- **Infrastructure Deficit-** In India, the number of EVs had crossed 1 million by mid-2022, but only about 2,000 public charging stations are currently operational across the country.
- **Non-Renewable Electricity Source-** In India, the power source for grid is largely fed by coal-fired thermal plants resulting in GHG emissions.
- **Increased dependency of import-** Since India requires 50,000 tonnes of lithium to manufacture EV batteries alone, it would ultimately depend on imports.

More than 90% of the global Li production is concentrated in Chile, Argentina, Bolivia, Australia and China. Lithium Triangle Countries - Argentina, Bolivia, Chile

- **EV Firing Incidents-** EV fires is caused due to thermal runaway that results in short circuit by malfunctioning of batteries.

What other technologies are available?

- **Hybrid technology-** It has improved fuel efficiency and does not require the charging infrastructure base.
- **Flex Fuel-** A flex fuel or flexible fuel vehicle has an internal combustion engine which can run on more than one type of fuel, or even a mixture of fuels such as petrol and ethanol.
- **FCEVs & Hydrogen ice -** Hydrogen fuel cell electric vehicles (FCEVs) are practically zero emission.
- In this, Hydrogen is pressurised and stored in a cryogenic tank, from there it is fed to a lower-pressure cell and put through an electro-chemical reaction to generate electricity.

- **Hydrogen Internal combustion Engine (ICE)-** It is similar to conventional internal combustion engine vehicles.
- The fuel delivery system and spark plugs are modified to enable compatibility with hydrogen.
- **Synthetic Fuel-** This idea is to make it usable in all petrol-engine cars, which results in CO2-neutral.

What lies ahead?

- **Improve Public charging infrastructure-** The successive faster adoption of EVs in Norway and China is due to sustained efforts of increasing public charging infrastructure.
- **Increase investment-** Reduce the overt subsidies given to purchase of EVs instead invest in R&D to improve the efficiency and efficacy of EVs.
- There is a need to customise it to the needs of Indian environment to reduce firing incidents of EVs.
- **Enhance value chain-** Reduce dependency of raw materials, look for other viable options.

33. The Horticulture Sector of India

Though the production and productivity of fruits and vegetables quadrupled during the last three decades, the same has not been translated into comparable increases in the incomes of the cultivators.

What is horticulture?

- Horticulture is an important branch of agriculture that deals with the cultivation of plants and vegetables for food, medicine, and other uses.

Terms	Meaning
Pomology	It deals with cultivation of fruit and nut crops
Olericulture	It deals with cultivation of herbaceous plants for the kitchen
Floriculture	It deals with production of flowers and ornamental plants

What is the status of horticulture sector in India?

- **Production** - In 2022, total Horticulture produce is **341.6 million tonnes** and total Agriculture produce is **314.5 million tonnes.**
- Fruits and vegetables account alone account for almost 90% of the total horticulture production in the country.

- According to FAO 2021, India leads in the production of certain vegetables (ginger and okra) and fruits (banana, mangoes and papaya).
- **Areas of cultivation of flowers** - More than 50% of the floriculture products are produced in Karnataka, Andhra Pradesh and Tamil Nadu and Madhya Pradesh.
- **Areas of cultivation of fruits & vegetables** - Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal, Uttar Pradesh, and Odisha.
- **Contribution** - Horticulture contributes **30.4%** of the agriculture Gross Domestic Product (GDP) using only 13.1% of gross cropped area.
- **Exports** - India is ranked **14th** in vegetables and **23rd** in fruits.
- However, the global horticulture market of India is at mere **1%.**

What is the significance of horticulture sector?

- Plays crucial role in providing food and nutritional security especially to rural and tribal population
- Promotes to diversify the income of the farmers and aid in doubling their income
- Acts as an important source of raw material for food processing industries, leading to the creation of value added products
- Helps in the development of the rural economy by generating income and employment
- Acts as an important source of foreign exchange for India through exports

What are the issues faced by horticulture sector?

