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Topic 1. AN OIL SPILL IN AN IGNORED WETLAND IN TAMIL NADU

Important for the subject: Environment

Cyclone Michaung brought heavy rainfall to the city which also turned its attention to the wetlands of the heavily industrialised **Ennore-Manali region** in the northern part of the city where **oil had spilled over** from the premises of a public sector refinery.

- Oil spills polluted the **Buckingham Canal** and the **Kosasthalaiyar River**, both empties into the **Bay of Bengal**, at **Ennore, Tamil Nadu**.

Impact of oil spills on the environment:

- Organisms such as **plankton, plants, invertebrates, fish, birds, and mammals** live in habitats that include **water, sediments, beaches, wetlands, and forests**.
- Oil can kill **surface-dwelling animals and birds** by poisoning or suffocation, as well as affecting **buoyancy and natural waterproofing**.
- **Contaminated food supplies** mean animals may become **malnourished or poisoned over time**.
- **Toxic chemicals** remain in the **ocean for years**, often **sinking down to the seafloor** and **poisoning the sediment**.

NATIONAL OIL SPILL DISASTER CONTINGENCY PLAN (NOS-DCP):

- The Plan came in **1993**.
- **Indian Coast Guard** has been designated as the **Central Coordinating Authority** for **combating oil spills in Indian waters** and undertaking oil spill prevention and control.

The objectives of the plan are:-

- to establish an **effective system for the detection and reporting of spills**;
- to establish adequate measures for preparedness for oil and chemical pollution;
- to establish appropriate response techniques to prevent, control, and combat oil and chemical pollution, and dispose-off recovered material in an environmentally sound manner; and
- to establish record-keeping procedures to facilitate recovery of costs.

Oil Zapper:

- An **oil zapper** is used to **remove the oil** by using a **bio-remediation method**. Oilzapping is a method for **cleaning up significant oil spills from a surface**.

- This method involves releasing bacteria that consume hydrocarbon compounds found in waste hydrocarbon and crude oil.
- It is a patented light brown powder made of four different bacteria to break down these hydrocarbons. The powder may be applied to both land and water.

Uses of Oilzapper:

- Five distinct bacterial strains are immobilized and then released onto the oil spill in an oil zapper along with a carrier substance. An oil zapper can be used for the following purposes:
- To clear up shorelines after major oil spills. To clear out the hydrocarbon waste generated by oil refineries.
- To reduce the impact of harmful oil spills on the environment by converting the harmful compounds into simple carbon dioxide and water.

Ennore Creek:

- It is a backwater located in Ennore, Chennai along the Coromandel Coast of the Bay of Bengal.
- It is located in the zone comprising lagoons with salt marshes and backwaters, submerged under water during high tide and forming an arm of the sea with the opening to the Bay of Bengal at the creek.
- Once a flourishing mangrove swamp, the creek has been degraded to patches in the fringes mainly due to human activities in the region. The depth of the creek varies from 1 to 2 m and is shallow near the mouth.
- The north-south trending channels of the creek connect it with the Pulicat Lake to the north and to the distributaries of the Kosasthalaiyar River in the south.

Kosasthalaiyar river:

- It originates near Pallipattu in Thiruvallur district and drains into the Bay of Bengal. Its northern tributary Nagari River originates in the Chittoor district of Andhra Pradesh and joins the main river in the backwaters of Poondi reservoir.
- Its catchment area is spread over Vellore, Chittoor, North Arcot, Thiruvallur and Chennai districts.
- It branches near Kesavaram Anicut and this tributary flows to the Chennai city as Cooum River, while the main river flows to the Poondi reservoir. From Poondi reservoir it joins the sea at Ennore Creek.

Kamaraj Port in Ennore:

- Earlier known as the Ennore Port, is the 12th major port of India.

- It is located on the **Coromandel Coast** about 24 km north of **Chennai, Tamil Nadu**.
- It is the **only corporatized major port in India** and is registered as a company.
- The port was declared as a major port under the Indian Ports Act, 1908 in March 1999.

Topic 2. WHAT DOES COP-28 MEAN FOR CITIES?

Important for the subject: Environment

The 28th Conference of Parties (**COP-28**) in **Dubai** has also discussed cities and their future.

COP-28: Linkage With Cities

When the United Nations Framework Convention on Climate Change (UNFCCC) initiated the COP in 1995, 44% of people lived in cities.

- **Currently, 55% of the global population is urban and this is expected to reach 68% by 2050.**
- The urban world today **consumes nearly 75% of primary energy** and is responsible for **roughly 70% of CO₂ (76% of total GHG) emissions.**
- Hence, the desired results of the Paris commitments are not possible without addressing urban issues. City representatives have been arguing for multi-level green deal governance and for revising the governance and regulation of energy and climate action.
- Some European city groups have been staunchly advocating for direct actions in cities.
- Various groups argued for formally recognising the role of subnational governments in global climate change negotiations, accelerating and scaling up climate action by working across all levels of governance and sectors, and providing direct financing and technical assistance to cities and regions.
- This will require an ‘out of the box’ imagination as it would mean transgressing the authorities of federal governments.
- The efforts of city governments should be formally recognised in COP decision documents.

Role Of Global South?

- The cities of the Global South are **far more vulnerable** than their western counterparts.

Issues:

- The **city leaders are hardly empowered**. The **major employment is in the informal sector**. Adaptation is key as most cities are **vulnerable to climate induced disasters**.
- The pent up drive to attract investments to cities has further widened the gap between the rich and the poor. In most countries, and in India particularly, **40% of the urban**

population live in slums.

- Pollution is a major contributor in reducing life expectancies and social and economic inequities are quite inherent in their systems.
- So, to ensure fair participation in climate action plans and to claim loss and damage compensation, etc., there has to be a radical shift in the processes governing the cities.

One of the ways of achieving progress can be through:

- creating a climate atlas of these cities, mapping them and identifying hotspots.

Exclusion in NDCs:

- **During the preparation of Nationally Determined Contributions (NDCs) and National Adaptation Plans**, cities find themselves **excluded** from the process of climate action plans.
- There is hardly any representation of city leaders and civil society groups in this process.

Topic 3. INDIA'S 1ST ARCTIC WINTER EXPEDITION

Important for the subject: Environment

India will script history by commencing year-round observations in **Svalbard**, the **world's northernmost inhabited place, in the Arctic**.

- **The Himadri station and India's facilities in the Arctic:** It is situated in the **Ny-Alesund region** of Svalbard, Norway.
- It is **India's first permanent Arctic research station**. It is located at a distance of 1,200 kilometres (750 mi) from the **North Pole**.
- **India** has an **atmospheric science facility** called **Gruebadet Observatory** that houses various **atmospheric observation networks**.
- The country has initiated **new scientific projects** in the **Canadian High Arctic (Nunavut region)** and plans to initiate studies in **Greenland** soon.

Why has India taken fewer studies in the Arctic?

- Unlike **Antarctica**, which is **governed** by the **Antarctic Treaty**, the **Arctic region** belongs to various national jurisdictions.
- Various **geopolitical complications**, such as the current war between Ukraine and Russia, have made **half of the Arctic region (the Russian Arctic) inaccessible** to the world.

Why is it significant for India?

- Studying the **Polar-tropical climate teleconnections** will help us to better predict the

monsoon vagaries on a decadal scale.

- Several evidences show that many of the extreme precipitation events happening in India have their origins in the loss of Arctic sea ice.
- The increased intensification of Arabian Sea cyclones is associated with a warmer Arctic.

National Centre for Polar and Ocean Research, (NCPOR):

- The NCPOR, formerly known as the **National Centre for Antarctic and Ocean Research (NCAOR)** is an **Indian research and development institution**, situated in **Vasco da Gama, Goa**. It is the **nodal agency for India's polar expeditions**.
- It is an **autonomous institution** of the **Department of Ocean Development (DOD), Ministry of Earth Sciences**, Government of India which is responsible for administering the **Indian Antarctic Programme** and maintains the **Indian government's Antarctic research stations, Bharati and Maitri**.

Topic 4. HEAT WAVES TO INTENSIFY IN MADAGASCAR, ONE OF EARTH'S RICHEST BIODIVERSITY HOTSPOTS: WWA STUDY

Important for the subject: Environment

Madagascar has experienced a heat wave at least two months early this year. **Madagascar's population**, heavily affected by poverty and lacking access to basic amenities, faces **increased health risks** due to extreme heat. **Malaria** cases in **Antananarivo** are **rising** as **warmer temperatures expand the mosquito range**.

- Madagascar ranks **124th** out of **125** countries in the **2023 Global Hunger Index**, highlighting alarming levels of hunger with a score of 41.0.

Geography of Madagascar:

- **Madagascar** is the **world's fourth-largest island** and is **second-largest island country**, located just off the **western coast** of the **African mainland** in the **Indian Ocean**. **Antananarivo** is the capital city.
- Madagascar is a **global hotspot**, home to a vast array of unique plant and animal species found nowhere else on Earth. **Mangoky River**: One of **Madagascar's major rivers**, flowing from the central highlands to the **Mozambique Channel**, impacting local ecosystems and communities.
- Around **90%** of **Madagascar's wildlife is endemic**, featuring iconic species like **lemurs, fossas, chameleons**, and **unique flora** such as **baobab trees** and **orchids**.
- **Lemurs**: This primate group is **endemic of Madagascar**, and are wet-nosed primates of the superfamily Lemuroidea. With over **100 species of lemurs**, showcasing a range of sizes, behaviors, and habitats.
- **Tsingy de Bemaraha**: A **unique limestone formation** in western

Madagascar, characterized by sharp, needle-like limestone formations.

- **Threats to Biodiversity:** Deforestation, habitat loss due to agriculture, logging, and illegal wildlife trade pose significant threats to Madagascar's unique flora and fauna.

World Weather Attribution (WWA):

- Established in **2014**. It operates globally, with collaborations and contributions from climate scientists and institutions worldwide.
- **Aim and Objective:** World Weather Attribution aims to rapidly assess and attribute extreme weather events to climate change.
- Its objective is to provide quick, scientifically grounded analyses to determine the influence of human-induced climate change on specific weather events, thereby enhancing public understanding and awareness of the connections between climate change and extreme weather occurrences.

Topic 5. NGT QUESTIONS TAMIL NADU GOVERNMENT ON HOW OIL SPILL REACHED PULICAT

Important for the subject: Environment

The southern Bench of the National Green Tribunal (NGT) on Monday questioned the State government and the Chennai Petroleum Corporation Limited (CPCL) on how the oil spill reached Pulicat backwaters if, as per reports submitted by the government, the slick was stopped from entering the sea.

About National Green Tribunal:

- The National Green Tribunal has been established under the **National Green Tribunal Act 2010**. **New Delhi is the Principal Place** of Sitting of the Tribunal and **Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal**.
- NGT is mandated to make disposal of applications or appeals finally within 6 months of the filing of the same.

What is the composition of NGT?

- The Tribunal comprises the **Chairperson, the Judicial Members, and Expert Members**. They shall **hold office for a term of 5 years and are not eligible for reappointment**.
- The **Chairperson is appointed by the Central Government in consultation with the Chief Justice of India (CJI)**.
- A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
- **There are to be at least 10 and a maximum of 20 full-time Judicial members and**

Expert Members in the tribunal.

Powers & Jurisdiction

- Established for effective and expeditious **disposal of cases relating to environmental protection and conservation of forests and other natural resources.**
- It has appellate jurisdiction to hear appeals as a Court. The Tribunal is not bound by the procedure laid down under the **Code of Civil Procedure, 1908**, but shall be guided by principles of natural justice.

Basics of Pulicat Lake

- **Pulicat Lake is the second largest brackish water lagoon in India, after Chilika Lake.** It is present in the Coromondal Region i.e. Andhra Pradesh–Tamil Nadu Border.
- The barrier island of Sriharikota separates the lake from the Bay of Bengal and is **home to the Satish Dhawan Space Centre.**
- The lake encompasses the **Pulicat Lake Bird Sanctuary. Flamingo Festival** is held every year to promote tourism in Pulicat Lake and Nellapattu. It has been organized for the past 12 years.
- The primary inflows to Pulicat Lake are **Arani, Kalangi and Swarnamukhi.** About **96% of the Pulicat Lake is present in Andhra Pradesh** while only 3% is present in Tamil Nadu.
- The **Buckingham Canal, a navigation channel, is part of the lagoon on its western side.**

Topic 6. AFGHANISTAN LEFT OUT OF COP-28 AND HOPES FOR INCLUSION IN COP-29

Important for the subject: Environment

Humanitarian concerns have been raised over **Afghanistan being left out of United Nations climate negotiations for a third year in a row**, as the country grapples with worsening drought and floods.

- Afghanistan is one of the **countries most vulnerable to climate change**, but the country was **absent from the COP28 climate summit in Dubai. It has been left out of U.N. talks since the Taliban took over Kabul in 2021.**
- **No foreign government has formally recognised Taliban leadership and it doesn't have a seat at the U.N. General Assembly.**
- Foreign officials have cited the Taliban's restrictions on women as the reason for current isolationist policies, particularly its barring of girls and women from high school and universities.

- The U.N. Framework Convention on Climate Change (UNFCCC)'s COP Bureau, which is responsible for accrediting parties to the annual summits, decided at a November 2022 meeting to defer a decision on future Afghanistan representation.
- The Taliban's takeover of government institutions has also meant that Afghanistan is unable to access key U.N. climate funds, including the Green Climate Fund (GCF).

About GCF:

- The GCF was set up in 2010 under the UNFCCC's financial mechanism to channel funding from developed countries to developing countries to allow them to mitigate climate change and also adapt to disruptions arising from a changing climate.

How it helps?

- The Green Climate Fund will support projects, programmes, policies and other activities in developing country Parties using thematic funding windows.
- It was intended to be the centerpiece of efforts to raise Climate Finance of \$100 billion a year by 2020.
- The Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.
- The Fund will strive to maximize the impact of its funding for adaptation and mitigation, and seek a balance between the two, while promoting environmental, social, economic and development co-benefits and taking a gender-sensitive approach.

Who will govern the Fund?

- The Fund is governed and supervised by a Board that will have full responsibility for funding decisions and that receives the guidance of the Conference of Parties (COP). The Fund is accountable to, and functions under the guidance of, the COP.

Topic 7. HOW DO ANIMALS SEE IN THE DARK?

Important for the subject: Environment

Photoreception:

Photoreception is the activation of a biological process by light.

Most organisms, including humans, respond to light. Some animals react to light waves not perceived by humans.

- **Vertebrates have two types of photosensitive cells, rods and cones**, so called because

of their shape.

- The **rods**, which are **long and fat**, contain **large amounts of visual pigment** and they **mediate vision** under **dim illumination** (scotopic vision).
- The **cone cells**, which are **relatively small**, mediate **daylight vision** (photopic vision) and **colour sensation**.

Vision of Human Eyes:

- The **retinas of animals** active both **day and night**, as are those of **humans**, contain both **rods and cones**.
- In parts of the **human retina**, the **rods and cones** are **intermingled** and the **nervous system provides a switching mechanism** that permits adjustment for light conditions.

Vision in nocturnal and diurnal animals:

- In **diurnal animals**, the **lens is smaller** and the **front surface is flatter**. Thus the **focal length is longer** and so the image on the retina is **larger and dimmer** than in the **nocturnal eye**. As a result, the **resolution is higher**.
- The **retinas of diurnal animals** have **localised areas** with a **high density of cone cells**. (The eyes of most birds have two such areas.)
- In **nocturnal animals**, the **optical arrangement of the eyes** suggests that resolution is sacrificed for **high light-gathering power**.
- In **nocturnal animals**, the **retina is mainly made up of rod cells**. **Rhodopsin**, a **photosensitive pigment present in rods**, is **decolourised by photons** (light particles) and slowly regenerated in the dark. This ensures **better vision for them in dim light**.

Topic 8. EL NINO-FUELLED NORTHEAST MONSOON CAUSED THE DELUGE IN SOUTH TAMIL NADU

Important for the subject: Environment

Many parts of **southern Tamil Nadu** got flooded due to **Cyclone Michaung** in early December. The cause for this is an **active Northeast monsoon (NEM)** fuelled by the **El Nino phenomenon**, which is peaking right now.

- The **El Nino** is the **warmer-than-normal phase** of the **El Nino Southern Oscillation Phenomenon (ENSO)** in the **central and eastern Pacific Ocean** and generally **enhances rainfall extremes** during the **NEM**.
- **El Nino** provides the **intensity** while **low-pressure systems** or **cyclonic circulations** around the region provide the **required moisture convergence** for rainfall events to the **NEM**.
- **Cyclonic circulations** are whirls of winds in the **upper layers of the atmosphere**. They

usually induce low-pressure areas in the atmosphere's lower layers, which eventually cause rainfall.

- Sometimes, the cyclonic circulations can cause rainfall all by themselves by bringing moisture-laden winds into the region.
- Upper-level divergence is the spreading out of air in the upper layers of the atmosphere, which causes air from below to rise. This leads to other winds taking their place. This process is known as 'low-level convergence'.

What are North-East Monsoons (NEM)?

- Also known as the "retreat of monsoon", NEM enters India from the northeast. The wind blows from the sea to the land in this type of monsoon.
- The monsoon trough weakens and shifts southward as the monsoons retreat. As a result, the pressure gradient is minimal. The moisture from the Indian Ocean (Bay of Bengal region) is carried by the monsoon winds.
- It is limited to south India, bringing rain to Tamil Nadu, Puducherry, Karaikal, Yanam, Andhra Pradesh, Kerala, Mahe, and south interior Karnataka from October to December.
- Low-pressure systems, depressions, and cyclones cause the associated rainfall, also known as the winter monsoon.
- This is Tamil Nadu's main rainy season, with the state receiving 48% (447.4mm) of its annual rainfall during these three months.

Topic 9. OUTCOMES OF THE COP-28 CLIMATE SUMMIT

Important for the subject: Environment

The 28th Conference of Parties (COP) to the UNFCCC happened in Dubai, UAE this year.

Loss and Damage Fund:

- The agreement was reached at COP-27 to create a 'Loss and Damage' (L&D) fund and the fund was operationalized at COP-28. World Bank was designated to oversee and administer the fund.
- Only a meagre \$790 million has been pledged so far, by a few nations, despite the corpus requiring \$100 billion to more than \$400 billion a year.

Global stocktake:

- The COP28 summit saw the first global stocktake (GST).
- According to the UNFCCC, the GST enables countries and other stakeholders to see

where they are collectively making progress towards meeting the goals of the Paris Agreement — and where they are not.

- Countries at COP-28 decided to **transition away** from fossil fuels and also pledged to **triple renewable energy capacity by 2030**. More than **20 countries** also pledged to **triple their nuclear energy capacity**.
- However, the **transition from fossil fuels is restricted to energy systems alone**; they can continue to be used in the **plastics, transport, and agriculture sectors**.
- The declaration also refers to ‘**transitional fuels**’, such as **natural gas**, for ensuring energy security. The declaration called for accelerated climate mitigation using **carbon capture and storage (CCS)** and **carbon removal (CDR)** technologies.

Green Finance:

- **Developed nations and private sectors** are asked to take the lead in **grant-oriented, concessional finance to enable equitable transition in developing countries**.
- **COP28** saw the establishment of **innovative global green finance mechanisms** to support **developing nations** in their **transition to sustainable practices**.
- The **Green Climate Fund** received fresh support of **\$3.5 billion**, allowing it to finance adaptation and mitigation projects in **vulnerable regions**. An additional **\$188 million** was pledged to the **Adaptation Fund**.

ALTERRA:

- The **COP-28 Presidency** introduced **ALTERRA**, an **investment initiative** with an ambitious goal to **globally mobilise an unprecedented sum of \$250 billion by 2030**.

How did India fare at COP-28?

UAE Declaration on Climate and Health:

- Partnership between **COP-28 Presidency** and **WHO**, recognizing **health impacts of climate change**.
- Acknowledges benefits of climate action, like **reduced air pollution and healthcare costs**. Signed by **123 countries** committing **\$1 billion**, but **India didn't sign it**.
- **Reason:** Reducing **GHG emissions in health sector** could affect gases used for cooling, potentially compromising healthcare needs, especially in rural areas due to ongoing healthcare infrastructure growth.

Global Methane Pledge:

- GMP received attention at **COP-28**, with **Climate and Clean Air Coalition** as the **new secretariat**.
- Partners announced over **\$1 billion** in new grants to **reduce methane emissions in**

agriculture, waste, and gas sectors. 150+ countries signed the pledge, but **India didn't**.

- **Reason:** It may shift focus from carbon dioxide to methane, a GHG with a shorter lifetime.
- **India's methane emissions** are **primarily** from **rice cultivation** and **livestock rearing**, crucial for **small and marginal farmers' livelihoods**.
- **India** abstained from both declarations due to **concerns** about **compromising healthcare infrastructure growth** and the **focus shift to methane**, which doesn't align with its emissions profile dominated by **agriculture** and **livestock-related methane emissions**.

Key takeaways:

- Acknowledgement of the role of nature-based solutions for biodiversity conservation and climate.
- Some 134 countries also agreed to a landmark declaration to transition to sustainable and resilient food systems.

Challenges:

- Dispute between developed and developing nations over fossil-fuel subsidies. Increasing the flow of climate finance and technologies to facilitate just job transitions and inclusive development.
- Market mechanisms, financial resource allocation, the role of the World Bank as the agency for managing the L&D fund, and private sector engagement in climate action.

Topic 10. WHY THE UK BANNED AIR FRANCE, LUFTHANSA, AND ETIHAD ADS OVER 'GREENWASHING' CLAIMS

Important for the subject: Environment

UK's ad regulator banned **Air France, Lufthansa, and Etihad** ads for allegedly **misleading consumers** on air travel's **environmental impact**.

- The **Advertising Standards Authority (ASA)** found ads claiming sustainability **lacked evidence**, violating **UK ad code** and accused of **green washing**.

Green washing:

- Green washing is when firms or governments give a **false impression** that all of their products or activities are climate-friendly or help in reducing emissions.
- Moreover, green washing may also occur when a company highlights sustainable aspects of a product to overshadow its environmentally damaging activities.
- It can be performed through the use of environmental imagery, misleading labels, and hiding trade offs.

- Examples like the **Volkswagen emissions scandal** illustrate this tactic, where a company falsely portrayed its products as environmentally friendly.

Aviation Industry Emissions:

- **Aviation** contributes **2.5% of human-produced CO₂ emissions**, as per the **IPCC 2022** estimates, with predictions of **increasing to 5% by 2050**.
- Consideration of **non-CO₂ emissions** like **water vapor** would attribute nearly **5% of historical global warming** to the **airline industry**.
- **Domestic flight emissions** are attributed to a **country's accounts**, but **international flight emissions** (counted as **bunker fuels**) have **no assigned responsibility to any country**.
- This lack of accountability raises concerns about controlling these emissions on a global scale.

Topic 11. ETHANOL BLENDING POLICY

Important for the subject: Environment

While **ethanol blended petrol (EBP)** increased from **1.6% in 2013-14** to **11.8% in 2022-23**, the **20% target by 2025** has run into trouble with low sugar stocks in **2022-23** and impending shortfall in sugarcane production this year.

- **NAFED** and **National Cooperatives Consumers' Federation of India (NCCF)** have authorised to procure **maize (corn)** for supplying **ethanol distilleries**.

Ethanol from maize (corn):

- Only **5-7%** of the **world's corn output** was used for **ethanol production** and the **U.S.** has a **corn based ethanol programme**.
- **Challenge:** Using corn for producing ethanol directly reduces its use as food or livestock feed. It directly links food prices to crude oil prices through the demand side.
- High corn prices also increases the price of other soft grains like wheat/barley.

Ethanol from sugarcane:

- **Sugarcane based ethanol production** is preferred in **tropical countries** like **Brazil** and **India**.
- **Challenge:** More land under **water-intensive sugarcane** production can **displace food production** and also **degrade water table**.
- In case of **sugarcane**, ethanol is produced by processing the **molasses (C-heavy/B-heavy)** and constitutes **minimal trade-off** with **sugar output**. The **B-heavy molasses** path produces **less sugar** and **ethanol** simultaneously from sugarcane.

- **Ethanol** can also be produced from **cane juice** without the extraction of **sugar**, but it may lead to conflict between **sugar production** and **ethanol production**. This process gives substantially higher yield of ethanol.

Sugarcane molasses:

- It is a **viscous, dark and sugar-rich by-product of sugar extraction** from the **sugarcane (*Saccharum officinarum* L.)**. It is a **major feed ingredient**, used as an **energy source** and as a **binder in compound feeds**.
- Both the **sugar extraction process** and the **sugar refining process** yield molasses, and each step of these processes output **specific types of molasses**:
- **Integral high-test molasses** is produced from **unclarified sugarcane juice**. Because it is **concentrated** from unclarified sugarcane juice, heavy incrustations and scum deposits lead to frequent mill interruptions and, therefore, to increased factory maintenance costs.
- **A molasses (first molasses)** is an **intermediate by-product** resulting from **first sugar crystal extraction (A sugar)**, from initial processing at the sugar factory. A molasses contains **80-85% DM**. If it has to be stored, it should be inverted in order to prevent crystallization.
- **B molasses (second molasses)**: It has approximately the **same DM content** as **A molasses** but contains **less sugar** and **does not spontaneously crystallize**.
- **C molasses (final molasses, blackstrap molasses, treacle)** is the **end by-product** of the processing in the sugar factory. It still contains considerable amounts of **sucrose** (approximately 32 to 42%).
- **C molasses does not crystallize** and can be found in **liquid or dried form** as a **commercial feed ingredient**.
- **Syrup-off (liquor-off, jett)** is the **end by-product** from the **centrifugation** of the final refined masecuite in a raw sugar refinery.
- Normally, **syrup-off** is sent to the raw sugar section of the refinery where it is further processed in order to recover more sucrose.
- Due to its **high content of sucrose (90-92% DM)**, it is an **excellent energy source** for **monogastrics** but can be an expensive ingredient.
- **Refinery final molasses** is the **by-product of refined sugar extraction**. It has a very similar composition to that of **C molasses** produced in a raw sugar factory and it is stored in the same tanks.
- In some countries the juice is extracted in a simple animal or mechanically driven press, then boiled in open vats. In this rudimentary process, **pan (uncrystallized) sugar** is produced and the **by-product molasses** is called "**melote**". It contains only **50% DM**.

Topic 12. RESEARCHERS PATENTING NEW TREATMENT FOR NICOTINE ADDICTION

Important for the subject: Environment

Researchers have demonstrated a practical approach for treating nicotine dependence. Currently, Nicotine **Replacement Therapy (NRT)** is used which relies on providing additional nicotine to the body. Researchers have now turned to nicotine's oxidative metabolite, **cotinine**.

- Tobacco use is a global pandemic, affecting an **estimated 1.2 billion people**, which poses substantial health burden and costs.
- With approximately **5 million tobacco-related deaths annually**, cigarette smoking is the leading cause of preventable premature mortality in the world.
- Death is mainly caused by **lung cancer, coronary heart disease, chronic obstructive pulmonary disease, and stroke**.
- The risk of serious disease diminishes rapidly after quitting and permanent abstinence is known to reduce the risk of lung cancer, heart disease, chronic lung disease, stroke, and other cancers.

About Nicotine replacement therapy

- **NRT is the most common medication used to assist in quit attempts.** Its main mechanism of action is to partially replace the nicotine formerly obtained from tobacco smoking,
- which aids smoking cessation by reducing the severity of withdrawal symptoms and cravings and also reduces the reinforcing effects of nicotine delivered via tobacco while providing an alternative source of some reinforcing and cognitive effects.
- **NRT does not completely eliminate all symptoms of withdrawal because the available delivery systems do not reproduce the rapid and high levels of nicotine achieved through inhalation of cigarette smoke.**
- Differences in formulations may have an impact on the efficacy for some of these effects, but there is little direct evidence that one nicotine product is more effective than another.

How Cotinine can be an alternative approach

- **Using ascorbic acid as a potential reducing agent, researchers converted cotinine in smokers' plasma back to nicotine, targeting both nicotine addiction and detoxification simultaneously.**
- **Ascorbic acid in a specified dose (Vitamin C)** converts cotinine back to nicotine within the smokers' plasma. Individuals find it difficult to quit smoking because of nicotine withdrawal.

- **Current NRT products provide additional nicotine to the body. This turned researchers to cotinine.**
- Generally, 80% of nicotine accumulates as cotinine in the body, while the remaining 20% is eliminated in urine.
- Cotinine can cause cancer. So, for the first time, instead of adding on to the nicotine content in the body, researchers have showcased that vitamin C can be utilised to recirculate cotinine.
- **Side effects are negligible, the person does not receive additional nicotine and detoxification occurs at the end of the cycle.**

Topic 13. COMING SOON, A 'CAFETERIA' FOR OIL SPILL-HIT BIRDS AT ENNORE CREEK

Important for the subject: Environment

Wildlife Trust of India (WTI) and **Besant Memorial Animal Dispensary (BMAD)** plan to establish **feeding stations for birds** at **Ennore creek**. They **aim** to catch the birds to rehabilitate and care for them.

- The **Department of Environment, Climate Change, and Forests**, along with **WTI**, **local volunteers**, and the **Wildlife Warden of Chennai**, are working together to assess and rescue affected birds.
- While many have flown away, some, like **pelicans** and **painted storks**, have been severely impacted. To capture sick birds, the team plans to create **feeding stations** with **nets**.
- **Trapping birds in nets** is being considered in **Ennore Creek** as a **conservation measure** due to a drastic decline in the bird population caused by contamination from an oil spill.
- The oil spill has affected not only the birds but also the fish.

Ennore Creek:

- It is a **backwater** located in **Ennore, Chennai** along the **Coromandel Coast** of the **Bay of Bengal**.
- It is located in the zone comprising **lagoons** with **salt marshes** and **backwaters**, submerged under water during **high tide** and forming an arm of the sea with an opening to the **Bay of Bengal** at the creek.
- Once a flourishing **mangrove swamp**, the creek has been degraded to patches in the fringes mainly due to human activities in the region. The depth of the creek varies from **1 to 2 m** and is shallow near the mouth.

- The north–south trending channels of the creek connect it with the **Pulicat Lake** to the **north** and to the distributaries of the **Kosasthalaiyar River** in the **south**.

Wildlife Trust of India (WTI):

- WTI is an **Indian nature conservation organisation**. It was formed in **November 1998** in **New Delhi, India**, as a response to the rapidly deteriorating condition of wildlife in India.
- WTI is a **registered charity in India** (under Section 12A of the Income Tax Act, 1961).

Topic 14. MISSING FOR 42 YEARS, FLYING SQUIRREL RESURFACES IN ARUNACHAL

Important for the subject: Environment

A **nocturnal flying squirrel** has resurfaced in **Arunachal Pradesh** after going missing for **42 years**. It was last recorded in the **Namdapha Tiger Reserve** in **Arunachal Pradesh's Changlang district**.

- The **Aaranyak study** was supported by **Re:Wild**, a global wildlife conservation organisation, and the **Small Mammal Specialist Group** of the **International Union for Conservation of Nature's Species Survival Commission**.

Namdapha flying squirrel (Biswamoyopterusbiswasi):

- They are an **arboreal, nocturnal flying squirrel endemic to Arunachal Pradesh** in **northeast India**, where it is known from a single specimen collected in **Namdapha National Park** in **1981**.
- It was the **sole member** in the genus **Biswamoyopterus** until the description of the **Laotian giant flying squirrel (Biswamoyopteruslaensis)** in **2013**.
- What sets the **Namdapha flying squirrel** apart from the **red giant flying squirrel** is the **prominent tuft of hair** on the **ears** of the former.

Red giant flying squirrel (Petauristapetaurista):

- It is a species of **rodent** in the family **Sciuridae (squirrels)**.
- It is found in a wide variety of **forest–types, plantations** and more open habitats with scattered trees in **Southeast Asia**, ranging north to the **Himalayas** and **southern and central China**.
- **One of the largest arboreal squirrels**, all populations have at least some reddish-brown above and pale underparts, but otherwise, there are significant geographic variations in the colours.
- **Mostly nocturnal** and **able to glide** (not actually fly like a bat) **long distances** between

trees by spreading out its **patagium**, skin between its limbs.

- It is a **herbivore** and the female has one, infrequently two, young per litter. It is **not a threatened species**.

Topic 15. AMENDMENTS TO CARBON CREDITS TRADING SCHEME (CCTS) IN INDIA

Important for the subject: Environment

The **Ministry of Power in India** has introduced amendments to the **Carbon Credits Trading Scheme (CCTS)**. These amendments pave the way for India to establish its own standards for carbon trading.

Role of Bureau of Energy Efficiency (BEE):

- The amendments instruct the carbon credits administrator, the **Bureau of Energy Efficiency (BEE)**, to develop standards and register projects under the offset mechanism.
- **BEE is tasked with both “validation” and “verification” of carbon credits**, as opposed to only “verification” in the original scheme.

Deepening Indian Carbon Credit Market:

- The amendments aim to **deepen the Indian carbon credit market by allowing ‘non-obligated entities’ to register decarbonization projects and generate carbon credits**.
- Non-obligated entities, which were initially limited to purchasing credits, can now register projects and seek the issuance of Carbon Credit Certificates.

Offset Mechanism for Non-Obligated Entities:

- The introduction of an “**offset mechanism**” **allows non-obligated entities to register projects for accounting greenhouse gas emission reduction or removal, leading to the issuance of Carbon Credit Certificates**.

Prescribing Limits for Non-Obligated Entities:

- Non-obligated entities, unlike obligated entities, do not have a prescribed limit for their greenhouse gas emissions.
- The **Bureau of Energy Efficiency (BEE)** is tasked with **identifying sectoral scope and methodologies for the offset mechanism with the support of technical committees**.

Elimination of Overseas Certification Dependency:

- Once BEE establishes standards, **Indian entities will no longer have to rely on overseas standards agencies for validating their carbon credits**.
- The move is **expected to reduce costs and time associated with overseas certification**,

making it more convenient for Indian carbon credit generators.

- These amendments reflect efforts to enhance and streamline the carbon credits trading scheme in India, providing a regulatory framework that encourages participation from a broader range of entities in decarbonization projects.

About Carbon Credit

- The term “Carbon Credit” refers to a tradable permit that represents the right to emit a specific amount of carbon dioxide or an equivalent amount of another greenhouse gas.
- Essentially, a carbon credit is a unit of measurement that equals one tonne of carbon dioxide that has been removed, reduced, or sequestered from the atmosphere.
- It is a market-based approach to incentivize businesses and countries to reduce their greenhouse gas emissions.

Carbon Credit Trading Scheme (CCTS)

- The ‘CCTS’ stands for the Carbon Credits Trading Scheme, and it is a scheme for the reduction or removal of greenhouse gas (GHG) emissions. The central government notifies and governs this scheme.
- **Background:** The Energy Conservation (Amendment) Bill, 2022, empowered the central government to specify the carbon trading scheme in consultation with the Bureau of Energy Efficiency (BEE).

Features of CCTS:

- **Accredited Carbon Verifier:** An accredited agency, recognized by the BEE, is responsible for validation or verification activities under the CCTS.

Indian Carbon Market Governing Board (ICMGB):

- Established for oversight, rule-making for the Indian carbon market, and guidelines for selling carbon credit certificates abroad.
- Environment secretaries serve as ex-officio co-chairmen. Meets at least once a quarter.

Bureau of Energy Efficiency (BEE):

- Administers the Indian carbon market and acts as the secretariat for ICMGB. **Grid Controller of India Ltd:** Serves as the registry for the Indian Carbon Market.
- **Central Electricity Regulatory Commission (CERC):** Regulator for trading activities

under the Indian carbon market.

Types of Carbon Markets:

- **Compliance Markets:** Created to comply with laws and regulations.
- **Voluntary Markets:** Involves the voluntary issuance, buying, and selling of carbon credits.

Features of The Energy Conservation (Amendment) Act 2022:

1. Establishes provisions for carbon markets to encourage carbon trading and reduce emissions.
2. Mandates the use of non-fossil sources for energy and feedstock.
3. Establishes a domestic carbon market in India.
4. Brings large residential buildings under the Energy Conservation regime.
5. Enhances the scope of the Energy Conservation Building Code.
6. Amends penalty provisions for stricter enforcement.
7. Expands the governing council of the Bureau of Energy Efficiency.
8. Empowers State Electricity Regulatory Commissions for energy conservation functions.
9. Mandates the use of clean energy, including green hydrogen.

BEE Star Rating

- The BEE Star Rating, implemented through the **Standards and Labelling Program introduced in 2006, is a labeling system that provides consumers with information about the energy efficiency** of various appliances.

Bureau of Energy Efficiency (BEE):

- BEE is a **statutory body established under the Energy Conservation Act, 2001.**
- BEE assists the government in developing policies and strategies focused on **self-regulation and market principles.** The primary objective is to **reduce the energy intensity of the Indian economy.**

State Energy Efficiency Index (SEEI) 2021-22

- The State Energy Efficiency Index (SEEI) 2021-22 is an **assessment framework developed by the Bureau of Energy Efficiency (BEE) in collaboration with the Alliance for an Energy-Efficient Economy (AEEE).**
- The index aims to track the progress of states and union territories (UTs) in

implementing energy efficiency initiatives.

Framework and Indicators:

- SEEI 2021-22 employs an **updated framework with 50 indicators aligned with national priorities**.
- These indicators are designed to monitor the outcomes and impacts of state-level energy efficiency initiatives.

Objective:

- The primary objective of SEEI is to **drive decarbonization efforts** in states. It provides a basis for outlining recommendations to assist states in promoting energy efficiency.
- The ultimate goal is to **contribute to the fulfillment of Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDC)**.

Topic 16. UNNATEE (UNLOCKING NATIONAL ENERGY EFFICIENCY POTENTIAL)

Important for the subject: Environment

The Bureau of Energy Efficiency (BEE) has formulated a national strategy document called UNNATEE (Unlocking National Energy Efficiency potential) to accelerate energy efficiency in India.

- **Framework and Implementation Strategy:** UNNATEE provides a clear framework and implementation strategy to establish a connection between energy supply-demand scenarios and energy efficiency opportunities in the country.
- **Linkage to Environmental and Climate Change Goals:** The document outlines a comprehensive roadmap to address India's environmental and climate change mitigation goals through targeted energy efficiency measures.
- **UNNATEE, as a strategic document, aims to guide and enhance India's efforts in meeting its energy efficiency targets and contributing to broader sustainability and climate change mitigation objectives.**

UTPRERAK (Unnat Takniki Pradarshan Kendra)

- **The Ministry of Power in India has established a Centre of Excellence named UTPRERAK (Unnat Takniki Pradarshan Kendra) with the aim of accelerating the adoption of energy-efficient technologies in the Indian industry.**

Objectives:

Reference Institution and Technology Showcase:

- UTPRERAK will function as a **reference institution, showcasing energy-efficient technologies across various industry sectors.**

Training and Education:

- The centre is tasked with **providing training and education in energy efficiency** to more than 10,000 energy professionals over the next five years.

Emission Reduction and Technology Adoption:

- UTPRERAK will play a pivotal role in assisting industries in meeting emission reduction targets. It aims to **promote the widespread adoption of new and energy-efficient technologies within industries.**

Policy Inputs:

- The centre will provide valuable inputs for the formulation of national energy policies, contributing to the development of effective strategies.

Research Facilitation:

- **UTPRERAK will facilitate and support research initiatives** focused on energy-efficient solutions.
- **Implementing Authority:** UTPRERAK has been established by the Bureau of Energy Efficiency (BEE).

Topic 17. KAKRAPAR-4 NUCLEAR REACTOR ATTAINS CRITICALITY*Important for the subject: Science and Technology*

The **fourth unit** of the **Kakrapar Atomic Power Project (KAPP-4)** in **Gujarat**, with **700 MWe capacity**, started a **controlled fission chain reaction** and thus became **critical**. **Kakrapar** is situated about 80 km from **Surat**.

- **NPCIL**, part of **India's Department of Atomic Energy**, indigenously built **700 MWe pressurised heavy water reactors (PHWRs)**, the **largest of their kind in India**.
- These reactors use **natural uranium as fuel** and **heavy water as coolant and moderator**, similar to other **indigenous PHWRs** operated by **NPCIL**. **Unit-3 of KAPP** started producing commercial electricity from August 30.
- The reactors met **Atomic Energy Regulatory Board conditions** and achieved **criticality**, signifying safety and functionality.
- **Criticality** is the **normal operating condition** of a **nuclear reactor**, in which **nuclear fuel sustains a fission chain reaction**.

- A reactor achieves **criticality** (and is said to be critical) when **each fission releases a sufficient number of neutrons to sustain an ongoing series of nuclear reactions**. Indian industries supplied equipment for the reactors, which boast **advanced safety features** like **steel lining** and a **passive decay heat removal system**.
- NPCIL currently operates **23 nuclear reactors** with **7,480 MWe capacity**, with **nine units under construction** and plans for **10 more reactors** in the pre-project phase, totalling **7,000 MWe**.

India's Three-Stage Nuclear Power Programme:

- India's three-stage nuclear power programme was **formulated by Homi Bhabha in the 1950s** to secure the country's long term energy independence, through the **use of uranium and thorium reserves found in the monazite sands** of coastal regions of South India.
- **Stage 1- Pressurized heavy water reactor (PHWR):** The first stage involved using natural uranium to fuel PHWR to produce electricity and Plutonium-239 as a by product. Also the by product plutonium-239 would be used in the second stage.
- **Stage 2- Fast breeder reactor (FBR):** The second stage involves using plutonium-239 to produce fuel, which would be used in Fast Breeder Reactors.
- Plutonium 239 undergoes fission to produce energy. Once a sufficient amount of plutonium-239 is built up, thorium will be used in the reactor, to produce Uranium-233. This uranium is crucial for the third stage.
- **Stage 3- Advanced Heavy Water Reactor (AHWR):** The main purpose of stage-3 is to achieve a sustainable nuclear fuel cycle. The advanced nuclear system would be used a combination of Uranium-233 and Thorium.
- **Thorium** absorbs the neutrons, which can more efficiently produce more Plutonium in Fast Breeder Reactor for a faster growth.
- Thus, the ultimate objective of the above programme is to create capacity to use Thorium for sustainable production of nuclear energy and make India energy independent.

Topic 18. KRAFT PROCESS, A PAPER MAKER'S CRAFT

Important for the subject: Science and Technology

It is a technique that accepts **wood chips** as **input** to **produce cellulose fibres**, which are then used to make **paper** and other materials used in everyday objects. **Paper is most commonly produced by the kraft process** today.

Process:

- The process is **chemical** in nature. The chips are **treated with water, sodium hydroxide, and sodium sulphide** – the last two forming a **highly alkaline**

mixture called **white liquor** – at a relatively **high temperature**.

- This breaks the bonds between **lignin** (an organic polymer and important constituent of cell walls), **hemicellulose** (cellulose-like fibres that are shorter), and **cellulose**.
- The steps are followed by those to obtain the **wood pulp**, wash off and recover the reaction chemicals, bleaching, and processing.

Advantage:

- **Kraft-process paper** has **higher sulphidity** (a measure of **strength**) than that produced by other processes.

Drawbacks:

- The process is **not environmentally friendly**. It requires a **large volume of water**; the process of **removing lignin** from the wood chips also **discharges the lignin through water** along with **dissolved carbon, alcohol ions, and heavy metals**.

Topic 19. THE ERA OF CRISPR THERAPEUTICS IS HERE – WHAT CAN WE EXPECT?

Important for the subject: Science and Technology

The medical world is witnessing a significant breakthrough with the approval of CRISPR-based therapies for **sickle-cell disease and β -thalassemia in the U.K. and the US**.

- These advancements hold the potential to transform the lives of millions suffering from these inherited blood disorders.

Historical Background of CRISPR Technology

- **Origins of CRISPR:** Discovered in archaea in 1993, **CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)** elements were later found to form an **antiviral defense system in bacteria with Cas (CRISPR-associated) proteins**.
- **Nobel Prize-Winning Innovation:** Emmanuelle Charpentier and Jennifer Doudna's work on CRISPR-Cas9 as a 'molecular scissor' earned them the 2020 Nobel Prize in chemistry.
- **Eukaryotic Genome Editing:** Subsequent research demonstrated CRISPR-Cas9's ability to edit eukaryotic genomes, paving the way for various applications in genetic therapies and agriculture.