- **Production challenges-** It is caused by small operational landholdings, lack of irrigation and poor soil management.
- **Limited land availability-** It affects crop rotation and the use of sustainable agricultural practices is also impacted.
- **Lack of Irrigation**- It is due to insufficient access to water for irrigation.
- **Poor soil management practices** - Over-tilling, over-fertilising, and mono cropping will reduce soil fertility leading to low yields and low-quality produce.
- **Lack of institutional credit**- Lack of access to institutional credit for small and marginal farmers results in low investments.
- There is a limited outreach of farm insurance and farm mechanisation.
- **Climate change**- Changing weather patterns, droughts, floods, and other natural disasters leads to crop failures and losses.
- **Others -** Poor logistics and weak Farmer Producer Organisations are the other issues.

Around 15-20 % of the fruits and vegetables in India are wasted along the supply chain or at consumer level.

What steps were taken to promote horticulture sector?

- **Mission for Integrated Development of Horticulture (MIDH) -** It is a Centrally Sponsored scheme launched in 2014-15.
- The 5 sub-schemes under this mission are
    o **National Horticulture Mission-** It is implemented by State Horticulture Missions in selected districts of 18 States and 6 Union Territories.
    o **Horticulture Mission for North-East and Himalayan States (HMNEH)-** It is implemented by State Horticulture Missions in the North Eastern and Himalayan States.
    o **National Horticulture Board-** It has a goal to improve the integrated development of Horticulture industry. (Headquarters-Gurugram, Haryana)
    o **Coconut Development Board-** It is implemented in all coconut growing States with the focus of productivity increase and product diversification. (Headquarters- Cochin, Kerala)
    o **Central Institute of Horticulture-** It provides adequate institutional support to development of horticulture in North-East region. (Headquarters-Medziphema, Nagaland)
- **Agriculture Infrastructure Fund-** It was launched in 2020 for creating community farming assets and integrated post-harvest management infrastructure.
- **Horticulture Cluster Development Programme**- It is a central sector program implemented by National horticulture Board.

How to address the challenges in the horticulture sector?

- **Investment in agri-infrastructure**- There is a need to capitalise in MIDH and Operation Greens, horticulture produce can reach the airport cargo handling facility and improve the export.

Operation Greens, launched in 2018 by the Ministry of Food Processing Industries, is a price fixation scheme to ensure farmers are given the right price for their produce. It has been implemented for the development of Tomato, Onion and Potato (TOP) value chain.

- **Focus on food processing-** This can be done by leveraging the One District One Product model, food processing of fruits and vegetables may be encouraged in order to expand the export basket.

- **Renaissance of co-operatives**-To harness market efficiency and boost exports, co-operatives in horticulture should be promoted.
  - o For example, In Karnataka, HOPCOMS supplies inputs to farmers at reasonable prices and collects the horticultural produce directly from them.
- **Compliance with international standards -** Horticultural producers have to comply with world-class quality norms (Codex standards) apart from timely execution of export orders to avoid rejection from buyers.
  - o Japan and the US banned import of mangoes and other fruits from India due to prevalence of fruit-fly pest infestation.

The Codex Alimentarius or "Food Code" is a collection of standards, guidelines and codes of practice adopted by the Codex Alimentarius Commission.

- **Digitalisation -** Climate-smart technologies, biotechnology, and nano technology should be promoted to boost exports.
- **Channelize Corporate Social Responsibility (CSR) grants**-CSR grants may be channelled to undertake advanced research for digitalisation of horticulture through artificial intelligence, machine learning, and Internet of Things.
- **Institutional support-** Institutes like National Horticultural Board, Agricultural and Processed Food Products Development Authority, and NABARD need to provide liberal financial assistance for undertaking extension services in horticulture.
- **Training-** Exporters should be imparted training on good agricultural practices and in commodity derivatives to protect them against price volatility and exchange rate risks.

34. Ecological Significance of Northeast India

A recent case involving Umiam Lake in Meghalaya highlights the delicate balance between economic growth and ecological preservation in Northeast India.

Umiam Lake and the Environment

- **PIL on Cleanliness:** The Meghalaya High Court heard a PIL concerning Umiam Lake's cleanliness, emphasizing the need to protect natural beauty amid development.