CRISPR Applications in Medicine

- **CRISPR-Based Treatment for Blood Disorders:** The MHRA in the U.K. and the FDA in the U.S. approved '**Casgevy**' for treating sickle-cell disease and transfusion-dependent β -thalassemia.

- **Treatment Mechanism:** Casgevy involves **modifying a patient's blood stem cells to correct the genetic defect** causing sickling, then regrafting them to produce normal red blood cells.
- **Historical Context:** This approval marks a full circle from Linus Carl Pauling's description of sickle-cell disease as a molecular disorder 74 years ago.

Emerging CRISPR Technologies and Approaches

- **Base-Editing:** This technique allows genome editing at the single nucleotide level.
- **Prime Editing:** A newer method that uses a search-and-replace strategy for precise genome modifications.
- **Epigenetic Modifications:** CRISPR systems are also being developed to target epigenetic effects.

Future Prospects and Challenges

- **Safety and Accuracy Concerns:** Issues like off-target events, where CRISPR-Cas9 edits unintended parts of the genome, pose significant challenges.
- **Balancing Risks and Benefits:** While the potential of these technologies is enormous, their risks must be weighed against both short- and long-term benefits.
- **Ongoing Research and Surveillance:** Continuous scrutiny is essential to uncover potential side effects that are currently unknown.

Topic 20. CYBERTHREATS: CENTRE SETS UP SECURE EMAIL NETWORK FOR STAFF OF CRITICAL DEPARTMENTS

Important for the subject: Science and Technology

In response to rising cyber attacks, the **Centre has established a secure e-mail system for 10,000 users** across critical ministries and departments.

- The **National Informatics Centre (NIC)** has designed this system, incorporating Zero Trust Authentication (ZTA).

About Zero Trust Authentication (ZTA)

- ZTA is a security concept and framework that **operates on the principle of “never trust, always verify.”**
- This approach to cyber security is a significant shift from traditional security models that operated under the assumption that everything inside an organization's network should be trusted.
- In contrast, Zero Trust assumes that trust is never granted implicitly but must be continually evaluated and authenticated, regardless of the user's location or the network's

perimeter.

Key Principles of ZTA

- **Least Privilege Access:** Users are granted only the minimum level of access needed to perform their job functions. This limits the potential damage in case of a security breach.
- **Strict User Verification:** Every user, whether inside or outside the organization's network, must be authenticated, authorized, and continuously validated for security configuration and posture before being granted access to applications and data.
- **Micro-segmentation:** The network is divided into small zones to maintain separate access for separate parts of the network. If one segment is breached, the others remain secure.
- **Multi-Factor Authentication (MFA):** ZTA often requires multiple pieces of evidence to authenticate a user's identity. This could include something the user knows (password), something the user has (security token), and something the user is (biometric verification).
- **Continuous Monitoring and Validation:** The system continuously monitors and validates that the traffic and data are secure and that the user's behaviour aligns with the expected patterns.

Benefits of Zero Trust Authentication

- **Enhanced Security Posture:** By verifying every user and device, Zero Trust reduces the attack surface and mitigates the risk of internal threats.
- **Data Protection:** Sensitive data is better protected through stringent access controls and encryption.
- **Compliance:** Helps in meeting regulatory requirements by providing detailed logs and reports on user activities and data access.
- **Adaptability:** Zero Trust is adaptable to a variety of IT environments, including cloud and hybrid systems.

Implementation of Zero Trust Authentication

- **Technology:** Implementation of Zero Trust requires technologies like identity and access management (IAM), data encryption, endpoint security, and network segmentation tools.
- **User Education and Awareness:** Training users on the importance of cybersecurity and the role they play in maintaining it is crucial.
- **Policy and Governance:** Organizations need to establish comprehensive security policies that enforce Zero Trust principles, including how data is accessed and protected.

Topic 21. CUSTOMISED MRNA IS THE NEXT FRONTIER IN PERSONALISED MEDICINE

Important for the subject: Science and technology

mRNA (messenger RNA) technology has emerged as a **ground breaking platform in the realm of personalized medicine**, showcasing the ability to be easily customized for effective and **tailored therapies with minimal side effects**.

Basics of mRNA:

- At its core, mRNA is a **scalable and versatile molecule that plays a vital role in cellular functions**.
- Unlike traditional drugs, **mRNA is inherently present within the human body**, with cells naturally creating **mRNAs to serve as instructions for protein synthesis**.
- When cells need to produce specific proteins essential for various functions, they rely on **mRNA as the messenger carrying the genetic code or recipe for protein creation**.

How mRNA Makes Excellent Medicine:

- The unique qualities of mRNA make it an ideal candidate for therapeutic applications. **Scientists can manipulate mRNA to create powerful medicines that address diverse cellular issues**.
- Since the language of **mRNA consists of four nucleotides**, scientists can easily decipher the codes and **understand the instructions for protein synthesis**.
- **Mutations in the DNA can disrupt these instructions**, leading to diseases, and mRNA medicines offer a way to correct or replace these faulty instructions.
- The production of mRNA treatments is not only scalable but also consistent. Unlike traditional drugs that require distinct manufacturing methods for each compound, the process of creating mRNA remains the same for all types.
- This uniformity simplifies the production process, making it akin to mastering a basic recipe and allowing for endless variations.
- Moreover, the transient nature of mRNA within cells allows for easy dosage adjustments based on changing patient needs.
- As cells naturally destroy mRNA when it is no longer required, the flexibility in altering doses ensures that treatments can be fine-tuned to accommodate dynamic health conditions.

mRNA Vaccines and Beyond:

- The mRNA technology gained significant recognition with the development of **COVID-19 vaccines by Moderna and Pfizer-BioNTech, marking the first FDA-approved**

mRNA-based medicines.

- These vaccines demonstrated the adaptability of mRNA-based therapies, enabling quick adjustments to target new viral variants.
- Beyond COVID-19, ongoing clinical trials explore mRNA-based vaccines for diseases such as seasonal flu, herpes, respiratory syncytial virus, and more.

mRNA Applications in Disease Treatment:

- Expanding beyond vaccines, **mRNA holds promise in treating diseases like cancer.** Some mRNA cancer treatments operate as vaccines, **training the immune system to specifically target cancer cells.**
- By leveraging the mutational landscape of cancer cells, mRNA cancer vaccines can be personalized to match individual patients' specific cancer mutations.
- Clinical trials employing personalized mRNA approaches for cancers like pancreatic cancer are currently underway.
- The **potential applications of mRNA-based medicine extend to various diseases where correcting protein synthesis holds the key to effective treatment.**
- Ongoing research explores the use of mRNA in **heart disease, neurodegenerative disorders, bone loss, and other conditions, offering hope for future protein replacement therapies.**

mRNA-Based Medicine: The Future Landscape

- The future holds promise for treating diseases arising from **incorrect protein synthesis.**
- Early studies show encouraging signs in areas such as **wound healing for diabetic patients and addressing rare genetic disorders like propionic acidaemia.**
- The ability to easily customize and produce mRNA positions it as a transformative force in **personalized medicine.**
- With ongoing advancements and a deeper understanding of mRNA's capabilities, this technology stands poised to revolutionize medical treatments, offering **effective and tailored therapies with fewer side effects.**

Topic 22. WHAT IS 'NOMA', THE LATEST ADDITION TO WHO'S LIST OF NEGLECTED TROPICAL DISEASES

Important for the subject: Science and technology

The **WHO** recently acknowledged **noma**, a severely debilitating **oral and facial gangrenous disease**, as an **official neglected tropical disease (NTD)** due to its dire impact and historical neglect.

Noma eats away facial tissue and bones if not treated early. Also known as **cancrumoris** or **gangrenous stomatitis**, **noma** primarily affects **impoverished children aged 2-6** in **poor communities**, linked to **extreme poverty**, **malnutrition**, and **inadequate hygiene**. It has a **mortality rate** of approximately **90 per cent**.

Noma is prevalent in **sub-Saharan Africa**, predominantly affecting children in impoverished settings. **Noma was prevalent in the past** but largely **vanished from the Western world** with improved living conditions. It was even noted in **World War II concentration camps**.

- Noma begins with **gum inflammation**, caused by **bacteria** in the **mouth**, and rapidly progresses into **extensive tissue destruction** and **bone damage** if untreated.
- Scarce data exists on current cases, with estimates dating back to **1998**, reflecting the **disease's hidden nature**.
- **Early detection is crucial** as therapy **effectiveness diminishes in later stages**. Basic hygiene, antibiotics, and nutrition rehabilitation slow its spread, but access to adequate treatment remains a challenge due to poverty.
- **Survivors face severe consequences** such as **facial disfigurement**, **muscle spasms**, **speech problems**, and **oral incontinence**, compounding the challenges posed by extreme poverty.
- **Inclusion in the WHO's NTD list aims to raise awareness**, **drive research**, **secure funding**, and **implement comprehensive strategies** to combat the disease's devastating impact, especially in underserved communities.

Topic 23. JN.1 COVID SUB-VARIANT CASES ON RISE: ALL YOU NEED TO KNOW AS WHO ISSUES ALERT

Important for the subject: Science and technology

A new **JN.1 COVID sub-variant** is on the **rise**. **Respiratory diseases** are increasing around the world due to a number of pathogens including COVID19, flu, rhinovirus, mycoplasma pneumonia & others.

- SARS-CoV-2 continues to evolve. **JN.1 (subvariant of BA.2.86)** is already a **Variant of Interest (VOI)** and continues to increase in circulation.

JN.1 variant of COVID:

- It is considered the **Omicron subvariant BA.2.86** or **Pirola**. This variant was **first detected** in September 2023 in the **United States**.
- It is **capable of spreading faster and evading immunity**. It is a **severely immune-evasive** and **fast-spreading variant**, markedly different from **XBB** and all other prior versions of this virus.

- This enables it to infect people who had previous Covid infections and also people who were vaccinated.

Classification of Variants by CDC:

Variant of Interest (VOI):

- **Characteristics:** Variants with specific genetic markers linked to changes in receptor binding, reduced neutralization by antibodies, potential diagnostic impact, or increased transmissibility/severity.
- **Example:** **B.1.617 variant** with mutations **E484Q** and **L452R**, identified in **India**, classified as **VOI** by **WHO**.

Variant of Concern (VOC):

- **Traits:** Variants showing evidence of increased transmissibility, severe disease, reduced neutralization by antibodies, vaccine/treatment effectiveness, or diagnostic failures.
- **Examples:** 1.1.7 (UK), B.1.351 (South Africa), P.1 (Brazil), B.1.427, and B.1.429 variants in the US.

Variant of High Consequence:

- **Definition:** Variants drastically reducing the effectiveness of preventive measures or medical countermeasures.
- **Status:** No variants of high consequence reported circulating in the US by CDC.

Variants Under Investigation (VUI):

- **Criteria:** Variants with potential epidemiological, immunological, or pathogenic properties warrant formal investigation.
- **Status:** Variants emerging from the **1.617 lineage** currently designated as **VUI** by Public Health England (PHE).

Topic 24. HOST'S LAST MINUTE WITHDRAWAL LEAVES HISTORIC SCIENCE CONGRESS IN THE LURCH

Important for the subject: Science and Technology

A month after announcing that it would host the **109th edition of the Indian Science Congress**, the Jalandhar based **Lovely Professional University (LPU)** has backed out.

What is the India Science Congress?

- With a history dating back to 1914, the Science Congress is a one-of-its-kind event in the country.
- It **brings together scientists and researchers not just from the premier institutions**

and laboratories but also science teachers and professors from colleges and universities.

- It offers a platform for their interaction with students and the general public on matters related to science.
- It is a celebration of Indian science that has had an illustrious past, with the who's who of Indian science participating and organizing. The first session of the Indian Science Congress was held in 1914.

Organiser:

- It is organized by **Indian Science Congress Association (ISCA)**.
- ISCA is an independent body functioning **with the support of the Department of Science and Technology (DST) in the central government.**

Decline of Science Congress:

- In more recent times, the event has attracted attention for all the wrong reasons:
- Lack of serious discussion, the promotion of pseudoscience, outlandish claims by random speakers, and the absence of useful outcomes.
- As a result, several top scientists have advocated the discontinuation of the event, or at least withdrawal of government support.
- For organising the Science Congress, the government provides an annual grant. Besides this, the government has no role to play in organising the ISC.

Topic 25. TAX 'HFSS' FOODS, VIEW IT AS A PUBLIC HEALTH IMPERATIVE

Important for the subject: Science and Technology

India's Dietary Shift:

India, a major producer and consumer of sugar, has seen a sharp rise in high-fat sugar-salt (HFSS) food consumption.

- The **processed food industry** consumes **50%-60%** of produced sugar, salt, and fat. Sales of snacks and soft drinks exceeded **\$30 billion**, indicating concerning dietary trends impacting health and the economy.

Global Health Risks:

- Consumption of **HFSS foods** is a major contributor to **health problems** like **obesity, diabetes, and high blood pressure.**
- The **World Bank's 2019 report** highlighted that **70%** of overweight individuals live in **Low- and Middle-Income Countries (LMICs)**, with a **55% increase** in rural areas.

- **India's Non-Communicable Diseases (NCDs) burden has surged from 38% in 1990 to 65% in 2019, causing 1.2 million annual deaths due to dietary risks alone.**
- The economic impact was estimated at **\$23 billion in 2017**, projected to reach **\$480 billion by 2060** if unaddressed.

Global Trends in HFSS Taxation:

- Many countries are using **fiscal measures like taxation to combat obesity**. While **sugar-sweetened beverage (SSB) taxes** are common, **HFSS food taxes** are gaining traction.
- Countries like **Denmark, France, Mexico, and the UK** have implemented dedicated taxes, setting models for others.
- India experimented with a **'fat tax' in Kerala in 2016**, later absorbed into the **Goods and Services Tax (GST) in 2017**.

Justification for HFSS Taxation:

- HFSS consumption creates **societal costs in increased healthcare expenses and internal harm** due to **limited consumer understanding influenced by aggressive marketing**.
- Taxes serve as a targeted tool to **reduce detrimental habits**, proven effective in reducing the **purchase of unhealthy items** in various nations.

Purpose of HFSS Tax:

- Unlike **revenue-raising taxes** like those on **tobacco or alcohol**, **HFSS taxation aims to incentivize industry reformulation towards healthier alternatives** and encourage individuals to opt for **healthier diets**.
- Properly designed, these taxes can be **non-regressive and fiscally neutral**. The current **GST rates on ultra-processed foods don't consider nutritional content**, applying uniform taxes regardless of varying impacts. This oversight limits the shift towards healthier alternatives.

Public Health Imperative:

- **HFSS taxation in India** should be viewed beyond economics—it's a **public health necessity**.
- Effective taxes can deter **HFSS consumption**, promote **healthier choices**, drive **food reformulation**, improve **public health**, reduce **healthcare burdens**, and contribute to a **sustainable food system** when combined with **nutrition education** and **effective labelling**.

Key terms:

- **High Fat Sugar Salt foods (HSSF)** are known for their **negative impact on health**. A **negative externality** is something that impacts a person or people who are uninvolved

in a situation. Example: **Smoking cigarettes** or **burning coal**.

- **Internalities:** Harm caused to individuals due to limited understanding influenced by marketing.
- **Non-regressive Tax:** A tax that does not disproportionately burden lower-income individuals.

Topic 26. INDIA'S DEFENCE BUDGETING AND THE POINT OF DETERRENCE

Important for the subject: Science and Technology

To have India's defence Budget and national security goals examined through the prism of electoral imperatives would be unprofessional.

- With India in election mode and sops being showered on the electorate (even more certain before the general election in 2024), the allocation for defence in Budget 2024-25, which starts getting planned now, could take a hit. This could impact India's deterrence posture, which defence preparedness is all about.

Procurements

- The **Medium Multi-Role Combat Aircraft (MMRCA) programme of the Indian Air Force (IAF) earned the sobriquet of being the 'mother of all procurements'** due to its cost, pegged at around \$10 billion in 2007.
- A decade later, **the purchase of 36 Rafale jets was of limited value because the requirement was for 126 aircraft.**
- Consequently, many IAF chiefs have spoken of the depleting squadron strength in the IAF, which is now an abysmal 32.
- It would take another 10 years before it reaches 35 squadrons, as stated by the current IAF chief.

Need for judicious assessment

- The question is whether 'affordable defence' — due to the perennial guns versus butter dilemma — will be the driving factor. Or will **'affordable effectiveness' drive the defence Budget allocation?**
- This is best illustrated by the IAF going in for 97 more **Tejas Mk1A fighters to overcome the deficit in squadron strength**, though this was to be achieved by the 114 multi role fighter aircraft project that the IAF has been pushing for.
- The threat on the northern borders is a live one, and it would be unprofessional to dismiss our western neighbour's present benign stance as indicative of a lessening of risk.
- India needs to be prepared for both. **The imperativeness of a judicious assessment of**

how India plans to prosecute the next war could not be more pressing in these days of electoral one-upmanship.

- Enough has been written on the inescapable necessity of accretion in sea power to deter China in the environs of the Malacca Strait and further east, as also in the Indian Ocean.
- The Army needs to modernise too and, considering its size, the Budget requirement would be considerable.
- The planning and budgeting in the Indian military before the Russia-Ukraine war was for a short sharp conflict. The logistics design was to stock up on 10i (10 days intense) war, and build up to a 40i scenario.
- The refrain has changed, with the leadership of the armed forces now visualising an extended war scenario, as seen in Ukraine.

The indigenous drive: R&D

- It needs no reiteration that the armed forces should be technologically modern at any given time.
- However, developing a local defence industry takes decades, necessitating a smart balance to be maintained between imports and indigenous accretions to ensure the required potency.
- The Atmanirbhar Bharat public relations drive notwithstanding, a hard clinical view is required on the realities of the armament supply chain that would be in place in the near to mid-term.
- **India's defence Budget, in real terms, has been more or less stagnant.** Defence expenditure (revenue and capital), as a percentage of central government expenditure, has been declining — from around 16.4% in 2012-13 to 13.3% in 2022-23.
- The Ministry of Defence had asked for ₹1,76,346 crore in 2023–24 for capital acquisitions but only ₹1,62,600 crore was allotted, creating a deficit of ₹13,746 crore.
- In the sphere of research and development, the picture is not rosy either. **The Global Innovation Index 2022 pegs India's research and development expenditure at just 0.7% of its GDP which places it 53rd globally.**
- The government's emphasis on indigenisation through the **Innovations For Defence Excellence (iDEX) scheme and service-specific projects such as the Baba Mehar Singh competition for unmanned aerial vehicles by the IAF**, and similar ones in the other two services, are laudable.
- Similarly, the restructuring of the Ordnance Factory Board and promulgation of negative lists for imports instil confidence in the private sector for assured contracts.
- While all these are welcome, and the increase in defence exports heartening, it must be

accepted that this drive still has a long gestation period.

- The momentum should be sustained with a continuum in policy making and adequate defence budgeting by making them election-proof in our boisterous democracy — bipartisan statesmanship would be key in this endeavour.

Topic 27. COVID VACCINES PILLAR COVAX TO WIND DOWN BY YEAR-END LEFT WITH BILLIONS UNSPENT

Important for the subject: Science and Technology

COVAX mechanism, a worldwide initiative launched in April 2020 to ensure equitable access to **COVID-19 vaccines** is coming to an end from Dec 31, 2023.

COVAX mechanism:

- It was launched to make the **vaccines available equitably** and, more importantly, to **low-income countries** that otherwise would not be able to afford them. The vaccine distribution will shift to regular immunisation programmes.
- It was initiated by the **GAVI—the Vaccine Alliance**, the **Coalition for Epidemic Preparedness Innovations (CEPI)**, the **World Health Organization (WHO)** and the **United Nations Children’s Fund (UNICEF)**. **COVAX** is one of three pillars of the **Access to COVID-19 Tools (ACT) Accelerator**.
- This **ACT Accelerator** aimed to bring together governments, global health organisations, manufacturers, scientists, the private sector, civil society and philanthropy with the **goal** of providing innovative and equitable access to COVID-19 diagnostics, treatments, and vaccines.
- It helped **lower-income countries** achieve **57 per cent two-dose coverage**, compared to the **67 per cent global average**. The unspent funds of **COVAX** will be used by **GAVI**.
- **Burundi** in east Africa received the **least number of vaccinations**, with **0.32 per cent** of its population receiving at least one dose of a COVID-19 vaccine.
- **Yemen** (3.85 per cent), **Haiti** (5.73 per cent), **Papua New Guinea** (7.27 per cent), **Madagascar** (10.44 per cent) and the **Republic of the Congo** (13.93 per cent) were some of the other countries with the least number of vaccinations.

About Glocal Vaccine Alliance (GAVI):

- Founded in **2000**, it **aims** to improve access to vaccines in the world’s poorest countries. It operates through **collaborations with governments, WHO, UNICEF, the World Bank, vaccine manufacturers, and philanthropic foundations**.
- **Mission:** Its core goal is to save lives, reduce poverty, and protect against epidemics by enhancing vaccine access in lower-income nations.

- **Financial Mechanism:** Utilizes a financing model to provide affordable vaccines and support healthcare systems in recipient countries.
- **Impact:** Contributed significantly to increasing vaccination rates, reducing child mortality, and preventing the spread of diseases in developing nations.
- **COVID-19 Role:** Played a pivotal role in **COVAX**, ensuring **equitable COVID-19 vaccine access globally**, particularly for low- and middle-income countries.

CEPI:

- It was **established in 2017** to develop vaccines against emerging infectious diseases and epidemics.
- **Core Mission:** Aims to proactively tackle global health threats by accelerating vaccine development and ensuring equitable access to vaccines during outbreaks.
- It works in partnership with **public, private, philanthropic, and civil society sectors**, collaborating with organizations like **WHO** and **Gavi**.

Topic 28. CDSCO TO BAN COMMON COLD AND FLU SYRUPS FOR CHILDREN BELOW 4 YRS; PHARMA COS ASKED TO INSERT WARNING

Important for the subject: Science and Technology

The **Central Drugs Standard Control Organisation (CDSCO)**, the country's apex health regulatory agency, has decided to **ban the use of a popular anti-cold cocktail medicine combination** among **children below four years of age**.