- **Guidelines Insufficiency:** The court noted that the Meghalaya Waterbodies Guidelines did not address the pressing issue of unchecked construction around waterbodies.

Ecological Significance of North East

- **Biodiverse Region:** Northeast India boasts abundant natural resources, including oil, gas, minerals, and fresh water. It features vital biodiversity hotspots like the Garo-Khasi-Jaintia hills and the Brahmaputra valley.
- **Environmental Challenges:** Despite being industrially underdeveloped, deforestation, floods, and existing industries threaten the region's fragile ecosystem.

Legal Framework for Environmental Protection

- **Environmental Laws:** India has formulated several environmental laws, particularly in the 1980s. Offences against the environment are treated as "public nuisance" under sections of the Indian Penal Code.
- **District Council Autonomy:** The Sixth Schedule of the Constitution grants District Councils autonomy, limiting state authority over matters like land use. This lack of regulation impacts land preservation around water bodies.

Role of PILs and Judicial Activism

- **Environmental Litigation:** PILs and judicial activism under Articles 32 and 226 have led to impactful environmental litigation, imposing penalties and guidelines.
- **National Green Tribunal:** The National Green Tribunal imposed heavy fines on states like Meghalaya and Manipur for illegal mining and improper waste management.

Sustainable Development and Ecology

- **Negative List in NEIDS:** The North East Industrial Development Scheme (NEIDS) incorporates a "Negative List," excluding entities without compliance with environmental standards from incentives.
- **Holistic Policy Approach:** The "Act Fast for Northeast" policy should encompass both trade and commerce and the preservation of the environment to achieve balanced development.
- **Need for Comprehensive Legislation:** A uniform and comprehensive environmental legislation that addresses environmental concerns at all levels of governance is crucial.

Conclusion

- The delicate balance between development and environmental preservation is crucial for Northeast India's future.
- Sustainable policies, strict enforcement of guidelines, and holistic development approaches are vital to ensure the region's rich ecology thrives alongside economic growth.

5. On protecting the biodiversity of the northeast

Background

- In the recent case of Cleanliness of Umiam Lake vs. State of Meghalaya (2023), the division Bench of the Chief Justice held that "the natural beauty of the State should not be destroyed in the absence of any other employment opportunities and in the name of promoting tourism."
- The Meghalaya High Court was deliberating on a Public Interest Litigation (PIL) over the cleanliness of Umiam Lake.
- The Meghalaya Water Bodies (Preservation and Conservation) Guidelines, 2023, were criticized by the court for failing to address the "most serious aspect of buildings and construction mushrooming around water bodies."

Vulnerable Biodiversity of Northeast India

- Northeast India is a green belt region due to its immense natural resources such as oil, natural gas, minerals, and freshwater.
- Some of the most significant biodiversity hotspots include the Garo-Khasi-Jaintia highlands and the Brahmaputra river.
- Despite the northeast's economic backwardness, deforestation, floods, and existing industries are wreaking havoc on the region's ecology.
- According to the Ministry of Development of the North-eastern Region's environmental assessment of the North East Rural Livelihood Project, "Northeast India lies within an ecologically fragile, biologically rich region, highly prone to climatic changes, located in trans boundary river basins." Deforestation, mining, quarrying, and shifting farming are all threatening the regions' biodiversity and fauna.

Environmental Laws and Government role

- Environmental offences have been classified as "public nuisance" in the Indian Penal Code (IPC), 1860.
- The Sixth Schedule of the Constitution restricts the State's power over issues falling under the District Councils' purview, notably the use of property, by granting the District Councils autonomy. In many cases, District Councils do

not impose any restrictions for the preservation and conservation of land, particularly surrounding bodies of water.

- Environmental litigation erupted as a result of PILs and judicial activism fostered by Articles 32 and 226 of the Constitution.
- The implementation of rigorous restrictions and the application of harsh fines by judicial and quasi-judicial authorities of the state frequently saves these regions' ecologically delicate flora and wildlife.
- The North East Industrial Development Scheme (NEIDS), 2017's 'Negative List' is a step in the right direction. If an entity does not meet environmental criteria, it will not be eligible for any NEIDS incentives and will be placed on the "negative list."
- Similarly, the 'Act Fast for Northeast' strategy should cover not only "trade and commerce" but also "environment and ecology" preservation in the region.