Expert Committee Recommendation:

- In June, an expert committee discussed the matter and advised against using this drug combination for **children under four**.
- The committee suggested **adding a warning regarding this restriction on labels and package inserts**.

Reason:

- Some concerns have been raised over the **use of a fixed drug combination** of **Chlorpheniramine Maleate IP 2mg** and **Phenylephrine HCl IP 5mg drops**. The formulation was an **unapproved one for infants**.
- The combination is used to treat **cold and flu-like symptoms**, which include **coughing, sneezing, watery eyes**, among others. Makers of these medicines have been asked to insert a **'warning'**.

About CDSCO:

- Formed in **1961**, operates under **India's Ministry of Health and Family Welfare**.

Regulatory Scope and Functions:

- Oversees drugs, cosmetics, and medical devices' safety, efficacy, and quality as per the Drugs and Cosmetics Act.
- **Grants approvals for new drugs, licenses for manufacturing, and regulates clinical trials.**

Organizational Structure:

- Comprises expert committees focusing on drug approvals, adverse event monitoring, and policy formulation.

Quality Control and Inspections:

- Manages a **network of drug testing laboratories**, conducts facility inspections to ensure compliance with regulations.

International Collaborations:

- Collaborates with **global regulatory bodies and organizations** to align with **international standards and practices.**

Topic 29. INDIA'S AI MISSION*Important for the subject: Science and Technology*

In big AI push, Centre to step up compute capacity

As part of its **Artificial Intelligence Mission**, India **aims to develop its own "sovereign AI" by building computational capacity** in the country and offering **compute-as-a-service to start ups.**

- The plan involves a **public-private partnership** model and **government initiatives, with a goal of creating a digital public infrastructure (DPI)** for startups to utilize **computational capacity at a lower cost.**
- The initiative **aims to support AI applications in sectors like agriculture, healthcare, and education.**
- The government is also **working on building datasets and considering directing big tech companies to share anonymized personal data** with the **India Datasets platform.**

What is the Centre's Plan to Step up Compute Capacity under the AI Mission

- The **overall plan** includes:
- Establishing a **compute capacity** ranging from **10,000 to 30,000 GPUs**(graphic processing units) **under the PPP model.**
- Adding an extra **1,000-2,000 GPUs** through the **PSU Centre for Development of**

Advanced Computing (C-DAC).

- The government is **also considering diverse incentive structures** for **private firms to establish computing centers**, such as a **capital expenditure subsidy model** used in the **semiconductor scheme**, incentives based on operational expenses, and **offering a “usage” fee**.

How the Public Model for Building Computing Capacity will Work

- In the **public model**, **computational capacity will be established within the C-DAC** as a component of the **National Supercomputing Mission**.
- C-DAC **currently possesses the Rudra and Param systems**, with plans to integrate 1,000-2,000 GPUs to them.
- **Rudra, an indigenous server platform** developed by C-DAC, **features two expansion slots for graphic cards**.
- **Param Utkarsh**, a high-performance computing system at C-DAC, **provides AI capabilities across machine learning and deep learning frameworks**, along with **compute and storage services** as a cloud offering.

What is the Legal Framework Related to AI in India:

- In **India**, there are **currently no specific legal regulations** governing the **use of deepfake technology**.
- However, **existing laws can be applied to address the misuse of this technology**, covering aspects such as **Copyright Violation, Defamation, and cybercrimes**.
- For instance, the **Indian Penal Code**, which addresses **defamation**, and the **Information Technology Act of 2000**, which pertains to **sexually explicit material**, could **potentially be used** to combat malicious deep fake usage.
- **The Representation of the People Act of 1951** contains **provisions that prohibit the creation or dissemination of false or deceptive information** about candidates or political parties during election periods.
- Additionally, the **Election Commission of India** has established **regulations requiring registered political parties and candidates to obtain prior approval for all political advertisements on electronic media**.
- Despite these measures, **they may still be inadequate in fully addressing the multifaceted challenges arising from AI algorithms, including the potential risks associated with deep fake content**.

What are the Recent Global Efforts to Regulate AI:

- The world’s **inaugural AI Safety Summit**, hosted at **Bletchley Park** in the UK, saw **28**

major nations, including the US, China, Japan, the UK, France, India, and the European Union, unite in signing a declaration emphasizing the necessity for global action to address the potential perils of AI.

- The declaration **underscores the recognition of significant risks** stemming from potential deliberate **misuse and unintended control challenges** in advanced AI, particularly in **domains such as cyber security, biotechnology, and the spread of disinformation**.
- In response to these concerns, the **US President issued an executive order** aiming to **fortify defenses against AI-related threats and exercise regulatory oversight** over safety standards applied by companies in the assessment of **generative AI systems like ChatGPT and Google Bard**.
- During the **G20 Leaders' Summit held in New Delhi**, the **Indian Prime Minister advocated for the creation of a global framework governing the development of "ethical" AI tools**.
- This **shift in New Delhi's stance signifies a transition** from a position of **non-interference in AI regulation to a proactive approach, involving the formulation of regulations** grounded in a "risk-based, user-harm" perspective.

Topic 30. WHO PREQUALIFIES MALARIA VACCINE BY SERUM INSTITUTE

Important for the subject: Science and Technology

The World Health Organization (WHO) added the R21/Matrix M malaria vaccine, developed by Oxford University and manufactured by Serum Institute of India, to its list of prequalified vaccines. In October 2023, the WHO had recommended its use for the prevention of malaria in children.

About the R21/Matrix-M Vaccine:

- It is a **new vaccine approved for the prevention of malaria in children**.
- It was **developed by the University of Oxford and the Serum Institute of India with support from the European and Developing Countries Clinical Trials Partnership ('EDCTP'), the Wellcome Trust, and the European Investment Bank ('EIB')**.
- It is the first malaria vaccine to reach the WHO's target of **75% efficacy**. It has already been **approved for use in Burkina Faso, Ghana, and Nigeria**.
- The vaccine will be rolled out in those African countries in early 2024 and will be available in mid-2024 in other countries.

What is malaria?

- It is a **life-threatening disease** caused by parasites that are transmitted to people through

the bites of infected female *Anopheles* mosquitoes.

- There are 5 parasite species that cause malaria in humans, and 2 of these species, **Plasmodium falciparum** and **Plasmodium vivax**, pose the greatest threat.
- **Malaria is common in tropical areas where it's hot and humid.** Children under 5 years of age are the most vulnerable group affected by malaria.

Symptoms:

- The signs and symptoms of malaria are similar to flu symptoms.

They include:

- **Fever and sweating.**
- **Chills that shake your whole body**
- **Headache and muscle aches.**
- **Fatigue.**
- Chest pain, breathing problems, and cough.
- Diarrhoea, nausea and vomiting.
- As malaria gets worse, it can cause anemia and jaundice.
- The most severe form of malaria, which may progress to a coma, is known as **cerebral malaria**. This type represents about 15% of deaths in children and nearly 20% of adult deaths.

Treatment:

- It is **preventable and curable**. With early treatment, most people with malaria will make a full recovery.
- Some drugs are given in combination with other drugs. The type of parasite will determine the type of medication.

The **main antimalarial drugs** are:

1. chloroquine
2. hydroxychloroquine
3. primaquine
4. artemisinin-based therapy
5. atovaquone-proguanil

Topic 31. AS JN.1 EMERGES AS VARIANT OF INTEREST, TIME TO EVALUATE PREPAREDNESS

Important for the subject: Science and Technology

The identification of a sub variant — JN.1 — has sparked fresh interest in the epidemiological world, and has sounded the need for caution. The World Health Organisation, has decided, due to its rapid spread, to classify the **variant JN.1 as a separate variant of interest (VOI) from the parent lineage BA.2.86.**

About JN.1 Variant

- **Variant Lineage:** JN.1 is a sub-variant of BA.2.86, also known as **Pirola**, first detected in the United States in September and globally as early as January.
- **Mutation Characteristics:** While JN.1 has only one additional mutation on the spike protein compared to Pirola, its high number of spike protein mutations has drawn attention of researchers.

Possible Consequences of JN.1

- **Transmission and Severity:** Currently, there is no evidence suggesting that JN.1 causes more severe symptoms or spreads faster than other circulating variants.
- **WHO Assessment:** Both Pirola and JN.1 have been effectively neutralized by serum from infected and vaccinated individuals, according to the WHO Technical Advisory Group on COVID-19 Vaccine Composition.

Current Concerns and Global Spread

- **Increasing Cases:** A rise in cases caused by Pirola and JN.1 has been observed globally, including in the USA, Europe, Singapore, and China.
- **WHO Data:** JN.1 accounted for a significant proportion of **COVID-19 sequences in the GISAID database** and a notable percentage of variants in the United States.
- **Singapore's Situation:** Singapore reported a surge in COVID-19 cases, predominantly JN.1, with increased hospitalizations among older individuals.

Vaccination and Immunity in India

- **Hospitalization Risk:** Data from Singapore indicates higher hospitalization risks for those who received their last COVID-19 vaccine dose over a year ago.
- **Indian Immunity Levels:** Doctors suggests that widespread vaccination and exposure to COVID-19 have likely resulted in substantial immunity in India, reducing the need for updated vaccines. **Consistent Precautions:** Experts recommend standard **protective measures against respiratory viruses, including masking in crowded and enclosed spaces, staying in well-ventilated areas, and frequent hand washing.**

Topic 32. HOW AN AI TOOL CAN MAKE WEATHER FORECASTS MORE ACCURATE AND HELP TACKLE CLIMATE CHANGE

Important for the subject: Science and Technology

Watsonx.ai:

It is an **Artificial Intelligence (AI) tool** that will help users **monitor the Earth from space**, measuring **environmental changes** that have already happened while also making predictions about the future.

- Launched by **NASA** and **IBM** at the COP28 summit and available on the **open-source AI platform Hugging Space**.
- It can help scientists estimate the past and future extent of wildfires, floods, and urban heat maps.

How it works?

- It is similar to **Bing** and **Chat GPT**, it operates on a **foundation model** but uniquely incorporates **NASA's satellite image datasets instead of text**.
- **IBM** developed the model to interpret these visual datasets. **Training Process:** To teach the model to understand evolving visual sequences, scientists tasked it with filling in gaps in images, prompting it to reconstruct the missing parts.
- As it pieced together more images, the model improved in understanding their connections. It underwent adjustments for tasks like photo segmentation and categorization.
- It boasts **user-friendly simplicity**. Users can select a **location and date**, prompting the model to highlight changes in **floodwater levels, reforestation initiatives**, and other pertinent factors.

What will be its impact?

- **IBM's approach** could significantly **reduce data cleaning needs** and **accelerate geographical analysis** by **three to four times**, streamlining processes.
- The insights derived from this technology can **aid in mitigating flooding effects, infrastructure development, disaster response improvement, and environmental protection**.
- **Future integration of generative AI in weather forecasting** may lead to **more accurate predictions of hurricanes, droughts, and other catastrophic weather events**. It could shed light on how environmental changes, like polar ice melting, impact daily life.
- Businesses, disaster response teams, and logistics companies could benefit. This AI could help prepare for **housing-related fires, optimize supply chain logistics, and understand**

broader weather patterns.

How AI has helped in weather forecasting?

- Accessing and analyzing the vast and growing climate data sets pose significant hurdles. By 2024, an estimated 250,000 terabytes of climate data will be available, necessitating time-consuming analysis.
- The use of AI, particularly deep-learning models like AI emulators, aids in interpreting these complex data sets.
- European Center for Medium-Range Weather Forecasting has begun employing AI emulators to generate forecasts based on historical weather patterns.
- These models can infer weather patterns from data, enabling quicker desktop-based forecasts, and bypassing the time-consuming processes of traditional systems.
- AI integration streamlines data interpretation, potentially reducing forecasting time from hours to minutes, offering a promising approach to handle the increasing volume of climate data for informed decision-making in weather forecasting.

AI and Climate Change:

- AI-powered vehicles have the potential to minimize energy consumption by identifying optimal routes, thus reducing environmental impact.
- AI aids farmers by optimizing crop irrigation, cutting water wastage by 40%, and enhancing harvest productivity, as demonstrated by a 30% increase in yields among AI-equipped peanut farmers in India.
- AI's potential extends to assessing, reducing, and mitigating emissions at both macro and micro levels, potentially cutting an organization's carbon footprint by 5-10%.

Topic 33. MALDIVES WILL NOT RENEW AGREEMENT FOR JOINT HYDROGRAPHIC SURVEY WITH INDIA

Important for the subject: International Relations

The Maldives cabinet has decided against renewing a 2019 MoU with India for hydrographic surveying.

- India had “agreed” to Maldivian demand that Indian troops be withdrawn from the Indian Ocean Island nation.

Maldives considers it is an infringement on Maldivian sovereignty.

- So far, three joint hydrographic surveys have been undertaken – in 2021, 2022, and 2023.

- The **Indian Naval Ship (INS) Darshak** carried out the **first Joint Hydrographic survey** in February and March of 2021, second by **INS Sutlej** and third by **INS Investigator**.

Hydrographic surveys:

- Following the **2019 agreement**, the **Maldives National Defence Force (MNDF)** and the **Indian Navy** have carried out **three joint hydrographic surveys**.
- **Hydrographic surveys** are carried out by **ships**, which use **methods** such as **sonar** to understand the various features of a water body.
- These surveys help “**map out water depth, the shape of the seafloor and coastline, the location of possible obstructions, and physical features of water bodies**”, to ensure the efficiency and safety of maritime transportation.
- The surveys will generate updated **navigational charts/electronic navigational charts** that would **enhance the navigational safety of ships and enhance the Blue Economy of Maldives**.

Does India have such water survey pacts with other countries as well?

- In **2021**, India’s oldest **Hydrographic Survey ship, INS Sandhayak**, was decommissioned.
- It undertook more than **200 major hydrographic surveys** along the **Western and Eastern coasts** of the **Indian peninsula**, and the **Andaman Sea**, as well as surveys in neighbouring countries including **Sri Lanka, Myanmar, and Bangladesh**.
- A **UN study** says that approximately **50 per cent of coastal states have no hydrographic capability** and **another 25 per cent have only limited capabilities**.
- **Only the remaining 25 per cent, including India, have adequate hydrographic capabilities**.

Topic 34. BHUTAN TO HAVE 1000-SQ. KM. GREEN CITY ALONG ASSAM BORDER ‘CONNECTING SOUTH ASIA TO SOUTHEAST ASIA’

Important for the subject: International Relations

Gelephu Smart city Project:

Bhutan’s King Jigme Khesar Namgyel Wangchuck announced plans for an “**international city**” on a **1,000+ sq. km. area** bordering **Assam**, at the **Changlimathang stadium** in **Thimpu**.

- This **Economic Corridor** aims to connect **South Asia** with **Southeast Asia** via **India’s northeastern states** and will **enhance the connectivity**.

- **Infrastructure Development:** Includes **India-Bhutan railway line to Gelephu**, linking roadways, trading points, and connections to **Myanmar, Thailand, Cambodia, and Singapore.**

Project Details:

- Focus on environmental standards, sustainability, zero-emission industries, a mindfulness city, and infrastructure development.
- **Gelephu project** will have a distinct administrative region under different laws to attract international investment.
- **India has committed to improving roads, connecting border towns with railways, and supporting Bhutan's development.**

Impact on Bhutan:

- This mega project is considered to be a **'point of inflexion'** and **'transformation'** for **Bhutan and South Asia.**
- Anticipation among citizens for **job creation and economic opportunities**, especially for the youth. It will mark **Bhutan's international presence.**

Topic 35. THE STORMY RED SEA, THE COMPLEXITIES OF GLOBAL EVENTS

Important for the subject: International Relations

The Israel-Hamas war has opened a new front in the Red Sea, which will impact Asian economies.

Various Global Tensions

- **Escalation of Tensions:** At the end of October, a bold terror attack by Hamas against Israel disrupted regional stability, **drawing the Yemen-based Houthi militia into the conflict.**
- **Red Sea's Strategic Significance:** The announcement of Houthi involvement brought the critical Red Sea into the heart of the conflict, **posing a threat to the Suez Canal, a vital artery for nearly 15% of global trade.**
- **Houthi Aggression at Sea:** In mid-November, the Houthis raided a cargo vessel with reported Israeli links in the Red Sea, showcasing their military capabilities and escalating tensions.

Global Response

- **US Military Deployment:** The United States has taken a leading role, deploying military assets to counter Houthi threats, including drones, missiles, and direct operations.
- **Multinational Task Force:** In response to increasing incidents, the U.S. calls for a

multinational task force in the **Bab al-Mandab Strait**, a crucial passage connecting **Yemen, Djibouti, and Eritrea**.

- **Saudi Arabia's Dilemma:** Despite the on-going conflict with the Houthis in Yemen, Saudi Arabia urges restraint by the U.S., signaling a complex geopolitical landscape.
- **Saudi-Iran Détente:** Surprisingly, talks between Saudi Arabia and the Houthi leadership have emerged following a Saudi-Iran detente brokered by China.
- **China's Diplomatic Role:** Arab response to the Gaza crisis indicates positive sentiments toward China, particularly due to its balanced stance compared to the unequivocal support given by the U.S. to Israel.

Global Impact on Asian Economies

- **Security Depletion in the Red Sea:** The global ramifications of security deterioration in the Red Sea extend to Asian economies such as India, Japan, South Korea, and China.
- **Persian Gulf Dynamics:** India, Japan, and South Korea navigate diplomatic channels in dealing with tensions in the Persian Gulf, each having specific interests and concerns.

Mobilizing Global Partners

- **US Call for Action:** Reflecting on past multilateral efforts against piracy, the U.S. calls for partners to mobilize, recognizing the necessity of a collective response.
- **Stakeholders in West Asian Security:** India, Japan, and South Korea, as net importers of oil and gas, emerge as stakeholders in West Asian security, underlining their strategic and kinetic interests.

Non-State Actors' Growing Influence

- **Shifting Geopolitical Order:** As the global geopolitical landscape evolves, the rise of non-state militant actors becomes a crucial factor, often aligned with state interests for short-term gains and long-term strategic victories.

Topic 36. WHAT LED TO THE COUP ATTEMPT IN SIERRA LEONE?

Important for the subject: International Relations

On November 26, unidentified gunmen attempted a coup in Sierra Leone, targeting military barracks, police stations, and correctional centers.

What is happening in Sierra Leone?

- In August 2023, the Sierra Leone police arrested several individuals, including senior military officers, accused of planning violent attacks on government institutions.
- The recent attacks aimed to free the arrested military officers and were declared an

unsuccessful coup attempt by the government.

- **Political instability is a key factor**, intensified by President Julius Maada Wonie Bio's **contested re-election and the opposition's boycott of parliament**.
- **Economic instability, marked by a high cost of living, severe poverty, and a 50.94% inflation rate in August, contributes to unrest**.
- **President Bio's economic policies worsened the crisis**, leading to protests demanding his resignation in July and August 2022. Police aggression, seen in incidents like the 2020 prison riot and the August 2022 protests, fuels resentment toward the government.

Measures to End Resentment

- The state response includes an **indefinite curfew, flight rescheduling**, cash rewards for information on coup leaders, and ongoing security operations.
- **Sierra Leone is a member of the Economic Community of West African States (ECOWAS), and ECOWAS intervention may occur to maintain constitutional order**.
- ECOWAS has a **history of intolerance toward unconstitutional takeovers** and may impose sanctions on Sierra Leone if a coup attempt succeeds.

Some facts about Sierra Leone

- Sierra Leone, officially the Republic of Sierra Leone, is a **country on the southwest coast of West Africa**.
- The country is **bordered by Guinea to the north and east, Liberia to the southeast, and the Atlantic Ocean to the west and southwest**.
- The country's capital, Freetown, was founded as a settlement for freed slaves in the late 18th century. **Temne and Mende are the largest ethnic group of Sierra Leone**.
- The country is **rich in natural resources, especially diamond, gold, bauxite and aluminum**.
- Sierra Leone has one of the **world's largest deposits of rutile, a titanium ore used as paint pigment and welding rod coatings**.

Topic 37. MIGRANT VESSEL CAPSIZED OFF LIBYA

Important for the subject: International Relations

Over 60 drown in a migrant vessel off Libya while trying to reach Europe. A boat **carrying 86 migrants capsized off the coast of Libya**, resulting in the tragic **death of over 60 people**, including women and children.

The incident **occurred near the town of Zuwara on Libya's western coast**, with strong

waves causing the boat to capsize.

- The UN's **International Organization for Migration (IOM)** reported the shipwreck, emphasizing the perilous nature of the central Mediterranean route, one of the world's most dangerous migration paths.
- Libya has become a major transit point for migrants fleeing conflict and poverty in Africa and the Middle East, and the central Mediterranean is a deadly route for those seeking entry into Europe.
- The region has **witnessed thousands of deaths**, with over 2,250 fatalities reported on this route in the current year alone.

Some facts about International Organization for Migration (IOM)

- IOM is an **intergovernmental organization** that provides **services and advice concerning migration to governments and migrants**, including refugees, internally displaced persons and migrant workers.
- IOM was established in **1951 as Inter governmental Committee for European Migration (ICEM)** to help resettle people **displaced by World War II**.
- It was granted Permanent Observer status to the UN General Assembly in 1992. **Cooperation agreement between IOM and the UN was signed in 1996.**
- The **World Migration Report** is published every year by the International Organization for Migration (IOM) of the UN.

IOM works in four broad areas of migration management:

- **Migration and development, Facilitating migration, Regulating migration and Forced migration.**
- It has **175 member states**, a further **8 states holding observer status** and offices in over 100 countries.
- **India is a member of IOM.**

Some facts about Libya:

- Libya is a **country in the Maghreb region** of North Africa.
- It borders the **Mediterranean Sea to the north, Egypt to the east, Sudan to the southeast, Chad to the south, Niger to the southwest, Algeria to the west, and Tunisia to the northwest.**
- **Tripoli is the capital of Libya.** Libya had the **largest proven crude oil reserves in Africa.**

Topic 38. US ANNOUNCES 10-NATION FORCE TO COUNTER HOUTHI ATTACKS IN RED SEA

Important for the subject: International Relations

The U.S. and several other nations have initiated a new force, **Operation Prosperity Guardian**, to protect ships in the Red Sea that are under attack by drones and ballistic missiles from Houthi-controlled areas of Yemen.

- The attacks have led to shipping companies ordering their vessels to hold in place. The new multinational security initiative aims to provide collective action against the attacks.
- **Operation Prosperity Guardian** will not necessarily escort specific vessels but will offer **umbrella protection** to as many ships as possible in the southern Red Sea.
- The U.K, Bahrain, Canada, France, Italy, Netherlands, Norway, Seychelles, and Spain have joined the maritime security mission.
- China, despite having warships in the region, is notably **absent**. The new initiative will be coordinated by the existing **Combined Task Force 153**, established in April 2022 to enhance maritime security in the region.
- The U.S. has also called on the **United Nations Security Council** to take action against the Houthi attacks on commercial vessels.

What is Combined Task Force 153:

- **Combined Task Force 153 (CTF 153)** is a task force that focuses on maritime security and capacity building in the Red Sea, Bab al-Mandeb, and Gulf of Aden.
- It was established on April 17, 2022, and is one of five task forces operated by the **Combined Maritime Forces (CMF)**

What is Combined Maritime Forces (CMF):

Who are the Houthis:

- The Houthis are a large **Zaidi Shia** clan that began a movement against the dictatorship of **Ali Abdullah Saleh** in the 1990s.
- Today, they are a faction in the bloody civil war that has raged in Yemen since 2014. The Houthis are backed by **Iran** and control territory in the west and northwest of Yemen, including the capital **Sana'a**.
- They are fighting against the **Sunni-led internationally recognised Yemeni government**, backed by **Saudi Arabia** and the **UAE**.

Topic 39. THE DONKEY ROUTE

Important for the subject: International Relations

What is Donkey Route:

The “donkey route” to the United States involves migrants traveling through Latin American countries to reach the US border.

- The journey often starts in countries like Ecuador, Bolivia, or Guyana, where Indian citizens can obtain visas easily.
- The route includes crossing the dangerous Darién Gap, a forested area between Colombia and Panama, facing risks such as lack of clean water, wildlife, and criminal gangs.
- From Panama, migrants are often routed through Guatemala to enter Mexico and eventually reach the US border, facing challenges like jumping fences and crossing the Rio Grande river.
- The journey is expensive, ranging from Rs 15 lakh to Rs 70 lakh, and involves coordination with human trafficking networks. Agents in India collaborate with traffickers along the entire route to the US.
- Despite the dangers, many migrants continue to take this perilous journey in pursuit of the American Dream.

Topic 40. BENGALURU AIRPORT WINS AWARD AT UNESCO’S 2023 PRIX VERSAILLES

Important for the subject: International Relations

Terminal 2 (T2) of Kempegowda International Airport (KIA) in Bengaluru has been recognised as one of the world’s most beautiful airports and awarded the special prize for interiors at the UNESCO’s 2023 Prix Versailles.

About PRIX VERSAILLES

- Announced each year at UNESCO since 2015, the Prix Versailles is a series of architectural competitions that shine a light on the finest contemporary projects worldwide.
- At the intersection between multiple disciplines, the members of the Prix Versailles World Jury are tasked with awarding twenty-four World Titles from among the ninety-six projects named Selected Sites (in the categories of Airports, Campuses, Passenger Stations and Sports) or Continental Laureates (in the categories of Shops & Stores, Shopping Malls, Hotels and Restaurants).

- The Official List – which **pays tribute to innovation, creativity, reflections of local heritage, ecological efficiency and the values of social interaction and participation, which the United Nations holds in high regard – is in line with the principles of intelligent sustainability**, taking the projects’ ecological, social and cultural impacts into consideration.

Some More Accomplishments of Bengaluru International Airport:

- Earlier, Terminal 2 of the Bengaluru International Airport received the prestigious **IGBC platinum certification from the Indian Green Building Council under the IGBC Green New Building Rating system.**
- The Indian Green Building Council (IGBC) has launched IGBC Green New Buildings rating system to address the National priorities.
- This **rating programme is a tool which enables the designer to apply green concepts** and reduce environmental impacts that are measurable. The rating programme covers methodologies to cover diverse climatic zones and changing lifestyles.
- Designed to accommodate 25 million passengers per annum in its first phase, T2 aims to blend functionality with aesthetic appeal, offering passengers an unforgettable experience through its insightfully curated art and decor elements.
- The sustainable design of T2, the **world’s largest terminal pre-certified with a platinum LEED rating by the US Green Building Council before operational commencement**, reflects the airport’s commitment to environmental responsibility.
- **LEED (Leadership in Energy and Environmental Design) is the world’s most widely used green building rating system.**
- LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits. LEED certification is a globally recognized symbol of sustainability achievement.

Topic 41. IF INFLATION IS NOT TAMED, THERE IS RISK TO CONSUMPTION AND GROWTH

Important for the subject: Economy

November’s resurgence in headline retail inflation, while clearly not unexpected after the RBI just last week predicted a likely ‘uptick’, is a stark reminder of the risks volatile food prices pose.

Rise in Consumer price index

- While the **National Statistical Office’s** provisional reading of headline inflation shows the Consumer Price Index rose by 5.55% year-on-year to a three-month high, from October’s 4.87%, food price gains measured by the **Consumer Food Price Index**

accelerated by a steep 209 basis points to 8.7% last month.

Why inflation is dangerous?

1. **Reduces the purchasing power leading to low consumption**
2. **Fall in savings**
3. **Fall in demand**
4. **Fall in investments**

What caused the rise?

- Propelling the **upsurge in food prices** were cereals and vegetables, constituents of the ‘**food and beverages**’ sub group, that logged **10.3% and 17.7% inflation, respectively**.
- **Cereals**, that account for almost one-tenth of the CPI and logged double-digit inflation for a 15th straight month, also saw a month-on-month acceleration in inflation with rice, wheat, and the coarse cereal of jowar, a rural hinterland staple, all registering palpable sequential price gains.
- **Vegetable prices were back on a boil** with the year-on-year inflation rate surging by almost 15 percentage points from October’s 2.8%.
- **While price gains in the perishable tomato swung** from two straight months of sizeable deflation to a more than 11% year-on-year rate of inflation last month, the extent of increase could be truly gauged from the fact that prices surged a steep 41% from the preceding month’s levels, as per data aggregated on the Centre for Monitoring Indian Economy’s website.
- And the key **masala essentials of ginger and garlic registered more than 100% rates of inflation** for the seventh and third months, respectively.

Major concern

- From the TOP or tomato, onion and potato triumvirate of India’s most widely consumed vegetables, **onion prices remained the biggest source of concern** as year-on-year inflation ballooned to 86%, from October’s 42% pace, and the sequential pace swelled to 48%.
- With reports that **inclement weather and depleting groundwater are likely to cause a near 25% shortfall in onion output** during the key rabi season, the outlook for prices of the nutrient-dense bulb moderating in the near future appears bleak, the government’s move to impose a ban on its exports notwithstanding.

Key Concept for Prelims

Consumer Price Index (CPI)

- A comprehensive tool for estimating **price changes in a basket of goods and services** that is representative of consumption expenditure in an economy is the

Consumer Price Index.

- One of the most significant economic statistics, it provides an estimate of the cost of living and is typically **based on the weighted average of commodity prices**.
- The amount of inflation during a given period, or the rise in the prices of a representative basket of consumed goods, is indicated by the percentage change in this index over time.
- **Four kinds of CPI are as follows:** CPI for Industrial Workers (IW), CPI for Agricultural Labourer (AL), CPI for Rural Labourer (RL), CPI (Rural/Urban/Combined).
- **The first three are compiled by the Labour Bureau in the Ministry of Labour and Employment. Fourth is compiled by the NSO in the Ministry of Statistics and Programme Implementation.**
- Consumer Food Price Inflation is a specific measure of inflation that focuses exclusively on the price changes of food items in a consumer's basket of goods and services.
- **It calculates the rate at which the prices of food products consumed by the average household are increasing over time. CFPI is a sub-component of the broader Consumer Price Index (CPI).**

Topic 42. GOVT. ALLOWS USE OF CANE JUICE, B MOLASSES TO MAKE ETHANOL

Important for the subject: Economy

In a U turn, the Centre reversed its decision to ban the use of sugarcane juice for making ethanol as it allowed utilisation of the juice as well as B-heavy molasses to produce the green fuel but capped the diversion of sugar at 17 lakh tonnes.

About Ethanol:

- Ethanol, also known as ethyl alcohol, is a **biofuel produced from various sources such as sugarcane, corn, rice, wheat, and biomass**.
- The production process involves the **fermentation of sugars by yeasts or via petrochemical processes such as ethylene hydration. Ethanol is 99.9% pure alcohol** that can be blended with petrol to create a cleaner fuel alternative.
- Apart from being a fuel additive, ethanol production yields **valuable byproducts like Distillers' Dried Grain with Solubles, and Potash from Incineration Boiler Ash that find applications across various industries**.

Ethanol production in India:

- **Ethanol production in India was mainly based on 'C-heavy' molasses, with a sugar content of 40-45%, yielding 220–225 liters of ethanol per tonne.**
- India explored direct sugarcane juice for ethanol production, increasing yield and

efficiency. The **country diversified its feed stocks by including rice, damaged grains, maize, jowar, bajra, and millets.**

- **Ethanol yields from grains are higher compared to molasses**, with rice producing 450-480 liters and other grains 380-460 liters per tonne.
- Sugar mills diversified to use rice, damaged grains, maize, and millet as feedstocks. Leading sugar companies installed distilleries that can operate on multiple feedstocks throughout the year.

Types of Molasses:

- **A Molasses (First Molasses):** An intermediate by-product from initial sugar crystal extraction, containing 80-85% dry matter (DM). Should be inverted to prevent crystallization if stored.
- **B Molasses (Second Molasses):** Similar DM content as A molasses but with less sugar and no spontaneous crystallization.
- **C Molasses (Final Molasses, Blackstrap Molasses, Treacle):** The end by-product of sugar processing, containing significant amounts of **sucrose** (about 32 to 42%). It does not crystallize and is used as a commercial feed ingredient in liquid or dried form.

Government Initiatives to Promote Ethanol Blending in India:

National Policy on Biofuels 2018

E100 Pilot project

Pradhan Mantri JI-VAN Yojana 2019

Repurpose Used Cooking Oil (RUCO)

Topic 43. A.P. GUJARAT, T.N. NAMED 'ACHIEVERS' IN CENTRE'S LOGISTICS REPORT

Important for the subject: Economy

As many as 11 States and two Union Territories, including the coastal States of Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu; landlocked States Haryana, Punjab, Telangana, Uttar Pradesh; North Eastern States Assam, Sikkim, Tripura and UTs Chandigarh, Delhi have been named as 'Achievers' in the LEADS [Logistics Ease Across Different States] 2023 report released by Union Minister Piyush Goyal.

About LEADS Report:

- The LEADS is an **indigenous data-driven index** to assess logistics infrastructure, services, and human resources across all 36 States and UTs.
- LEADS continues to act as a **guiding & bridging mechanism for the identification of interventions enhancing logistics efficiency at State/UTs.** It reflects positively on

international indices, like **Logistics Performance Index**.

- The **first logistics report was released in 2018**.

Three performance categories namely:

- **Achievers:** States/UTs achieving 90% or more percentage.
- Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu; landlocked States Haryana, Punjab, Telangana, Uttar Pradesh; North Eastern States Assam, Sikkim, Tripura and UTs Chandigarh, Delhi have been named as ‘Achievers’ in the LEADS.

Maharashtra tops amongst the “Achievers” states.

- **Fast Movers:** States/UTs achieving percentage scores between **80-90%**.
- **Aspirers:** States/UTs achieving percentage scores below 80% have been made.
- **The LEADS 2023 survey report would assist PM Gati-Shakti National Master Plan (PMGS-NMP) and National Logistics Policy (NLP) to mapping of logistics infrastructure, services, and regulatory environment enabling State Governments to identify and fill the gaps and achieve data-driven multimodal connectivity.**
- PMGS-NMP has potential to save over Rs. 10 Lakh Crore annually by improving logistics efficiency and will bring down the logistic cost to single digits in the coming years.

What is the Logistics Performance Index?

- The Logistics Performance Index (LPI), developed by the World Bank Group, is an **interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics** and what they can do to improve their performance.

LPI is the weighted average of the country’s scores on the six key dimensions:

- Efficiency of the clearance process (i.e., speed, simplicity and predictability of formalities) by border control agencies, including customs.
- Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology). Ease of arranging competitively priced shipments.
- Competence and quality of logistics services (e.g., transport operators, customs brokers). Ability to track and trace consignments.
- Timeliness of shipments in reaching destinations within the scheduled or expected delivery time.

What are the Initiatives Related to Logistics?

1. Multimodal Transportation of Goods Act, 1993.

2. PM Gati Shakti Scheme
3. Multi Modal Logistics Parks
4. LEADS Report
5. Dedicated Freight Corridor
6. Sagarmala Projects
7. Bharatmala Project

Topic 44. RECONSTITUTION OF NATIONAL START-UP ADVISORY COUNCIL

Important for the subject: Economy

The National Start-up Advisory Council (NSAC) has been reconstituted by the Indian government. **31 non-official members have been nominated for the NSAC**, representing various stakeholders in the startup ecosystem.

- Non-official members include **founders of successful start-ups, veterans with experience in scaling companies, individuals representing the interests of startup investors, and representatives from associations.**
- Notable individuals nominated include **Abhiraj Singh Bhal from Urban Company and Kunal Bahl from Snapdeal.** The term of non-official members is **typically two years.** The reconstitution follows the completion of the initial term.
- The NSAC serves as an advisory body to the government, providing guidance on measures to strengthen the innovation and startup ecosystem in India. The Department for Promotion of Industry and Internal Trade (DPIIT) had originally constituted the council in January 2020.
- The council suggests measures to **foster a culture of innovation, particularly among citizens and students.** It also aims to promote innovation across all sectors of the economy, including semi-urban and rural areas.
- The eighth meeting of the NSAC is scheduled to take place under the chairmanship of the Commerce and Industry Minister on December 19. The council meets regularly to discuss and recommend initiatives that contribute to the growth and development of the startup ecosystem in the country.
- **Presidents of industry chambers like CII (Confederation of Indian Industry) are also part of the NSAC, providing a holistic perspective.** One of the council's objectives is to **promote innovation not only in urban areas but also in semi-urban and rural regions, ensuring a broader impact.**
- In summary, the reconstitution of the NSAC reflects the government's commitment to fostering innovation and supporting the startup ecosystem in India. **The diverse representation of stakeholders contributes to a comprehensive approach in**

addressing challenges and promoting growth in the startup sector.

National Startup Advisory Council (NSAC):

- The NSAC was **constituted by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Union Ministry of Commerce and Industry.**
- The primary objective of NSAC is to advise the Government on measures **aimed at building a robust ecosystem for nurturing innovation and startups.** The ultimate goal is to drive sustainable economic growth and generate significant employment opportunities.

Composition:

- **Chairman:** The council is chaired by the Minister for Commerce & Industry. **Ex-officio Members:** These include nominees from concerned Ministries/Departments/Organizations, not below the rank of Joint Secretary.
- **Non-official Members:** The council includes non-official members representing **various stakeholders, such as founders of successful start ups and veterans who have contributed to the growth and scaling of companies in India.**
- NSAC plays a crucial role in identifying areas for **intervention to expand the startup ecosystem. It engages in ideation and nurturing national programs under the Startup India initiative.**
- In summary, the National Startup Advisory Council is a key mechanism in driving the objectives of the Startup India initiative, aligning with the **government's vision to promote innovation, entrepreneurship, and economic growth in India.**

Start-up India Initiative:

- **Launch Date:** The Startup India initiative was launched in 2016.
- **Flagship Initiative:** **Startup India is a flagship initiative of the Government of India, to catalyze a startup culture and establish a strong, inclusive ecosystem for innovation and entrepreneurship in the country.**
- Startup India seeks to **provide support and encouragement to startups through various policy measures, incentives, and initiatives.** By nurturing startups, the **initiative aims to contribute to sustainable economic development and job creation on a large scale.**

Start up India Seed Fund Scheme (SISFS):

- The Startup India Seed Fund Scheme (SISFS) is an initiative by the Government of

India to provide financial assistance to startups in their early stages.

- The primary goal of SISFS is to **support startups by providing them with seed funding to help them kickstart their operations and contribute to their growth.**
- Under the scheme, **eligible startups receive financial assistance to meet their initial funding requirements, fostering a conducive environment** for their development.
- The government allocates funds to the Startup India Seed Fund Scheme **to facilitate the provision of financial support to qualifying startups.**
- Startups can utilize the funds for various purposes, **including product development, market entry strategies, proof of concept, prototype development, and other early-stage activities.**

Topic 45. RBI TIGHTENS NORMS FOR LENDERS INVESTING IN AIFS: KEY POINTS

Important for the subject: Economy

The Reserve Bank of India (RBI) has **tightened norms for lenders investing in Alternative Investment Funds (AIFs) to address concerns related to evergreening of stressed loans.**

Concerns Addressed:

- The central bank **aims to curb transactions involving the substitution of direct exposure of lenders to borrowers with indirect exposure through investments in AIF units, which may conceal the true status of stressed loans.**

Restrictions on Downstream Investments:

- **Lenders are prohibited from investing in any scheme of an AIF with downstream investments, either directly or indirectly, in a company that has borrowed from them in the preceding 12 months.**
- **If lenders have such investments, they must liquidate them within 30 days. Failure to do so requires them to make a 100% provision on such investments.**

Circular Applicability:

- The norms are part of the RBI's circular on 'Investments in AIFs,' **applicable to REs (Regulated Entities) i.e. commercial banks, urban cooperative banks, all-India financial institutions, and non-banking finance companies, including housing finance companies.**

Deduction from Capital Funds:

- Full deduction from the lender's capital funds is prescribed if they have investments in the subordinated units of any AIF scheme with a 'priority distribution model'.

Priority Distribution Model:

- Under this model, **certain AIF schemes have a distribution waterfall where one class of investors has priority in distribution over others, leading to a deduction from the lender's capital funds.**
- The tightening of norms follows RBI Governor Shaktikanta Das's mention of instances where **lenders used innovative methods to conceal the actual status of stressed loans.**
- Industry participants express concerns that the **circular makes it virtually impossible for RBI-regulated entities, especially banks and NBFCs, to invest in AIFs, reducing the pool of investable assets for AIFs.**
- Industry participants plan to seek further clarity from the RBI on the circular's implications and requirements.
- The RBI's move aims to enhance transparency and **prevent the misuse of AIF investments for concealing the true state of stressed loans by financial institutions.**

Upstream and Downstream Investment in Foreign Direct Investment (FDI):

- **Upstream Investment in FDI: Upstream FDI involves foreign investments in activities related to the early stages of the production process, such as exploration, extraction, and initial processing of raw materials or resources in a host country.**
- **Examples:** A foreign company investing in the exploration and extraction of natural resources (oil, minerals, etc.) in another country. Investment in agricultural activities, including farming or cultivation of raw materials.
- **Downstream Investment in FDI: Down stream FDI pertains to foreign investments in activities associated with the later stages of the production process, including processing, manufacturing, distribution, and marketing of finished products in a host country.**
- Foreign investment in manufacturing plants for converting raw materials into finished goods. Investment in retail chains, distribution networks, or marketing activities in a host country.

About AIFs:

- As per Securities and Exchange Board of India (Alternative Investment Funds) Regulations, 2012, **AIFs refer to privately pooled investment funds, either from Indian or foreign sources, in the form of a trust, company, body corporate, or Limited Liability Partnership (LLP).**
- **AIFs do not include funds covered under SEBI (Mutual Funds) Regulations, 1996, SEBI (Collective Investment Schemes) Regulations, 1999, or any other regulations of**

the Board regulating fund management activities.

Categories of AIFs:

- AIFs are **classified into three categories** based on their investment focus and activities.

Category I:

- Category I AIFs primarily invest in **start-ups, small and medium-sized enterprises (SMEs), or sectors deemed economically and socially viable** by the government.

Category II:

- Category II AIFs include **private equity funds or debt funds that do not receive any specific incentives or concessions from the government** or any other regulator.

Category III:

- Category III AIFs encompass **hedge funds or funds aimed at making short-term returns, along with open-ended funds that do not receive any specific incentives or concessions** from the government or any other regulator.

About Ever greening of Loans:

- Ever greening of loans refers to the practice **where banks or lenders provide additional funds or take other measures to artificially sustain a loan that is not being repaid as scheduled.**
- The primary objective is to **avoid classifying the loan as a non-performing asset (NPA)** which could necessitate setting aside more provisions for potential losses.

Purpose of Evergreening:

- Evergreening is a **temporary measure employed by banks to maintain the appearance of a performing asset, thereby safeguarding their profitability and financial stability.**

Risk Associated:

- While **ever greening loans may temporarily alleviate the stress on a bank's balance sheet, it can conceal the true extent of non-performing assets** and potentially lead to a more significant financial crisis if not addressed effectively.

Classic Ever greening

- Instances of **non-bank lenders selling stressed loans to AIFs partially set up by the lender itself, with the fresh funds being used to repay the original debt to prevent the loans from turning bad**, is “classic ever greening”.

Definition of Non-Performing Asset (NPA):

- NPA refers to a **classification for loans or advances that are in default or are in arrears on scheduled payments of principal or interest.**

Categories of Non-Performing Assets:

Sub-standard Assets:

- **Sub-standard assets are those classified as NPAs for a period less than or equal to 12 months.**

Doubtful Assets:

- **Doubtful assets are those that have been non-performing for a period exceeding 12 months.**

Loss Assets:

- **Loss assets are considered uncollectible, with little or no hope of recovery, and require complete write-off from the bank’s books.**

Topic 46. WHAT CAUSES INFLATION IN INDIA: DEMAND OR SUPPLY ISSUES?

Important for the subject: Economy

Typically, inflation in India is primarily influenced by factors related to supply but there are times when demand factors also play a significant role, according to an article published by the Reserve Bank of India as a part of their December bulletin.

What is Inflation?