Conclusion

Central and state governments must improve infrastructure, generate money, and create jobs through long-term policy. Aiming for a 10-trillion-dollar economy while failing to safeguard India's ecology is a futile objective. The government should investigate the possibility of developing consistent environmental law that addresses environmental challenges at all levels of government.

35. Amitabh Kant Committee

Amitabh Kant committee was constituted in 2023 to examine stalled real estate projects and to recommend ways to complete the stalled projects.

Amitabh Kant Committee
Set up by - Ministry of Housing and Urban Affairs   **Year of formation** - 2023   **Members**   - Ministry of Finance   - Uttar Pradesh State government   - Haryana State government   - Insolvency and Bankruptcy Board of India   - National Housing Bank   - Real Estate Regulatory Authority (RERA) of Haryana and UP   **Tenure**- Need to submit its report in 6 months

What are the key findings of the report?

Indian Banks Association (IBA) has said that 60% of the stalled projects had already been bought, with a capital commitment of Rs.1.9 lakh crore.

- **Findings-** The committee was formed to find quantitative analysis (how many) and to find the location of legacy stalled projects.
- It cited the IBA's estimation that
    - 4.12 lakh dwelling units of Rs.4.08 lakh crore were stressed
    - About 2.40 lakh (44%) of these were in the National Capital Region
    - Another 21% of the units were in the Mumbai Metropolitan Region
- **Reason for stress-** Lack of financial viability

What are the recommendations of the committee?

- **Mandatory registration**- All projects with the following criteria must be registered with State Real Estate Regulatory Authority (RERA).
    - Where the land is over 500 square metres or
    - The number of apartments to be constructed are more than 8
- **De-link registration-** The committee advocated to de-link the grant of registration or sub-lease by the land authorities to the homebuyers from the recovery of dues from developers.
- This would benefit about 1 lakh homebuyers for the immediate registration and execution of subleases in favour of homebuyers.
- **Granting certificates-** RERAs should identify projects where no-objection and completion certificates have not been issued.
- It should accelerate the process to grant certificates, irrespective of the developers paying their dues to the authorities.
- **Rehabilitation package-** It is the role of the State governments to set up a rehabilitation package to get the stalled projects run again.
- **Conditions**
    - The developers should commit to complete the projects in 3 years.
    - It includes Zero Period for 2 years starting with the onset of COVID pandemic.
    - Developers would be allowed to get a co-developer on board to complete the work.
- **Partial surrender policy**- The developers can give back some of the unused lands to the authority in exchange for a waiver on the dues for that land.
- **Outstanding payments**- The RERA can directly collect these outstanding payments from homebuyers, bypassing the builders.
- **Occupancy-** It suggests that occupancy or possession of substantially completed projects should be granted within the next 30 days.
- **Financial support-**
    - Bring stalled projects under the purview of priority sector financing.
    - Ministry of Housing and Urban Affairs should formulate a scheme.

- o The government should consider offering subsidized interest rates or a guarantee scheme similar to those available in the MSME sector.
  - o Improve the Internal Rate of Return of the projects in order to attract funding.
- **Last resort**- Judicial interventions, like the use of the Insolvency and Bankruptcy Code, should be the last resort.
- **Project viability**- All the stakeholders (developers, financiers, land authorities etc.,) would have to take a haircut or accept less than what is due to them.

Who will implement the recommendations?

Real estate is a state subject under 7th schedule, hence it falls under the purview of respective state governments.

- **Model package**- Uttar Pradesh, Noida and Greater Noida have already moved towards implementing the model package envisaged in the report.
- **SWAMIH fund-** The committee asked the Ministry of Housing and Urban Affairs to prepare a detailed scheme for using the Special Window for Affordable and Mid-Income Housing (SWAMIH) Fund.
- It should be used to finance the stalled projects and sent it to the Finance Ministry.
- It also asked MoHUA to send a detailed proposal to the Finance Ministry on permitting banks to finance fresh housing loans for new buyers of the unsold inventory of the stalled project.