- Inflation, as defined by the International Monetary Fund, is the **rate of increase in prices over a given period, encompassing a broad measure of overall price increases or for**

specific goods and services.

- It reflects the **rising cost of living and indicates how much more expensive a set of goods and/or services has become over a specified period, usually a year.**

What are the Different Causes of Inflation?

Demand-Pull Inflation:

- Demand Pull inflation occurs when the **demand for goods and services exceeds their supply.**
- When the overall demand in the economy is high, consumers are willing to pay more for the available goods and services, leading to a general rise in prices.
- A booming economy with high consumer spending can create excess demand, putting upward pressure on prices.

Cost-Push Inflation:

- **Cost-push inflation is driven by an increase in the production costs for goods and services.** This can be caused by factors such as increased incomes, increased costs of raw materials, or disruptions in the supply chain.
- For instance, (as per CPI data) inflation in ‘oils and fats’ in March, 2022 soared to 18.79% as the geopolitical crisis due to the Russia-Ukraine war pushed edible oil prices higher.

Built-In or Wage-Price Inflation:

- This type of inflation is often described as a feedback loop between wages and prices.
- **When workers demand higher wages, businesses may raise prices to cover the increased labor costs.** This, in turn, prompts workers to seek higher wages, and the cycle continues.
- Collective bargaining by labor unions can result in higher wages, leading to increased production costs and subsequently higher prices for goods and services.

Monetary Inflation:

- **Monetary inflation is often linked to an increase in the money supply in an economy.** When there is more money in circulation, consumers have more purchasing power, which can drive up demand and prices.
- Central banks printing more money or implementing policies that increase the money supply can contribute to monetary inflation.

Supply Shocks:

- **Supply shocks occur when there is a sudden and unexpected disruption to the supply of goods and services.** Natural disasters, geopolitical events, or other unforeseen

circumstances can lead to a reduction in supply, causing prices to rise.

- A drought affecting agricultural output can lead to a decrease in the supply of crops, causing food prices to spike.

Built-In Expectations:

- If people expect prices to rise in the future, they may adjust their behavior accordingly.
- This can create a self-fulfilling prophecy where businesses raise prices in anticipation of higher costs, and consumers, expecting further increases, may buy more now, contributing to inflation.
- If individuals believe that inflation will increase in the future, they may demand higher wages and businesses may raise prices in anticipation of increased costs.

What are the Impacts of Rising Inflation?

- **Inflation erodes the purchasing power of money**, meaning that with the same amount of money, individuals can buy fewer goods and services.
- Central banks often respond to **inflation by raising interest rates**. Higher interest rates can increase the cost of borrowing for businesses and individuals, potentially slowing down investment and economic growth.
- High or unpredictable inflation can create uncertainty in the economy. Businesses may find it challenging to plan for the future when prices are constantly changing.
- Persistent and high inflation can have social and political consequences. It may lead to public dissatisfaction, protests, and demands for wage increases.

Types of inflation include:

- **Deflation:** Deflation is the **opposite of inflation and refers to a sustained decrease in the general price level of goods and services**. It occurs when the supply of goods exceeds demand, leading to reduced prices.
- **Deflation can discourage spending, as consumers may delay purchases in anticipation of lower prices, which can further slowdown economic growth and potentially lead to recession.**
- **Hyperinflation:** Hyperinflation is an **extremely high and typically accelerating inflation**. It occurs when the price levels rise rapidly, eroding the value of the currency.
- This phenomenon often results from a collapse in the currency **and is detrimental to the economy, leading to a loss of confidence in the currency and undermining economic stability.**
- **Stagflation:** Stagflation is a situation characterized by a **combination of stagnant**

economic growth, high unemployment, and high inflation.

- It presents a challenge for policymakers, as traditional measures to **stimulate economic growth, such as increasing the money supply, may exacerbate inflation.**
- **Reflation:** Reflation is an **attempt to stimulate an economy that is experiencing deflation.**
- It involves the implementation of monetary or fiscal policies to **increase the money supply and boost aggregate demand, with the aim of reversing deflation and stabilizing prices.**

Key Points from RBI's December 2023 Bulletin: State of the Economy

Global Economic Outlook:

- **Inflation Impact:** A **slowing rate of global inflation may contribute to a reduction in global interest rates** in the future.

Interest Rate Reductions:

- **Potential Scenario:** Disinflation in different geographies may pave the way for interest rate reductions globally.
- **Expectations:** **Central bank officials anticipate a possibility of reduced global interest rates in response to economic conditions.**

Indian Economic Scenario:

- **Economic Activity:** India is experiencing a broad-based strengthening of economic activity.
- **Factors Supporting Growth:** **Easing input costs and corporate profitability** are expected to sustain economic activity in India.

CPI Inflation in India:

- **Recent Trends:** Consumer Price Index (CPI) inflation in India rose to 5.6% in November.
- **Projection:** Officials anticipate CPI inflation to ease to an average of 4.6% in the first three quarters of 2024-25.

Domestic Financial Markets:

- **Market Performance:** **Domestic financial markets have been positively influenced by the enduring strength of the real economy.**

Indian Economic Growth in 2023:

- **Optimistic Outlook:** Despite significant global challenges, the **Indian economy remained the fastest-growing major economy in 2023.**
- **Consumer Confidence:** Cautious optimism prevails as consumer confidence remains positive, and perceptions about current income improved.

Supply Chain Pressures and GDP Growth:

- **GDP Growth Forecast:** The Reserve Bank of India's **Economic Activity Index** forecasts GDP growth for Q3 2023-24 at **6.7%.**

Outlook for H2 2023-24 and 2024-25:

- **Sustained Growth:** Despite some moderation, **growth is expected to be sustained in the second half of 2023-24 and in 2024-25.**
- **Positive Indicators:** Positive consumer confidence and favorable perceptions about current income contribute to the outlook.

Topic 47. RECONSTITUTION OF NATIONAL START-UP ADVISORY COUNCIL

Important for the subject: Economy

The National Start-up Advisory Council (NSAC) has been reconstituted by the Indian government. **31 non-official members have been nominated for the NSAC**, representing various stakeholders in the startup ecosystem.

- Non-official members include **founders of successful start-ups, veterans with experience in scaling companies, individuals representing the interests of startup investors, and representatives from associations.**
- Notable individuals nominated include **Abhiraj Singh Bhal from Urban Company and Kunal Bahl from Snapdeal.** The term of non-official members is **typically two years.** The reconstitution follows the completion of the initial term.
- The NSAC serves as an **advisory body to the government, providing guidance on measures to strengthen the innovation and startup ecosystem in India.**
- The **Department for Promotion of Industry and Internal Trade (DPIIT)** had **originally constituted the council in January 2020.**
- The council suggests measures to **foster a culture of innovation, particularly among citizens and students.** It also aims to promote innovation across all sectors of the economy, including semi-urban and rural areas.
- The eighth meeting of the NSAC is **scheduled to take place under the chairmanship of the Commerce and Industry Minister on December 19.**
- The council meets regularly to discuss and recommend initiatives that contribute to the

growth and development of the startup ecosystem in the country.

- **Presidents of industry chambers like CII (Confederation of Indian Industry) are also part of the NSAC, providing a holistic perspective.**
- One of the council's objectives is to **promote innovation not only in urban areas but also in semi-urban and rural regions, ensuring a broader impact.**
- In summary, the reconstitution of the NSAC reflects the government's commitment to fostering innovation and supporting the startup ecosystem in India. **The diverse representation of stakeholders contributes to a comprehensive approach in addressing challenges and promoting growth in the startup sector.**

National Startup Advisory Council (NSAC):

- The NSAC was **constituted by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Union Ministry of Commerce and Industry.**
- The primary objective of NSAC is to advise the Government on measures **aimed at building a robust ecosystem for nurturing innovation and startups.** The ultimate goal is to drive sustainable economic growth and generate significant employment opportunities.

Composition:

- **Chairman:** The council is chaired by the Minister for Commerce & Industry. **Ex-officio Members:** These include nominees from concerned Ministries/Departments/Organizations, not below the rank of Joint Secretary.
- **Non-official Members:** The council includes non-official members representing **various stakeholders, such as founders of successful start ups and veterans who have contributed to the growth and scaling of companies in India.**
- NSAC plays a crucial role in identifying areas for **intervention to expand the startup ecosystem. It engages in ideation and nurturing national programs under the Startup India initiative.**
- In summary, the National Startup Advisory Council is a key mechanism in driving the objectives of the Startup India initiative, aligning with the **government's vision to promote innovation, entrepreneurship, and economic growth in India.**

Start-up India Initiative:

- **Launch Date:** The Startup India initiative was launched in 2016.
- **Flagship Initiative:** **Startup India is a flagship initiative of the Government of India, to catalyze a startup culture and establish a strong, inclusive ecosystem for**

innovation and entrepreneurship in the country.

- Startup India seeks to **provide support and encouragement to startups through various policy measures, incentives, and initiatives.** By nurturing startups, the initiative aims to contribute to sustainable economic development and job creation on a large scale.

Start up India Seed Fund Scheme (SISFS):

- The Startup India Seed Fund Scheme (SISFS) is an initiative by the Government of India to **provide financial assistance to startups in their early stages.**
- The primary goal of SISFS is to **support startups by providing them with seed funding to help them kickstart their operations and contribute to their growth.**
- Under the scheme, **eligible startups receive financial assistance to meet their initial funding requirements, fostering a conducive environment** for their development.
- The government allocates funds to the Startup India Seed Fund Scheme to **facilitate the provision of financial support to qualifying startups.**
- Startups can utilize the funds for various purposes, **including product development, market entry strategies, proof of concept, prototype development, and other early-stage activities.**

Topic 48. OVERVIEW OF TRUST FUNDS AT THE WORLD BANK

Important for the subject: Economy

Strategic Use of Trust Funds:

Trust funds are strategic financing instruments used by the World Bank to complement core funding from IBRD and IDA.

- They support specific **development priorities, regions, and thematic focus areas.** Trust funds enhance the World Bank's capacity to **deliver results in client countries.**
- They provide **financial resources for global public goods, fragile states, disaster prevention, relief, partnerships, and innovation.**

Trust Fund Reform:

- The World Bank has undertaken reforms to improve the effectiveness of trust fund resources and activities.
- The latest reform transitions the IBRD/IDA trust fund portfolio into **larger Umbrella 2.0 Programs.**

Objectives of Trust Fund Reform:

- Improve **strategic alignment, efficiency, and management oversight.**
- Reduce fragmentation and transaction costs.

Benefits for Development Partners:

- **Elevates the World Bank-Donor partnership to focus on strategy.** Enables collective action at scale on development challenges. Supports knowledge exchange, results reporting, and visibility.
- **Facilitates better alignment of trust fund activities with country priorities.** Integrates trust fund resources more effectively into World Bank country programs.

Umbrella Programs:

- **Aligned with World Bank's priorities, maximizing development resource value. Strengthened integration with institutional strategy, planning, and budgeting processes.**
- **Facilitate elevated dialogue between the World Bank and development partners.** Operate at scale to achieve improved results on the ground. Enhance development effectiveness and impact for client countries.
- Umbrella 2.0 Programs come with **standardized approaches to governance, communications, visibility, and results management.** Reduce transaction costs and enhance focus on delivering impactful results.
- The trust fund reform aims to streamline the World Bank's trust fund portfolio, **fostering better coordination, alignment, and efficiency in addressing global development challenges.**

Trust Funds at WB

- Trust funds at the World Bank are **financial mechanisms that allow donors to pool their contributions and support specific programs, projects, or initiatives aligned with the World Bank's development goals.**
- **These funds are often earmarked for particular sectors, themes, or geographic regions.** The World Bank manages and administers these trust funds, ensuring that resources are allocated efficiently and used in accordance with the donors' intentions.
- Trust funds can support a wide range of activities, **including poverty reduction, education, health, infrastructure development, and environmental sustainability.**
- They play a crucial role in leveraging additional resources, promoting collaboration

between the public and private sectors, and addressing pressing global challenges.

- The World Bank's engagement with trust funds reflects a partnership approach, where various stakeholders, including governments, philanthropic organizations, and private entities, come together to address specific development needs.
- **The flexibility and targeted nature of trust funds enable the World Bank to respond to emerging challenges and implement innovative solutions to promote sustainable development worldwide.**

Overview of World Bank

Foundation and Purpose:

- **Founded in 1944 under the Bretton Woods Agreement. Dedicated to providing financing, advice, and research to aid the economic advancement of developing nations.**
- Fights poverty by offering developmental assistance to middle- and low-income countries.

Structure and Institutions:

- Comprises five cooperative institutional organizations known as the World Bank Group:
 1. **International Bank for Reconstruction and Development (IBRD)**
 2. **International Development Association (IDA)**
 3. **International Finance Corporation (IFC)**
 4. **Multilateral Investment Guarantee Agency (MIGA)**
 5. **International Centre for Settlement of Investment Disputes (ICSID)**
- Each institution focuses on specific areas such as debt financing, interest-free loans, private sector investment, guaranteeing investments, and resolving investment disputes.

Funding Sources:

- **Obtains funds from member countries' capital subscriptions, bond flotations, and earnings from interest payments. Capital subscriptions determine voting power, favoring wealthier and more developed countries.**
- **International Bank for Reconstruction and Development (IBRD):** The International Bank for Reconstruction and Development (IBRD) is a vital component of the World Bank Group, playing a key role in promoting global economic development.
- **Established to assist middle-income and creditworthy low-income countries, IBRD provides financial and technical assistance to support a wide range of projects, from infrastructure development to social programs.**

- Through its lending activities and expertise, IBRD contributes significantly to poverty reduction and sustainable development initiatives worldwide.
- **International Development Association (IDA):** The International Development Association (IDA) is an essential arm of the World Bank Group dedicated to **addressing the unique challenges faced by the world's poorest countries.**
- **IDA provides low-interest loans and grants to these nations, enabling them to invest in critical areas such as education, healthcare, and infrastructure.**
- By focusing on poverty reduction and sustainable development, IDA aims to uplift marginalized communities and foster long-term economic growth in regions where resources are limited.
- **International Finance Corporation (IFC):** The International Finance Corporation (IFC) serves as the private sector arm of the World Bank Group, **striving to advance sustainable and inclusive economic development.**
- **IFC supports private enterprises by providing investment, advisory services, and risk management tools.** By fostering entrepreneurship and innovation, IFC contributes to job creation, poverty alleviation, and the development of vibrant markets in emerging economies.
- **Multilateral Investment Guarantee Agency (MIGA):** The Multilateral Investment Guarantee Agency (MIGA) operates as a critical instrument within the World Bank Group, promoting foreign direct investment (FDI) in developing countries.
- **MIGA offers political risk insurance and credit enhancement to encourage private-sector investments in regions where uncertainties may deter potential investors.**
- **Through its risk mitigation strategies, MIGA facilitates the flow of capital to support projects** that contribute to economic growth and development.
- **International Centre for Settlement of Investment Disputes (ICSID):** The International Centre for Settlement of Investment Disputes (ICSID) is an autonomous international institution that facilitates the resolution of investment disputes between governments and private sector entities.
- Established under the auspices of the World Bank, **ICSID provides a neutral and effective forum for arbitration and conciliation, helping to ensure fair and transparent resolution mechanisms for investment-related conflicts.**
- **ICSID plays a crucial role in promoting investor confidence and fostering a stable environment for international investment.**

Topic 49. LIC GRANTED EXTENSION FOR MINIMUM PUBLIC SHAREHOLDING (MPS) COMPLIANCE

Important for the subject: Economy

SEBI's MPS Norms:

SEBI (Securities and Exchange Board of India) has **prescribed Minimum Public Shareholding (MPS) norms for listed companies.**

- Rule 19A of the Securities Contract Regulation Rules states that **every listed company, except public sector companies, should maintain a public shareholding of at least 25%.**

LIC's Ownership Structure:

- As of September 30, 2023, the government owns 96.5% of LIC (Life Insurance Corporation of India).
- **The government had divested 3.5% of its shareholding in LIC, and the company got listed on stock exchanges.**

Exemption Granted:

- The Department of Economic Affairs, Ministry of Finance, has **granted LIC a one-time exemption to achieve 25% MPS within ten years from the date of listing, i.e., until May 2032.**
- This exemption is **in the public interest and aligns with Rule 19A(6) of the Securities Contract (Regulations) Rules 1957.**

SEBI Regulations:

- Rule 19A (6) allows a listed company to have three years from the date of listing to ensure MPS.
- The objective is to **encourage broader public shareholding, including individuals and institutions.**

Finance Ministry's Earlier Statement:

- Earlier, the Finance Ministry stated that a **listed public sector undertaking (PSU) would continue to be exempt from MPS norms for a specified period.**
- The **exemption** applies to entities where the Central Government, State Government, or public sector company holds the majority of shares, voting rights, or control.

Exemption Duration:

- **The exemption specified by the Economic Affairs Department for LIC will be valid**

until May 2032.

- It continues irrespective of any change in control of LIC after the issuance of the exemption.
- This exemption **provides LIC with an extended timeline to meet MPS norms, contributing to the government's ongoing disinvestment strategy for the insurance giant.**

Minimum public shareholding requirement

- Securities and Exchange Board of India (SEBI) mandates a minimum public shareholding requirement for listed companies in India.
- The **minimum public shareholding norms are outlined in the SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015.**
- As per these regulations, **a listed company is required to maintain a minimum public shareholding of 25%.**
- This means that **at least 25% of the total shares of the company should be held by public shareholders, which include individual investors, institutional investors, and other non-promoter entities.**
- Companies are expected to comply with this requirement within a specified timeframe from the date of listing.
- **In case a company does not meet the minimum public shareholding criteria, it may be required to take necessary steps to achieve compliance.**
- **Failure to comply with SEBI's regulations can lead to penalties and other regulatory actions.**

Topic 50. HOW MPS ARE SUSPENDED

Important for the subject: Polity

78 Opposition MPs suspended

Who can suspend an MP:

It is the **role and duty of the Presiding Officer** i.e. **Speaker of Lok Sabha and Chairman of Rajya Sabha** to maintain order so that the House can function smoothly.

- In order to ensure that proceedings are conducted in the proper manner, **the Speaker/Chairman is empowered to force a Member to withdraw from the House.**

What are the rules under which the Presiding Officer/Chairman acts:

For Lok Sabha

- **Rule Number 373 of the Rules of Procedure and Conduct of Business.** The Speaker can order a member to immediately leave the House if the member's conduct is disorderly.
- Those directed to withdraw **must do so promptly and stay absent for the remainder of the day's sitting.**

Rule 374:

- The Speaker can name a member who disrespects the Chair's authority or persistently obstructs House business.
- The named member faces suspension from the House, but this suspension should not exceed the remainder of the session. The suspended member must leave the House premises.

Rule 374A (Added in December 2001):

- In cases of gross violations or serious charges, if named by the Speaker, a member is automatically suspended from the House's service for five consecutive sittings or the remaining session, whichever is shorter.

For Rajya Sabha:**Rule 255 of the Rule Book of Rajya Sabha:**

- It empowers the Chairman of Rajya Sabha to direct any Member to withdraw immediately from the House for any disorderly conduct.

Rule 256

- This rule empowers the Chairman to name the members who persistently disregards the authority of the Chair or **abuses the rules of the Council.**
- After that, the House may adopt a motion suspending the Member for a period not exceeding the remainder of the session.
- It should be noted that, **unlike Lok Sabha (under rule 374A), Rajya Sabha can not suspend its members without passing a motion for the same.**

What are the terms of Suspension:

- The **maximum period** of suspension is for the **remainder of the session.** Suspended members **cannot enter the chamber or attend the meetings** of the committees.
- He **will not be eligible to give notice** for discussion or submission. He **loses the right to get a reply to his questions.**

Can courts intervene in a matter of suspension of MPs:

- **Article 122** of the Indian Constitution **establishes the principle that parliamentary**

proceedings are not Important for the subject to questioning in a court of law.

- Nevertheless, there **have been instances** where the **judiciary has intervened in the procedural workings** of legislatures.
- One such case involves the **Maharashtra Legislative Assembly**, which, **during its 2021 Monsoon Session**, **passed a resolution to suspend 12 BJP MLAs** for a year.
- This matter eventually **reached the Supreme Court**, which ruled that the resolution's **legal effect extended only for the duration of the Monsoon Session and not beyond**.

Topic 51. FINANCE SECY. FAILS TO APPEAR IN HOUSE, MATTER SENT TO PRIVILEGES COMMITTEE

Important for the subject: Polity

The Principal Secretary of the Finance Department failed to appear before the Delhi Legislative Assembly after being summoned by it, prompting Speaker Ram Niwas Goel to refer the matter to the Privileges Committee of the House.

The Assembly had passed a resolution asking Principal Secretary (Finance) Ashish Chandra Verma to appear before it to explain why funds were not being released by his department for various works in the city.

Basic Concepts For Prelims:

Parliamentary Privileges:

- Parliament and its Members (MP's) have **certain rights and immunities that enable them to function effectively in their legislative roles**. These are called parliamentary privileges.
- **Article 105 and Article 194 of the Indian Constitution** mentioned certain privileges for the Member of Parliament and State Assembly respectively so that they can perform their duties without any obstruction.
- **They are the special rights, immunities and exemptions enjoyed by the Members of Parliament/State Assembly, its committees and their members.**
- **These privileges do not extend to the president** who is also an integral part of the Parliament. These privileges are necessary to secure their independence in working.
- Without these privileges; The Houses cannot maintain their authority, dignity and honour. The House cannot protect its members from any obstacle in the discharge of their parliamentary responsibilities.
- The Indian Constitution has also extended these privileges to the persons who are authorised to speak and take part in the Parliamentary procedures or any of its

committees.

These include the attorney general of India and Union ministers.

Sources of the privileges:

- The Parliament till now not explicitly create code for privileges. As of now, it is based on **5 sources – Constitution, statutes, House procedures, Parliamentary conventions and judicial interpretations.**

Breach of privilege:

- A breach of privilege is a **violation of any of the privileges** of MPs/Parliament. Among other things, any action ‘casting reflections’ on MPs, parliament or its committees; could be considered breach of privilege.
- This may include publishing of news items, editorials or statements made in newspaper/magazine/TV interviews or in public speeches.