Quick facts

Real Estate Regulatory Authority Act ,2016
Aim- To protect the interests of homebuyers & boost investment in the real estate sector.   - To bring transparency & efficiency in sale/purchase of real estate by establishing RERA in each state to regulate real estate sector.   **Establishment of bodies**   - o Regulatory Authorities   - o Adjudicating Officers and Appellate Tribunals   **Registration of Real Estate Agents-** All agents dealing in real estate projects need to register with respective State RERAs.   **Separate Bank Account for each project**- 70% of the amount collected from homebuyers for a project must be maintained in a separate bank account.   - It should be used only for construction of that project and land cost.   **Online Information -** Through the online portal, the homebuyers are

empowered to take the informed decision to buy their dream homes as well.

- **Penal Provisions-** It provides strict penal provisions of imprisonment in addition to provisions for refund, interest and penalty in case of non-compliance by developers, allottees and agent.

36. India's Path towards One Health Approach

- The global spotlight on the 'One Health' concept is illuminating India's strides in integrating this paradigm to enhance its response to health challenges.
- While gaining recent recognition, the One Health approach finds its roots in history.

One Health Approach

- **Holistic Vision:** The One Health approach acknowledges the intricate linkages between the health of humans, animals, plants, and their shared environment.
- **Historical Foundation:** Early traces of One Health can be found in the teachings of Hippocrates and later articulated by 19th-century physician Rudolf Virchow, emphasizing unity in animal and human medicines.

Addressing Modern Health Challenges

- **Environmental Impacts:** Human growth, urbanization, and industrialization contribute to biodiversity and ecosystem disruption, fostering zoonotic diseases.
- **Zoonotic Diseases:** Roughly 60% of emerging diseases that affect humans are zoonotic, including Ebola, bird flu, and rabies.
- **Key Concerns:** The rise of antimicrobial resistance, vector-borne diseases, and food safety underscores the need for an integrated approach.

Power of One Health Strategy

- **Resource Efficiency:** One Health fosters coordination across governmental units, reducing resource demands and promoting cross-sectoral collaborations.

- **Economic Benefits:** One Health proves economically prudent, potentially saving billions when compared to pandemic management through non-One-Health strategies.

Recent One Health Endeavors in India

- **COVID-19 Impact:** The COVID-19 pandemic underscored the importance of the One Health approach.
- **Indian Initiatives:** India established a 'Standing Committee on Zoonoses' in 2006 and launched the 'National One Health Mission' for coordinated efforts.

The Transformation Process: Four Stages

- **Stage 1: Communication:** Setting up mechanisms for inter-ministerial communication and stakeholder engagement.
- **Stage 2: Collaboration:** Exchange of knowledge and expertise, defining roles in zoonoses management.
- **Stage 3: Coordination:** Long-term routine activities led by a dedicated agency for seamless collaboration.
- **Stage 4: Integration:** Developing synergies between sectors for streamlined resource sharing and coordinated initiatives.

Facilitating Collaborative Science

- **Integrated Research:** Beyond office-sharing, integrated research environments are crucial, allowing access to laboratories and biological samples.
- **Sample Utilization:** Efficient use of expensive and ethical biological samples, such as blood and tissue, enhances collaborative research outcomes.

Conclusion

- India's embrace of the One Health approach reflects its commitment to holistic well-being.
- By recognizing the interconnectedness of humans, animals, plants, and the environment, India is laying the groundwork for comprehensive health strategies.
- With ongoing initiatives and a vision to seamlessly integrate resources and expertise, India aims to transform its health landscape, ensuring resilience against emerging challenges through a united and holistic approach.

37. Brief History of ISRO

Chandrayaan 3's successful landing in Moon makes India the first country to reach close to lunar South Pole of the Moon, thus sparking the history of ISRO's space voyage.

How did ISRO evolve?

Dr.Vikram Sarabhai is known as father of Indian space programme.

- Indian Space Research Organisation (ISRO) is the space agency of India.
- **Role-** It is involved in science, engineering and technology to harvest the benefits of outer space for India and the mankind.
- **Formation -** It was formed on August 15, 1969 and superseded Indian National Committee for Space Research (INCOSPAR), set up in 1962 by Dr. Vikram Sarabhai with an expanded role to harness space technology.
- Department of Space (DoS) was set up and ISRO was brought under DoS in 1972.
- **Objective-** Development and application of space technology for various national needs.
- **Space system**- ISRO has established major space systems for
  - o Communication, television broadcasting and meteorological services
  - o Resources monitoring and management;
  - o Space-based navigation services.

Specification	Location
Headquarters of ISRO	Bengaluru, Karnataka
Launch Vehicles	Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram
Satellites	U R Rao Satellite Centre (URSC), Bengaluru
Integration and launching of satellites and launch vehicles	Satish Dhawan Space Centre (SDSC), Sriharikota
Development of liquid stages including cryogenic stage	Liquid Propulsion Systems Centre at Valiamala and Bengaluru
Sensors for Communication and Remote Sensing satellites	Space Applications Centre (SAC), Ahmedabad
Remote Sensing satellite data reception processing and dissemination	National Remote Sensing Centre (NRSC), Hyderabad

What about ISRO's Satellite Program?

- **Aryabhata-** Launched in 1975, it marked India's entry into the space era and became the forerunner of our space programme.

Satellite Type	Applications	Examples
Communication Satellites	Provide services to telecommunications, television broadcasting, satellite newsgathering, societal applications, weather forecasting, disaster warning and Search and Rescue operations.	The Indian National Satellite (INSAT) series GSAT series, KALPANA-1
Earth Observation Satellites	Agriculture, water resources, urban planning, rural development, mineral prospecting, environment, forestry, ocean resources and disaster management.	Indian Remote Sensing (IRS) series, RESOURCESAT-1, 2, 2A, CARTOSAT-1, 2, 2A, 2B, RISAT-1 and 2, OCEANSAT-2,
Navigation Satellites	Used to meet the emerging demand of positioning, navigation and timing and also civil aviation requirements.	GAGAN and IRNSS (NAVIC)

What are the ISRO's launch vehicle programs?

- They are used to carry spacecraft to space. India has three active operational launch vehicles-
    o Polar Satellite Launch Vehicle (PSLV)
    o Geosynchronous Satellite Launch Vehicle (GSLV),
    o Geosynchronous Satellite Launch Vehicle Mk-III (LVM3)
- **PSLV**- It is considered as Work horse of ISRO. It has been a versatile launch vehicle deployed for launching all 3 types of payloads - Earth Observation, Geo-stationary and Navigation.
- It marked India's entry into the Big Rockets league, as it could carry a payload of up to 1,000 kg.
    o Example- Chandrayaan 1 and Mangalyaan were launched by PSLV.
- **Configuration of PSLV-**
    o **Generic PSLV** - Six strap-ons,
    o **PSLV-CA**-the core alone configuration with no strap-ons
    o **PSLV-XL-** The most powerful one with extended strap-ons
- **GSLV**- It aimed to solve two of the biggest limitations of PSLV
    o It can deliver a payload of about 1,750 kg to a lower Earth orbit, up to an altitude of 600 km from the Earth's surface

o It can go a few 100 kilometres higher in Geostationary Transfer Orbit (GTO), though only with a reduced payload.

- **LVM3-** It is the next generation launch vehicle. And the heaviest launch vehicle.
  o The rocket can put a 4,000 kg payload into geostationary orbits that are over 30,000 km from Earth.
  o GSAT-19 satellite is LVM-3's 1st successful mission launched in 2017.
- **HRLV-** The Human rated LVM3 is identified as the launch vehicle for Gaganyaan mission, which is named as HRLV.
- **Small Satellite Launch Vehicle (SSLV)-** It is being developed with complete indigenous technologies to meet the small satellite launch market on demand driven basis.

Historic Launchers	Operational Launchers	Future Launchers
• Satellite Launch Vehicle (SLV – 3) • Augmented Satellite Launch Vehicle (ASLV)	• Polar Satellite Launch Vehicle (PSLV) • Geosynchronous Satellite Launch Vehicle (GSLV) • Sounding Rockets • Small Satellite Launch Vehicle	• Reusable Launch Vehicle – Technology Demonstrator (RLV-TD)

What about the planetary explorations of ISRO?