Two broad categories of Privileges:

- **Collective Privileges** – Those that are collectively enjoyed by the each House of Parliament.
- **Individual Privileges** – Those that are individually enjoyed by the members.

About the Privilege committee:

- **Each House of Parliament is the guardian of its privileges.** Lok Sabha and Rajya Sabha have the authority to take suit- able action against anyone who breaches the privileges of its members or commits contempt of the House.
- There are two mechanisms by which Parliament takes up these matters. The first is by a member raising the issue on the floor of the House, and then the House decides on it.
- But Lok Sabha and Rajya Sabha usually **send the matter for a detailed examination to their Privilege committee.** The committee recommends to the House a course of action which is then accepted by it.
- This **Committee consists of 15 members (10 members in case of Rajya Sabha) nominated by the Speaker (Chairman in case of Rajya Sabha).**
- Its function is to examine every question involving breach of privilege of the House or of the members of any Committee therefore referred to it by the House or by the Speaker.
- It determines with reference to the facts of each case whether a breach of privilege is involved and makes suitable recommendations in its report. It also states the procedure to be followed by the House in giving effect to the recommendations made by it.
- When a question of privilege is referred to the Committee by the House, the report of the Committee is presented to the House by the Chairman or, in his absence, by any member

of the Committee.

- Where a question of privilege is referred to the Committee by the Speaker under rule 227, the report of the Committee is presented to the Speaker who may pass final orders thereon or direct that it be laid on the Table of the House.
- The Speaker/ Chairman may refer to the Committee any petition regarding disqualification of a member on ground of defection for making a preliminary inquiry and submitting a report to him.
- The procedure to be followed by the Committee in these cases is so far as may be same as applicable to questions of breach of privilege.

What kinds of cases come to the committee?

- Usually, the committees examine cases where MPs complain that an outsider has breached their privilege.
- For example, the Lok Sabha committee recently looked at multiple instances in which MPs **alleged that government officials have either violated protocol or been unresponsive.**
- **But this year, MPs have also brought questions about breach of privilege by other MPs.**
- In Rajya Sabha, MPs have brought eight cases of breach of privilege against their colleagues. These are about video recording unauthorised proceedings, gross disorderly conduct, repeated submission of identical notices, disrespectful observations against the chairman, misleading the media about the house proceedings.

What actions can the committee take?

- **The Committee of Privileges has the power to recommend to the House for its consideration the issuance of admonitions, reprimands, suspension and, in rare cases, expulsion from the House.**
- The convention followed by the committee of both Houses is that if the MP against whom a privilege House proceedings matter is raised gives an unqualified apology the issue is allowed to rest.

Topic 52. HIGHLIGHTS ON MOD AND PAC DISAGREEMENT ON SOLDIERS' NEEDS

Important for the subject: Polity

Contention Over Winter Supplies:

The Ministry of Defence (MoD) and Lok Sabha's Public Accounts Committee (PAC) disagree over issues **related to winter clothing, equipment, and ration for soldiers deployed at high altitudes.**

Funding Challenges:

- PAC emphasizes the **need for separate budgets for such requirements to avoid delays and the supply of recycled materials**. The panel challenges MoD's repeated claim of no dearth of funds.

Quality Standards and Expired Items:

- PAC flags serious discrepancies in quality standards and the supply of expired items. The **Directorate General of Quality Assurance (DGQA) faces reprimand for overlooking troop acceptance of technical specifications**.

Recommendation for DGQA:

- PAC insists on **bringing DGQA under the Services to enhance responsiveness and accountability**.

Budgetary Allocation Issues:

- **Expenditure on High Altitude Clothing and Equipment (HACE) faces challenges as it is met from the allotment under 'General Stores and Clothing,' which caters to the entire Army.**
- **PAC recommends separate budget heads to cater specifically to high-altitude needs.**

Impact on Troops:

- **Procedural delays, non-supply or supply of recycled items affect the health and hygiene of troops in high-altitude areas.** Lack of research and development and dependence on imports contribute to the challenges.

Contradictions in Ministry's Replies:

- PAC notes contradictions in MoD's replies, stating that **budgetary constraints do not affect procurement, while also acknowledging shortages due to budget limitations**.

Justification for Separate Budgets:

- PAC justifies the recommendation for **separate budget heads, emphasizing better fund management, monitoring, and timely revisions for clothing, equipment, housing, and ration in high-altitude areas**.

Response to Audit Findings:

- Instances of procedural delays and non-supply highlighted during the audit contradict MoD's claim of no budgetary constraints affecting procurement.

Panel's Persistence on Recommendations:

- Despite MoD's earlier replies and persistence on existing fund allocation methods, **PAC**

stands by its recommendation for separate budget heads, considering the terrain-specific needs.

Directorate General of Quality Assurance (DGQA):

- DGQA is a regulatory body responsible for ensuring the quality and reliability of defense products and services in India.
- It was established to oversee quality assurance in defense production and procurement.
- DGQA operates under the Ministry of Defence and plays a crucial role in maintaining the standards of defense equipment.
- The primary function is to provide regulatory oversight, inspection, and quality assurance for defense-related products, including weapons, ammunition, vehicles, and electronic systems.
- In summary, DGQA is a key institution in India's defense establishment, focusing on maintaining high-quality standards in defense production to meet the operational needs of the armed forces.

Topic 53. HOUSE NOD TO RAISE AGE LIMIT FOR GST APPELLATE TRIBUNAL

Important for the subject: Polity

House nod to raise age limit for GST appellate tribunal

The Rajya Sabha has returned a bill to raise the age limit of the President and members of the Goods and Services Tax (GST) Appellate Tribunals from 67 to 70 years and 65 to 67 years, respectively, aligning them with the age limits of other tribunals.

The Central GST (Second Amendment) Bill, 2023, was introduced by Union Finance Minister Nirmala Sitharaman.

The amendment aims to address issues arising from the Madras High Court's 2019 decision to strike down the formation of GST Appellate Tribunals, necessitating amendments to the GST Act in July 2023.

- The Bill also allows members of the Bar with 10 years of experience to serve as judicial members of the tribunals.
- The Rajya Sabha also returned the Provisional Collection of Taxes Bill, 2023, which replaced the Provisional Collection of Taxes Act, 1931. Both bills were passed by the Lok Sabha on the preceding day.

What is Goods and Services Tax (GST):

- GST is an indirect tax that came into effect from 1 July 2017 through the

implementation of the **101st Amendment to the Constitution of India** by the Indian government.

- It has actually replaced **various indirect taxes** such as – **service taxes, VAT, excise** and others in the country.
- GST rates are divided into **five different tax slabs** for collection of tax – **0%, 5%, 12%, 18% and 28%**.
- There are three types of GST i.e **State Goods and Services Tax (SGST), Central Goods and Services Tax (CGST) and the Integrated Goods and Services Tax (IGST)**

What is the GST Council:

- GST Council is a **constitutional body** for making recommendations to the Union and State Government on issues related to **Goods and Service Tax**.
- It makes **recommendations to the Union and State Government** on issues related to Goods and Service Tax and was introduced by the Constitution (**One Hundred and First Amendment**) Act, 2016.
- As per **Article 279A** of the amended Constitution, the **GST Council which will be a joint forum of the Centre and the States**, shall consist of the following members: –

Union Finance Minister – Chairperson

The Union Minister of State, in-charge of Revenue of finance – Member

- **The Minister In-charge of finance or taxation or any other Minister nominated by each State Government – Members**
- As per **Article 279A (4)**, the Council will make **recommendations to the Union and the States on important issues** related to GST, like the goods and services that may be Important for the subjected or exempted from GST, model GST Laws, principles that govern place of Supply, threshold limits, GST rates including the floor rates with bands, special rates for raising additional resources during natural calamities/disasters, special provisions for certain States, etc.
- **Every decision of the Goods and Services Tax Council** shall be taken at a meeting by a **majority of not less than three-fourths** of the weighted votes of the members present and voting, in accordance with the following principles, namely:
 - **The vote of the Central Government** shall have a weightage of **one third of the total votes cast, and**
 - **The votes of all the State Governments** taken together shall have a **weightage of two-thirds of the total votes cast**, in that meeting.

What is GST Appellate Tribunal:

- The Central Goods and Service Tax Act, 2017 in **Section 109** mandates for the

constitution of a GSTAT and its Benches.

- The GSTAT is the **specialized appellate authority for resolving disputes under the GST laws.**

Composition:

- The GST Tribunal will have **one principal bench in New Delhi** and as many **benches or boards in states as decided by each state**, Important for the subject to approval of the council.
- **North-eastern states could opt for one bench for 2-3 states** and an additional bench for very far-flung areas.
- The **principal bench and state boards would have two technical and two judicial members** each, with equal representation from the Centre and states.
- **All four members would not sit for hearing each case.** It depends on the **threshold or value of dues involved.**

Topic 54. ELIMINATION OF CHILD LABOUR A DISTANT GOAL

Important for the subject: Polity

Parliamentary panel suggested country needs uniform definition of 'child' to eliminate child labour.

- The **parliamentary panel on Labour, Textiles, and Skill Development** has emphasized the need for a **uniform definition of 'child' across various laws** to effectively implement the **policy aimed at eliminating child labour by 2025.**
- The panel **found ambiguity in the definition of 'child'** under different legislations and highlighted **discrepancies in age criteria** and offenses related to child labour.
- According to the **52nd report of the Parliamentary Standing Committee**, there is **ambiguity in the definition of 'child'** under different legislations, such as the **Child and Adolescent Labour (Prohibition and Regulation) Act, 1986,**
- **the Right of Children to Free and Compulsory Education Act, 2009, the Minimum Wages Act, 1948, and the Juvenile Justice (Care and Protection of Children) Act, 2015.**
- The committee **also notes that the employment of children in violation of the Child and Adolescent Labour (Prohibition and Regulation) Act, 1986, is a cognizable offense,** while under the **Juvenile Justice Act, 2015, it is a non-cognizable offense.**
- The panel suggests **addressing these differences in the criteria for determining** the age of a child and the classification of offenses to avoid ambiguity. Furthermore, **the panel recommends that hazardous occupations and processes should not be included in the positive list** of activities where adolescents can work.

- It emphasizes the need for strict punishment, such as cancellation of licenses and property attachment, in addition to increasing fines to achieve zero tolerance for child labour.
- Regarding the utilization of fines collected for child labour offenses, the panel urges the Ministry of Labour & Employment to formulate guidelines and increase the fine amount, considering inflation.
- It recommends creating a district-level fund for child labourers and suggests using the fund for the rehabilitation of trafficked and migrant child labourers repatriated from other states.
- The committee also proposes holding principal employers and traffickers accountable for the deployment of child labour.
- It calls for amendments in the relevant acts to ensure zero tolerance for child labour and recommends a comprehensive Standard Operating Procedure (SOP) for the functions of district project societies (DPS).
- Additionally, the panel suggests incorporating provisions in the Child and Adolescent Labour (Prohibition and Regulation) Act similar to those in the Protection of Children from Sexual Offences Act, 2012, for action against police for not registering FIRs.
- It advocates assigning the responsibility of reporting children selling goods or begging at traffic lights to traffic police and making them accountable for not reporting such instances.
- The committee desires the establishment of a National Level Child Tracking Mechanism to facilitate coordination among states and the Centre for monitoring and reporting at the district level.
- It emphasizes the importance of preventing, tracing, tracking, rescuing, rehabilitating, and reintegrating rescued children and recommends the development of a detailed SOP in consultation with all stakeholders.

What is a Parliamentary Committee:

- A Parliamentary committee consists of Members of Parliament who are either elected or appointed from the members of the house, or nominated by the Speaker or Chairman.
- The concept of Parliamentary committees originated in the British Parliament and has been adopted in India.
- These committees operate under the guidance of the Speaker of Lok Sabha or the Chairman of Rajya Sabha, presenting their findings and recommendations to the respective houses.

- The **authority of Parliamentary committees** is derived from the constitution. **Article 105** outlines the **powers, privileges, etc., of the houses of Parliament** and of the members and committees thereof.
- **Article 118** states that **each House of Parliament may establish rules for regulations, Important for the subject to the provisions** of the constitution, governing its procedure and the conduct of its business.

Topic 55. LOK SABHA PASSES TELECOM BILL 2023 TO REPLACE 138 YEAR OLD TELEGRAPH ACT

Important for the subject: Polity

The Telecommunications Bill, 2023 was introduced in the Lok Sabha by the Union minister for Communications, Electronics & Information Technology recently.

About the Telecommunications Bill, 2023:

- The Telecommunications Bill, 2023 amends and consolidates the laws relating to:
- development, expansion and operation of telecommunication services and telecommunication networks; assignment of spectrum; and for matters connected therewith.
- The new Bill seeks to **replace the Indian Telegraph Act, 1885**, the Indian Wireless Telegraphy Act, 1933, and the Telegraph Wires (Unlawful Possession) Act, 1950.

Highlights of the Bill:

National Security:

- The Bill allows the government to take over telecom services and intercept messages in the interests of national security and in case of emergencies.
- The Bill says that on the occurrence of any public emergency, including disaster management, or in the interest of public safety, the Central Government or a State Government can:
 - take temporary possession of any telecommunication service or telecommunication network from an authorised entity; or
 - provide for appropriate mechanism to ensure that messages of a user or group of users authorised for response and recovery during public emergency are routed on priority.
- Under the new Bill, the government can also ask telecommunication services to transmit specific messages.

Simplification of licensing:

- The Bill seeks to **simplify the current licensing regime for telecom networks by**

moving towards an authorisation system.

- Currently, the telecom department issues more than 100 types of licences, registrations, and permissions. The Bill seeks to club many of those in a single authorisation process.

Voluntary disclosure:

- A voluntary undertaking mechanism to facilitate voluntary disclosure of inadvertent lapses and to facilitate compliance has been introduced.
- A tiered structure for settling disputes arising out of breach of terms and conditions involving an adjudicating officer, designated committee of appeals and the **Telecom Disputes Settlement and Appellate Tribunal (TDSAT)** on top.

Biometric authentication:

- Entities have been mandated to carry out **biometric authentication of their users as a measure to curb fraud.**
- The provision has raised concerns about the privacy of users.

Powers of government:

- The Bill empowers the central and state governments or a specially authorised officer to seek interception, disclosure, and suspension powers in case of a public emergency or interest or safety.
- Press messages, meant for publication in India and of correspondents accredited to state or central governments, have been exempted from interception, although they can be intercepted for national security reasons.

Authorisation for telecom-related activities:

- Prior authorisation from the central government will be required to:
- provide telecommunication services, establish, operate, maintain, or expand telecommunications networks, or possess radio equipment.
- Existing licences will continue to be valid for the period of their grant, or for five years, where the period is not specified.

Assignment of spectrum:

- Spectrum will be assigned by auction, except for specified uses, where it will be allocated on an administrative basis. These include purposes such as:
- national security and defence, disaster management, weather forecasting, (iv) transport, satellite services such as DTH and satellite telephony, and BSNL, MTNL, and public broadcasting services.
- The central government may re-purpose or re-assign any frequency range. The central

government may permit sharing, trading, leasing, and surrender of spectrum.

Powers to specify standards:

- The central government may prescribe standards and assessments for telecom equipment, infrastructure, networks, and services.

Right of way:

- Facility providers may seek a right of way over public or private property to establish telecom infrastructure.
- Right of way must be provided on a non-discriminatory and non-exclusive basis to the extent possible.

Protection of users:

- The central government may provide for measures to protect users which include:
- prior consent to receive specified messages such as advertising messages, creation of Do Not Disturb registers, and a mechanism to allow users to report malware or specified messages.
- Entities providing telecom services must establish an online mechanism for registration and redressal of grievances.

Digital Bharat Nidhi:

- The **Universal Service Obligation Fund** has been established under the 1885 Act to provide for telecom services in underserved areas.
- The **Bill retains this provision, renames the fund as Digital Bharat Nidhi**, and also allows its use for research and development.

Adjudication process:

- The central government will appoint an adjudicating officer to conduct inquiries and pass orders against civil offences under the Bill. The officer must be of the rank of joint secretary and above.
- Orders of the adjudicating officer may be appealed before the Designated Appeals Committee within 30 days.
- Appeals against the orders of the Committee, in connection to breach of terms and conditions, may be filed with The Telecommunications Dispute Settlement and Appellate Tribunal within 30 days.

Issues:

- As per the new Bill, telecom services and networks will need authorisation from the government, unless it decides to exempt certain entities in public interest.

- There are concerns that the current definition of telecommunication could be interpreted in a way to potentially open the door for the telecom department to regulate online platforms.
- The Allocation of Business Rules could stand in the way of that since the telecom department's remit is limited to regulating the 'carrier' layer, that is telecom services, under those rules.

Topic 56. IPC TO BNS WHAT HAS CHANGE

Important for the subject: Polity

Lok Sabha nod for 3 bill on criminal law

The **Bharatiya Nyaya Sanhita Bill, 2023** proposes **significant changes** to the **Indian Penal Code**; it aims to replace some **notable modifications including incorporating terrorism and organized crime into regular criminal law, implementing gender neutrality for offenses related to children, and repealing Section 377**, which criminalized homosexuality.

What are the new offenses:

- **Promise to Marry: Clause 69** criminalizes a “deceitful” promise to marry, addressing the “love jihad” narrative. It includes **consensual sexual activity**, making it punishable with imprisonment up to ten years.
- **Mob Lynching:** The Bill **codifies offenses** linked to **mob lynching** and **hate-crime murders**, imposing punishments **ranging from life imprisonment to the death penalty for offenses committed by a mob of five or more** individuals based on factors such as race, caste, community, or personal belief.
- **Organized Crime:** For the first time, **organized crime is brought under ordinary criminal law**, with punishment for **attempts and committed offenses ranging from five years to life imprisonment or death**, depending on whether death is involved.
- **Petty Organized Crime:** A separate category criminalizes **offenses such as theft, snatching, cheating, unauthorized selling of tickets, unauthorized betting or gambling, and selling of public examination question papers.**
- **Terrorism:** Terrorism is included under **ordinary criminal law, borrowing language from the Unlawful Atrocities Prevention Act.** The definition of “terrorist” is **broad, and the offense involving terror financing is broader in the BNS** than in UAPA.
- **Attempt to Suicide:** The BNS **criminalizes attempting suicide** with the intent to compel or restrain a public servant from **discharging official duty**, prescribing a **jail term up to one year with community service.**
- This provision could be applied to prevent self-immolations and hunger strikes during protests.

What are the deleted offences:

- The Bharatiya Nyaya Sanhita Bill, 2023 **introduces changes in various areas:**
Unnatural Sexual Offences: Section 377, which **criminalized homosexuality** and other “unnatural” sexual activities, has been repealed.
- However, concerns arise as its total omission may impact **addressing non-consensual sexual acts, especially as rape laws remain gendered.**
- **Adultery:** The offense of adultery, **previously struck down by the Supreme Court in 2018 as unconstitutional, has been omitted in the BNS.**
- **Thugs:** The BNS **fully omits Section 310 of the IPC**, which **criminalizes individuals habitually associated with others for purposes like robbery and child-stealing, labeled as “thugs.”**
- **Gender Neutrality:** While **rape laws still apply only to women, the BNS introduces gender neutrality in certain laws. Procurement of a girl (Section 366A of IPC) and kidnapping of minors (Section 361 of IPC) are made gender-neutral.**
- For offenses like **outraging the modesty of women (354A) and voyeurism (354C), gender neutrality for the accused is established**, allowing women to be booked under the law.

What are the Other tweaks:

- **Fake News:** The BNS introduces a **new provision criminalizing the publication of false and misleading information**, addressing concerns related to fake news.
- **Sedition:** Although initially **stated as repealed, the BNS reintroduces sedition under a new name, ‘deshdroh,’**
- With a broader definition. It now **encompasses aiding subversive activities** through financial means and encouraging feelings of separatist activities.
- **Mandatory Minimum Sentence:** The BNS introduces **mandatory minimum sentences in various provisions**, deviating from the discretionary powers of judges.
- For instance, **Section 303 is tweaked to prescribe “death or imprisonment for life, which shall mean the remainder of that person’s natural life.”**
- **Damage to Public Property:** Offences **related to causing damage to public property now carry a graded fine** under the BNS, where the **fine corresponds to the amount of damage caused.**
- **vents where lava, tephra (small rocks), and steam erupt onto the Earth’s surface, according to the US Geological Survey.**
- They can be **on land or in the ocean** and form when **material significantly hotter than its surroundings, such as magma (underground) or lava (on the surface), ash, and/or**

gases, erupts onto the Earth's surface.

- The rise of magma can occur when tectonic plates move away from each other, move towards each other, or at hotspots inside the Earth, where magma is heated up, becoming less dense and rising.

What are the different kinds of volcanoes:

- The type of volcano is determined by factors such as the viscosity of the magma, the amount of gas in the magma, the composition of the magma, and the way the magma reaches the surface, according to the British Geological Survey.
- There are two main types of volcanoes: stratovolcanoes and shield volcanoes. Stratovolcanoes have steep sides and a more cone-shaped structure, while shield volcanoes have a low profile resembling a shield lying on the ground.
- Additionally, various volcanic features can form from erupted magma, such as cinder cones or lava domes, along with processes that shape volcanoes.

Why is Iceland so volcanically active:

- Iceland experiences frequent volcanic activity due to its location on the Mid-Atlantic Ridge in the North Atlantic Ocean, where the Eurasian and North American plates are moving apart.
- This movement causes volcanic rift zones, where the Earth's crust is pulled apart and fractured, allowing molten rock or magma to rise and sometimes erupt as lava and/or ash.
- Additionally, Iceland is situated over a hot zone or hotspot, contributing to increased volcanic activity in the region.

How many active volcanos does Iceland currently have:

- Iceland has 33 active volcanoes which have erupted over 180 times in the past 1,000 years. Iceland experiences frequent seismic activity due to its location on the Mid-Atlantic Ridge.
- One of Iceland's most famous volcanoes is Eyjafjallajökull. In 2010, this volcano erupted and caused a massive ash cloud to spread across Europe
- Other famous volcanoes include Hekla, Grímsvötn, Hóluhraun, and Litli-Hrútur (part of the Fagradalsfjall system).