- **Mangalyaan-** It is the maiden interplanetary mission of the ISRO to explore and observe Mars surface features, morphology, mineralogy and the Martian atmosphere.
- Launched in 2013, the probe was successfully inserted into Martian orbit on September 24, 2014 in its first attempt.
- The mission was a "technology demonstrator" project to develop the technologies for designing, planning, managing, and operations of an interplanetary mission.
- Mangalyaan concluded its journey in 2022.

ISRO was the 4th agency to reach the Mars orbit after Russia's Roscosmos, NASA, and ESA.

- **Moon exploration-**
  o **Chandrayaan-1** - Chandrayaan-1's orbiter detected the evidence of water on the Moon. It was launched on 2008.

- o **Chandrayaan-2-** It is India's first lander mission, it was launched in 2019.
- o **Chandrayaan-3-** The success of the mission is not only a major step forward for India's lunar programme but also showcases its capabilities and scientific advancement. It was launched in 2023

India becomes 1st country to land on Moon's South Pole and 4th country (after Russia, the U.S. and China) to land on the Moon.

38. Sodium Ion Battery Innovation

- Coimbatore-based start-up AR4 Tech has joined hands with Singapore's Sodion Energy to revolutionize the energy storage landscape by producing sodium-ion battery packs for both local and global markets.
- These sodium-ion batteries will find applications in converting conventional petroleum-based vehicles, primarily two-wheelers, into electric vehicles.

Sodium Ion Battery (NIB)

- A NIB is a type of rechargeable battery that uses sodium ions as the charge carriers to store and release electrical energy.
- Similar in principle to lithium-ion batteries, sodium-ion batteries offer an alternative energy storage solution with potential benefits such as cost-effectiveness and abundance of sodium resources.

Key characteristics

- **Working Principle:** Sodium-ion batteries operate on the same basic principle as lithium-ion batteries. During charging, sodium ions are moved from the positive electrode (cathode) to the negative electrode (anode), and during discharge, they move back to the cathode, generating electrical energy in the process.
- **Sodium Anode:** In a sodium-ion battery, the anode typically consists of materials that can intercalate (absorb) sodium ions during charging. Graphite and other carbon-based materials are commonly used for the anode in sodium-ion batteries.
- **Cathode Materials:** Various materials can be used as cathodes in sodium-ion batteries, such as transition metal oxides or polyanionic compounds. These cathode materials allow sodium ions to be stored and released, enabling the battery's energy storage function.

- **Electrolyte:** The electrolyte in a sodium-ion battery is responsible for facilitating the movement of sodium ions between the anode and cathode during charge and discharge cycles. Sodium-ion batteries typically use a solid electrolyte or a liquid electrolyte containing sodium salts.

Advantages offered

- **Abundance of Resources:** Sodium is more abundant and widely available than lithium, which can potentially make sodium-ion batteries more cost-effective.
- **Environmental Impact:** They may have a lower environmental impact compared to lithium-ion batteries due to the more widespread availability of sodium resources.

Challenges

- **Energy Density:** Sodium-ion batteries generally have lower energy density compared to lithium-ion batteries, which can limit their use in applications requiring high energy storage capacity.
- **Cycle Life:** Ensuring a long cycle life (the number of charge and discharge cycles a battery can go through before losing capacity) remains a challenge for sodium-ion batteries.

39. International Atomic Energy Agency (IAEA)

- Japan has begun discharging treated radioactive wastewater from the disabled Fukushima Daiichi Nuclear Power Station into the Pacific Ocean in a plan endorsed by the International Atomic Energy Agency (IAEA).

International Atomic Energy Agency (IAEA)

- IAEA is an international organization that plays a pivotal role in promoting the peaceful use of nuclear energy while preventing the proliferation of nuclear weapons.
- It was established in 1957 as an autonomous agency under the UN is headquartered in Vienna, Austria.
- It plays a crucial role in safeguarding the principles outlined in the Nuclear Non-Proliferation Treaty (NPT) of 1970.
- Despite its independent treaty, the IAEA remains accountable to both the UN General Assembly and the United Nations Security Council (UNSC).