Topic 57. AMBITIOUS COAL TRANSPORT PLANS MAY TEST RAILWAYS

Important for the subject: Geography

Indian Railways' plan to raise the quantum of coal to be transported by rail by at least **400 million tonne (mt)** in the next **eight years** face **congestion** and **logistical challenges**, the **Institute for Energy Economics and Financial Analysis (IEEFA)** said in a report.

Eastern Dedicated Freight Corridor (EDFC):

EDFC with a route length of 1856 km consists of two distinct segments:

- an **electrified double-track segment of 1409 km** between **Dankuni in West Bengal & Khurja in Uttar Pradesh** & an **electrified single-track segment of 447 km** between **Ludhiana (Dhandarikalan) – Khurja – Dadri** in the state of **Punjab, Haryana and Uttar Pradesh**.
- It traverses through **6 states viz. Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand and West Bengal**.
- Eastern Corridor is projected to cater to a number of **traffic streams-coal for the power plants in the northern region of U.P., Delhi, Haryana, Punjab** and parts of **Rajasthan** from the **Eastern coal fields, finished steel, food grains, cement, fertilizers, limestone from Rajasthan to steel plants in the east and general goods**.

Western Dedicated Freight Corridor (WDFC):

- It is a broad gauge corridor that extends for 1,504 kilometers, starting at Dadri in Uttar Pradesh and concluding at Jawaharlal Nehru Port Trust near Mumbai.
- The project is being funded through a soft loan of \$4 billion from the Japan International Cooperation Agency (JICA) under special terms for economic partnership (STEP).
- **Key Locations:** The corridor passes through **Vadodara, Ahmedabad, Palanpur, Phulera, and Rewari**, traversing through the states of **Punjab, Haryana, Rajasthan, Gujarat, and Maharashtra**.

Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL):

- DFCCIL under the **Ministry of Railways** is a **special purpose vehicle** tasked with planning and completion of **3,306 kms of Dedicated Freight Corridors (DFCs)**, consisting of **western freight corridor and eastern freight corridor (1,856 kms)**. The total project cost is estimated at over **₹81,000 crore**.
- The construction of **DFCs project** would enable the decongestion of existing over-saturated paths which, thereby, will effectively improve punctuality of passenger trains.

Topic 58. IT'S TIME TO BANISH FEARS AROUND 'KHESARI DAL' AND RELISH THE NUTRITIOUS LEGUME

Important for the subject: Geography

About Khesari Dal or Grass Pea (*Lathyrus sativus*):

The legume (*Lathyrus sativus*) is also known as **khesari dal** in Hindi, **lang** in Marathi and **laag** in Gujarati.

- It is also known as **cicerchia, blue sweet pea, chickling pea, chickling vetch, Indian pea, white pea** and **white vetch**.
- It resembles **toor dal (pigeon pea)**.
- It is commonly grown for human consumption and livestock feed in **Asia and East Africa**.
- It is **one of the cheapest legumes** and **grows easily in fallow fields**, can be rotated with **any crop** and needs **little to no investment**. It is also **tolerant to drought, salinity** and **water logging** and **resistant to pests and biotic stress**.
- In terms of **nutrition**, **grass pea** has **high levels of proteins**, second only to **soybean**, and even has the **compound L-homoarginine** that is **beneficial to heart health**.

Why was it banned in India:

- It has been infamous for **causing lathyrism**, an **irreversible neurological disease** that **leads to paralysis** of lower limbs.
- Researchers identified the culprit as a **chemical** in the seed, **β -N-oxalyl-L-a, β -diamino propionic acid (β -ODAP)**.
- In **1961**, **India** banned the sale and storage of **grass peas** under the **Prevention of Food Adulteration Act, of 1954**.
- The ban was followed by **all states** except **Madhya Pradesh, Bihar** and **West Bengal**. However, the government **did not ban cultivation** as farmers said it was used as **animal feed**.

New varieties:

- **FSSAI** allowed **incidental presence (2%)** in other grains in **2021**. In **1966**, the **first variety** with **low β -ODAP**, **Pusa 24**, was released for cultivation.
- In **1995**, the government launched an **All India Coordinated Research Project on MULLaRP (Mung bean, Urd-bean, Lentil, Lathyrus, Rajmash and Pea)**, under which the crops are promoted and **high-yielding varieties** are developed.

Topic 59. WHY IS THE ICELAND SO VOLCANICALLY ACTIVE

Important for the subject: Geography

A volcano erupted close to an Iceland power plant after weeks of intense seismic activity southwest of **Reykjavik**

What are volcanoes:

- Volcanoes are **openings or vents** where **lava, tephra (small rocks), and steam erupt onto the Earth's surface**, according to the US Geological Survey.
- They can be **on land or in the ocean** and form when **material significantly hotter than its surroundings, such as magma (underground) or lava (on the surface), ash, and/or gases, erupts onto the Earth's surface.**
- The rise of magma can occur when **tectonic plates move away from each other, move towards each other, or at hotspots inside the Earth**, where magma is heated up, becoming less dense and rising.

What are the different kinds of volcanoes:

- The type of volcano is determined by factors such as the **viscosity of the magma, the amount of gas in the magma, the composition of the magma, and the way the magma reaches the surface**, according to the British Geological Survey.
- There are **two main types of volcanoes: strato volcanoes and shield volcanoes**. **Strato volcanoes** have **steep sides** and a **more cone-shaped structure**, while **shield volcanoes** have a **low profile** resembling a **shield lying on the ground**.
- Additionally, **various volcanic features can form from erupted magma**, such as **cinder cones or lava domes**, along with processes that shape volcanoes.

Why is Iceland so volcanically active:

- Iceland experiences **frequent volcanic activity** due to its **location on the Mid-Atlantic Ridge in the North Atlantic Ocean**, where the **Eurasian and North American plates are moving apart**.
- This movement causes **volcanic rift zones**, where the **Earth's crust is pulled apart and fractured**, allowing **molten rock or magma to rise** and sometimes erupt as lava and/or ash.
- Additionally, **Iceland is situated over a hot zone or hotspot**, contributing to **increased volcanic activity in the region**.

How many active volcanos does Iceland currently have:

- **Iceland has 33 active volcanoes** which have **erupted over 180 times in the past 1,000**

years.

- Iceland experiences **frequent seismic activity due to its location on the Mid-Atlantic Ridge.**
- One of Iceland's most **famous volcanoes is Eyjafjallajökull.** In 2010, this **volcano erupted** and caused a **massive ash cloud** to spread across Europe
- Other famous volcanoes include **Hekla, Grímsvötn, Hóluhraun, and Litli-Hrútur (part of the Fagradalsfjall system).**

Topic 60. VOLCANO ERUPTS IN SOUTHWEST ICELAND AFTER WEEKS OF EARTHQUAKES

Important for the subject: Geography

A volcano erupted close to an **Iceland power plant** after weeks of intense seismic activity southwest of **Reykjavik.** The eruption was only **3-km** from the evacuated **fishing port of Grindavik** on the **Reykjanes peninsula.**

Geography of Iceland:

- **Iceland**, situated just **south of the Arctic Circle** in the **North Atlantic Ocean**, is profoundly shaped by its geography and location on the **Mid-Atlantic Ridge**—a boundary between the **North American** and **Eurasian tectonic plates.** While mostly submerged, this ridge emerges above the ocean surface in the form of **Iceland** itself.
- **Iceland's geological features** include **geysers, glaciers, mountains, volcanoes, and vast lava fields.** It hosts **33 active volcanoes**, the highest count in **Europe.**
- **Human settlement in Iceland** dates back to **874** when **Norsemen**, primarily from **Scandinavia**, established **Reykjavik, the capital.**
- The **Reykjanes Peninsula**, had not seen any volcanic activity for the past 800 years, has experienced **four eruptions in less than three years**, indicating a potential new phase of volcanic activity.
- **Eyjafjallajökull Eruption (2010):** Eyjafjallajökull is a volcano on **Iceland's south coast.** Its two eruptions in 2010 led to an **ash cloud** spreading from **western Siberia** to **North America's eastern seaboard.**

Topic 61. PENINSULAR RIVER BASINS IN INDIA MORE LIKELY TO FACE WIDESPREAD FLOODING THAN TRANSBOUNDARY RIVERS: STUDY

Important for the subject: Geography

Past focus primarily on **localized flooding**, prompting researchers from **IIT Gandhinagar** to study and highlight **widespread floods** in **major Indian river basins**.

Analysis Findings:

- **Mahanadi** and **Narmada basins** had the **most frequent widespread floods** (40 events), tied to seasonal trends influenced by **monsoon patterns** and **heavy rainfall**.
- **River basins in peninsular India** (Narmada, Mahanadi, Godavari, Krishna, Cauvery) show **higher probabilities** of widespread flooding compared to **Ganga** and **Brahmaputra**.
- Narmada (59%), Mahanadi (50%), Godavari (42%), Krishna (38%), Cauvery (19%), Ganga (21%), and Brahmaputra (18%) indicate varying probabilities of widespread flooding.
- Basins experience widespread floods during **monsoon months**, except **Cauvery**, with specific months linked to **heavy rainfall periods** (**July-September** for **Godavari, Mahanadi, and Narmada**).
- **Impact of Widespread Flooding:** Widespread flooding, covering large basin areas, causes **significant losses** compared to **localized flooding**. **Climatic Factors:** Rainfall patterns, monsoon intensity, and atmospheric circulations significantly influence flood occurrences.
- **Climate Change Impact:** With a **warming climate**, the drivers of widespread floods are expected to change in **timing, occurrence, and probability**, signalling **potential alterations in flood patterns**. **Atmospheric rivers** play a **significant role** in these flood events.

Atmospheric River:

- Atmospheric rivers are **long, narrow bands of moisture** in the atmosphere that **extend from the tropics to higher latitudes**. These rivers in the sky can **transport 15 times the volume of the Mississippi River**.
- When that **moisture** reaches the **coast and moves inland**, it rises over the **mountains**, generating **rain and snowfall**.
- Many fire-weary westerners welcome these deluges, but atmospheric rivers can trigger other disasters, such as extreme flooding and debris flows.
- Also called “**Pineapple Express**” storms that carry moisture from **Hawaii** to the **United**

States West Coast are just one of their many flavors.

- The **2018 Kerala floods**, **2022 Pakistan floods** and **lower Mississippi River floods** in **2008, 2011** and **2015–19** have been linked with **atmospheric rivers**.

Topic 62. DANGEROUS ROAD TO THE AMERICAN DREAM, VIA SOUTH AMERICA AND MEXICO

Important for the subject: Geography

People from **India** (Punjab, Haryana and now Gujarat) and **Pakistan** take an **illegal route** to enter **the USA** and **Canada**, that passes through the **jungles of Panama**, risking their lives. The route is called the **‘Donkey route’**.

First stop: Latin America:

- Countries like **Ecuador**, **Bolivia**, and **Guyana** have **visas on arrival** for **Indian citizens**. Some other countries, including **Brazil** and **Venezuela**, give **tourist visas** to **Indians** easily.
- A **migrant’s route** also depends on which countries his agent has **‘links’** in — links to **human trafficking networks**. The nearer a country is to the US border, the more difficult it is to get a visa from India.

Crossing a dangerous forest- Darién Gap:

- From **Colombia** (or any other **Latin American country**), the migrants enter **Panama**. This involves crossing the **Darién Gap**.
- The **Darién Gap** is a geographic region in the **Isthmus of Darién** or **Isthmus of Panama** connecting the **American continents** within **Central America**, consisting of a **large watershed, forest, and mountains** in **Panama’s Darién Province** and the **northern portion of Colombia’s Chocó Department**.
- Risks here include a **lack of clean water, wild animals, and criminal gangs**. Migrants can face **robbery** and even **rape** in this region — crimes committed here go unreported and unpunished.
- **Guatemala** is a big coordination centre on this route. **Migrants** are handed over to new **traffickers** here.

Alternate route:

- There is one more route from **Colombia** that starts from **San Andrés**, to avoid the **forest in Panama**. But it is not much safer.
- From **San Andrés**, migrants take boats to **Nicaragua**, a country in **Central America**. Fishing boats with illegal migrants go to **Fisherman’s Cay**, around 150 kilometres from **San Andrés**.

- From there, migrants are transferred onto another boat to move forward to **Mexico**.

At the US border:

- The **3,140-km border** separating the **United States** and **Mexico** has **fencing**, which the migrants have to jump across. Many choose to cross the dangerous **Rio Grande River**.

A new, safer route:

- There is another easier donkey route- migrants first go to **Europe**, and from there, directly to **Mexico**.
- An **average donkey trip** may cost between **Rs 15 lakh** and **Rs 40 lakh**. But sometimes, the **cost is as high as Rs 70 lakh**.

Topic 63. ANTI-NIXON DEMONSTRATION AT 'BOSTON TEA PARTY'

Important for the subject: History

The “Boston tea party,” which triggered off the American Revolution 200 years ago and subsequently led to the country’s independence from England was reenacted on December 17, 2023 at Boston Harbour and India was the only foreign country which was invited to participate in the bicentennial because of “our common colonial past (The East India Company held both countries in virtual thralldom then) and revolutionary heritage.”

About Boston Tea Party, 1773

- The Boston Tea Party was an **iconic event of the American history**. In this incident entire shipment of tea belonging to the British East India Company were thrown into Boston Harbor by American patriots disguised as Native Indians.
- It was a **political protest against both: a tax on tea (taxation without representation) and the perceived monopoly of the East India Company**.
- Angry mobs and the Sons of Liberty forced ships carrying company’s tea to return to England without unloading. In Massachusetts, however, the Royal Governor was determined to let the ships deposit their cargoes and appropriate duties to be honored.
- **On the night of December 16, 1773, Samuel Adams and the Sons of Liberty boarded these ships in the Boston harbor and threw the chests of tea overboard.**
- The British government reacted harshly to the incident of Boston Tea Party. **The British government decided to punish Boston and the people of Massachusetts with a series of acts which came to be known as the Intolerable Acts or the Coercive Acts of 1774.**

What was American Revolution

- The **American Revolution (1775-83)** was also known as the **United States War of Independence** or **American Revolutionary War**.

- This watershed event was an outcome of the repressive and tyrannous policies (like Mercantilism, excessive taxation, etc.) of Britain in its North American colonies mainly after the second half of 18th century.
- **Thirteen of Great Britain's colonies** (along the eastern seaboard of North America) rebelled in the American Revolutionary War, primarily over representation, local laws and tax issues.
- These Thirteen colonies (New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina and Georgia) **came together to establish the United States of America, which was recognized internationally with the signing of the Treaty of Paris on September 03, 1783.**

Topic 64. FROM GUPTA TO MUGHAL HISTORY OF KRISHNA JANAM STHAN

Important for the subject: History

The Allahabad High Court has ordered a survey of the Shai Idgah mosque The Krishna Janmasthan, the **birthplace of Lord Krishna**, has a rich history dating back **2,000 years**.

- The site, **located in Mathura along the Yamuna river**, gained significance during the **Mauryan era**.
- The **first Vaishnava temple** was likely built in the **1st century CE**, with a grander temple constructed during the **reign of Chandragupta II** around 400 CE.
- **Mahmud of Ghazni's** plundering raids in the **11th century impacted Buddhist and Jain centers but did not destroy Krishna worship**.
- The **decline of temples during the Delhi Sultanate** gave rise to a **new form of Vaishnavism**, propagated by saints like **Nimbarka, Vallabha, and Chaitanya**.
- Under the **early Mughals, religious activity in Braj flourished**, and **Akbar made land and revenue grants to various Vaishnavite sects**. In **1618, Raja Veer Singh Deo** built a **grand temple at the Katra site**.
- In **1650**, the grand temple at Mathura, as **described by French traveler Jean-Baptiste Tavernier**, exhibited a unique octagonal shape and was constructed with red sandstone.
- **Venetian traveller Niccolao Manucci**, visiting in the late 1650s, noted its **impressive height, with a gilded pinnacle** visible from Agra.
- In **1660, Aurangzeb appointed Abdul Nabi Khan** as the **governor of Mathura**, a figure disliked by the Hindu population.
- Subsequently, in **1661-62, Khan constructed the Jama Masjid** at the site where **Sikandar Lodhi had previously destroyed** a temple.

- In 1666, Abdul Nabi Khan dismantled the protective railing erected by Dara Shikoh around the Keshavdev temple.
- In 1669, Aurangzeb issued a royal farmaan ordering the destruction of all Hindu schools and temples, across the Mughal Empire.
- The Kashi Vishwanath temple in Kashi was destroyed after the farmaan was issued. In 1670, he specifically ordered the destruction of Mathura's Keshavdev temple, and sponsored the construction of the Shahi Idgah in its place
- In 1803, Mathura came under the control of the British East India Company. In 1815, the Company auctioned 13.37 acres of land at the Katra Keshavdev site to Raja Patnimal, a wealthy banker from Varanasi.
- The ownership of this land is currently Important for the subject to ongoing litigation, with the Hindu side claiming it included the Shahi Idgah mosque, while the Muslim side disputes this.
- Despite Raja Patnimal's desire to construct a temple on the site, financial constraints prevented its realization. Facing lawsuits related to the land, his descendants sold it in 1944 to industrialist Jugal Kishore Birla.
- In 1951, the Shri Krishna Janmabhoomi Trust was established by Birla to facilitate the construction of a temple at the site.
- Construction commenced in 1953 and was completed in 1983, shaping the temple's current form, situated adjacent to the Shahi Idgah mosque.

Topic 65. BIHAR TO DEVELOP SITA BIRTHPLACE

Important for the subject: History

Bihar to develop Sita birthplace

Bihar Chief Minister Nitish Kumar has launched a Rs 72-crore development plan for Goddess Sita's birthplace at Punaura Dham in Sitamarhi.

What are the mentions of present-day Bihar in the Ramayana:

- The Valmiki Ramayana, the primary source book for many subsequent versions, including Tulsidas's Ramcharitmanas, refers to Sita using four words — Vaidehi, Janaki, Sita, and Mithilapuri. Mithilapuri, an apparent reference to Mithila, connects to Sita's birth story, where she was found in a ploughed field by King Janak in Ramayana.
- According to Valmiki, Ram and Laxman visited various sites in Bihar during their travels with Maharishi Vishwamitra, including Chitrakoot, Saran district, Siddhashram in Buxar, the confluence of Ganga and Sone near Patna, and Ahalya's

ashram (Ahirouri in Mithilapuri).

- Mithila plays a **significant role during Ram and Sita's wedding in the Ramayana**. Valmiki mentions Ram visiting Mithilapuri once, while some later versions claim a visit after his coronation.

Which is the birthplace of Sita in Sitamarhi, the Janaki temple or the Punaura Dham

- Contrary to the **belief that Janaki Sthan in Sitamarhi** was Sita's birthplace, recent research spanning nearly a decade indicated that the **Janaki temple was constructed around 200 years ago based** on a sage's dream.
- The research, relying on Valmiki Ramayan and travelers' accounts, **identified Punaura Dham as Sita's birthplace**.
- The site, comprising a **100-year-old temple, Sitakund, Sita Vatika, and Luv Kush Vatika**, was recommended to the Bihar government and subsequently accepted by the state and central governments for development in the Ramayana Circuit.
- The decision to **develop Punaura Dham** followed conclusive research, refuting the previous **belief in Janaki Sthan**.
- Statistician and historian **Sir William Wilson Hunter's** account in 1877 also acknowledged **Punaura as a contender for Sita's birthplace**, three miles southwest of Sitamarhi.

What is the history of Janakpuri in Nepal

- The **modern name Janakpuri is attributed to Mithilapuri**, a location mentioned in **Valmiki Ramayan**.
- The Indian government, in collaboration with the Nepal government, has incorporated **Janakpuri into the Ramayana Circuit**. Historically, **Janakpur became part of Nepal through the 1816 Indo-Nepal treaty**.
- Notably, **Francis Buchanan Hamilton, a prominent historian on Nepal**, does not document 'Janakpuri,' but references Mithilapuri.

What are some historical references of the present-day Sitamarhi

- According to the **account of the renowned archaeologist Alexander Cunningham**, **Sita-Marhi** is located slightly more than 40 miles northwest of Darbhanga, around 14 miles from the nearest point of the Nepal frontier.
- The area is **bounded on the east by a branch of the Sowrun Nala**, and parts of the village are affected by numerous small streams that converge and flood the region.
- While Sita-Marhi has **some temples dedicated to Sita**, Cunningham notes that the place lacks significant archaeological interest beyond these structures.

What are the Bihar government's plans for Punaura

- The **Punaura Development** plan, based on **information from the board of religious trust**, encompasses the **renovation of the temple**, **creation of a roofed pradakshina path** around it, and the development of Luv Kush Vatika, Sita Vatika, and Sita Kund.
- Additionally, a **meditation mandap** will be established, and a **3-D film** will be screened to depict Sita's life journey.
- The **Mahavir Temple Trust** is set to **construct a Sita temple within Sitakund** with a **budget of Rs 100 crore**, and the project will commence after the inauguration of the Ram temple in Ayodhya in January 2024.

Topic 66. CENTRE LAUNCHES FOREST CERTIFICATION SCHEME TO COUNTER FOREIGN AGENCY

Important for the subject: Schemes

Center launches forest certification scheme to counter foreign agency. The Indian government has **launched the Indian Forest and Wood Certification Scheme (IFWCS)** to **address rising global concerns over deforestation and illicit timber trade**.

- IFWCS will serve as a **national forest certification scheme**, providing an **alternative to foreign private certification agencies** that have operated in India for the past two decades.
- The move follows **concerns raised in a global investigation** by the **International Consortium of Investigative Journalists (ICIJ)** about the **integrity of existing certifications**, affecting the acceptance of Indian products in international markets.
- The new certification scheme is **government-backed** and aims to bring transparency and **trust to forest-based product processes**.
- It covers **sustainable forest management, sustainable management of trees outside forests, and chain of custody to trace the origin of forest products** throughout the supply chain.
- While **certification is not mandatory** for forest divisions, adhering to the newly developed **Indian Forest Management Standards** makes them eligible for certification.
- The IFWCS is expected to **enhance the acceptability of Indian forest-based products in international markets**.
- The scheme will be **overseen by the Indian Forest and Wood Certification Council (advisory)**, involving **various stakeholders**, and managed by the **Indian Institute of Forest Management (overall management of the scheme)**