What does it do?

- **Promotion of Peaceful Nuclear Energy:** Established amidst the Cold War's geopolitical tension, the IAEA's core mission centers on promoting the constructive application of nuclear energy.
- **Prevention of Military Use:** The agency's fundamental role is to prevent the diversion of nuclear programs for military intentions, ensuring compliance with international agreements.

IAEA's Tri-fold Missions

- **Peaceful Utilization:** Fostering member states' constructive adoption of nuclear energy for peaceful purposes constitutes a pivotal aspect of IAEA's mission.
- **Safeguarding Measures:** A cornerstone role of the IAEA involves implementing measures to verify the non-military use of nuclear energy, particularly through assessing declared nuclear activities and materials.
- **Nuclear Safety:** The IAEA takes an active stance in advocating stringent standards of nuclear safety to prevent accidents and ensure public and environmental protection.

Significant feature: IAEA's Safeguards

- **Purpose of Safeguards:** IAEA's safeguards are mechanisms designed to affirm that a nation adheres to its international commitment against exploiting nuclear programs for weaponry purposes.
- **Verification Approach:** Safeguards are founded on the meticulous examination of a state's reported nuclear materials and activities, evaluating their accuracy and completeness.
- **Varied Verification Measures:** The agency employs a range of verification tools, including on-site inspections, visits, and ongoing monitoring, ensuring rigorous oversight.

Dual Dimensions of Safeguards

- **Declared Nuclear Material Verification:** Through the inspection of reported nuclear materials and activities, IAEA ensures that a state remains transparent in its nuclear endeavors.
- **Non-Diversion Assurance:** A significant facet is the assurance of the absence of undeclared nuclear materials or activities, thereby averting any unauthorized deviation from peaceful usage.

40. Cleantech, for an inclusive green future in India

- Prime Minister Modi has discussed India's efforts to combat climate change in his Independence Day address.
- This has shown that climate action can be sustainable if it aligns with the development aspirations and contributes to economic growth. For example, infrastructure such as solar parks and EV charging stations can help combat climate change while also aiding growth.
- The challenge lies in integrating this green economy paradigm into broader development goals, such as providing job opportunities for youth, income opportunities for women, and diversifying farmers' incomes.

Case Studies on adoption of Green tech in rural areas

- Examples of successful cleantech solutions include solar dryers for tomato preservation in Andhra Pradesh, biomass-powered cold storage for farmers in Maharashtra (has helped make profits three to five times that of the original price) and solar silk reeling machines in Odisha.
- The rural economy in India faces challenges including unreliable electricity access and reliance on expensive diesel, which clean technology solutions powered by renewable energy could help address.
- According to research by CEEW, 12 specific cleantech solutions such as solar pumps, cold storages have the potential to impact 37 million livelihoods or 16% of the rural population.
- Despite these successes, there is still a need for a "structural boost" to fully realize the potential of clean technology in rural India.

Three-fold approach to scaling up the adoption of cleantech solutions in rural areas:

1. Leveraging existing government programs that support livelihoods, such as the Pradhan Mantri MUDRA Yojana and the Pradhan Mantri Formalisation of Micro food processing Enterprises (PMFME) scheme, to provide collateral-free loans and support for the adoption of cleantech solutions. Agriculture Infrastructure Fund which has only 15% fund utilization can also support the expansion of biomass powered cold storage.
2. Enabling large-scale financing of cleantech solutions by building capacities of bankers to assess creditworthiness, providing partial guarantees to mitigate risks, and structuring loan products to suit the needs of self help groups, farmers etc. For example, 'Powering Livelihoods' initiative has helped with

300 plus loans for cleantech solutions to women, self help groups and farmers by adopting the above principles.

3. Creating partnerships between technology innovators, manufacturers, distributors, service providers, financiers, and market-linkage players to build an overall ecosystem that enables access to technology, after-sales service, and market connectivity for rural entrepreneurs.

Conclusion:

By focusing on cleantech for livelihoods and jobs, especially in rural areas, India can make its green future inclusive and achieve its development goals.