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Topic 1. CENTRE TO ROPE IN ISRO TO PROVIDE INTERNET IN 80 REMOTE TRIBAL VILLAGES

Important for the subject: Science and technology

The **Ministry of Tribal Affairs** plans to partner with the **Indian Space Research Organisation (ISRO)** to introduce **V-SAT stations** for **Internet services** in approximately **80 tribal villages** across **Jharkhand, Madhya Pradesh, Odisha,** and **Maharashtra.**

- This initiative **aims** to provide **pilot connectivity, including Internet, medical,** and **educational services,** to these **tribal-dominated areas.**

- The proposal was part of a **larger discussion on empowering tribal communities,** which also explored potential projects with other leading institutes like **AIIMS Delhi, IIT Delhi, IIM Calcutta,** and **IISc Bengaluru,** chaired by **Tribal Affairs Minister Arjun Munda**.

V-SAT stations (very small aperture terminal):

- The government plans to collaborate with **ISRO** to establish **V-SAT stations** in **80 geographically remote and difficult-to-access tribal villages, aiming** to overcome **connectivity challenges** these areas face.

- This pilot project, part of a broader **initiative to promote tribal development and e-governance in remote locations,** will be closely monitored for potential expansion to additional **tribal villages across other states.**

- The selection of these **80 villages** across **Jharkhand, Madhya Pradesh, Odisha,** and **Maharashtra** is underway, with the project's specifics to be determined soon.

Other initiatives:

- Additionally, the **Tribal Affairs Ministry** is partnering with **AIIMS Delhi** to advance research on **tribal health issues,** particularly **Sickle Cell Anemia,** and to **organize training for medical staff in tribal regions**.

- There are plans to establish a **Bhagwan Birsa Munda Chair of Tribal Health and Haematology at AIIMS Delhi**.

- Collaborations with **IIT Delhi** and **IIM Kolkata** are also in the works to create a department for **Appropriate Technology and Entrepreneurship,** while a proposal with the **Indian Institute of Science, Bengaluru, aims** to establish a **training facility offering semiconductor courses to tribal students**.

- One other proposal was also tabled to collaborate with the **Indian Institute of Science in Bengaluru** for setting up a **training facility** which will offer courses on **semiconductors to tribal students**.

Topic 2. AI KNOWLEDGE CONSORTIUM FORMED BY 12 ORGANISATIONS

Important for the subject: Science and technology

About AI Knowledge Consortium (**AIKC**)**:**

AIKC, a **coalition of twelve research institutions and think tanks**, has been formed in **Indiato promote a multi-stakeholder approach to AI governance**.

- This initiative underscores the importance of **responsible business practices and societal oversight** in **integrating AI into daily life.**

- The **AIKC's operations** will be coordinated by **Koan Advisory**, a consultancy specializing in assisting foreign businesses with entering the Indian market.

- A report titled **"What Indian Parliamentarians Think of AI,"** which reflects the **views of37 MPs on AI regulation and innovation,** was released alongside the announcement.

- **Key members of the AIKC** include **Aapti Institute, Cyber Saathi, Communeeti, Esya Centre, the Institute for Governance, Policies and Politics,** and the **New Indian Consumer Initiative**.

Mission:

- To elevate AI governance in India, ensuring that the technological revolution trigged by it is inclusive, equitable, and reflective of our shared values and aspirations.

- AIKC collaborate to navigate the challenges and opportunities of AI, towards shaping a resilient future, one which is just, and abundant with possibilities for all.

Foundational Pillars:

- We are guided by **four pillars** that embody our collective aspirations and principles. These serve as the bedrock of our collaboration, weaving together our diverse membership and expertise.

- Together, these pillars frame our collective endeavour, ensuring that our approach is reflective, responsive, and resonant with our values.

- **Pillar 1: Community Empowerment**

- **Pillar 2: Knowledge Stewardship and Research**

- **Pillar 3: Capacity Building**

- **Pillar 4: Inclusive Dialogue and Outreach**

Topic 3. A BOLD STEP TOWARDS A CERVICAL CANCER-FREE FUTURE

Important for the subject: Science and technology

The **interim Union Budget for 2024-25** notably emphasizes **women's health** and a standout feature of the budget is its support for **vaccinating girls aged nine to 14 years against cervical cancer,** representing a crucial step in **enhancing women's health and safety** in the country.

The '90-70-90' targets, global programmes:

- Despite healthcare advances, **cervical cancer** remains a significant challenge in **India**, being the **second most common cancer among women** with over **127,000 cases** and around **80,000 deaths annually.**

- The **human papillomavirus (HPV)** plays a **crucial role** in the **onset of cervical cancer,** prompting the **adoption of HPV vaccination** as a **key preventive measure**.

- The **World Health Organization (WHO)** has set ambitious **'90-70-90′ targets for 2030: vaccinating 90% of girls by age 15, screening 70% of women by ages 35 and 45, and treating 90% of women with cervical cancer.**

- These goals are central to the global effort to **eradicate cervical cancer** and highlight the **critical importance of India's initiative for HPV vaccination.**

- Globally, over **100 countries** have introduced **HPV vaccination programs,** significantly **reducing cervical cancer incidence**.

International and regional efforts:

- Notable examples include **Scotland,** where **fully vaccinated women** born between **1988** and **1996** have shown **no cervical cancer cases,** and **Australia,** which is **on track to eliminate cervical cancer by 2035.**

- **Rwanda's successful vaccination campaign** has markedly **decreased HPV prevalence among women,** demonstrating the **vaccine's effectiveness** in preventing cervical cancer.

- In the **Southeast Asia Region**, **six countries,** including **Bhutan, Indonesia, the Maldives, Myanmar, Sri Lanka,** and **Thailand,** have rolled out **national HPV vaccination programs.**

- **Bhutan,** in particular, has achieved a **95% vaccination rate** among **targeted girls** since introducing the program in **2010** and has **extended vaccination to boys in 2021.** Research in **Bhutan** has shown a **reduction in the prevalence of vaccine-targeted HPV types,** evidencing the program's impact on reducing **HPV transmission within the community**.

- These **international and regional efforts** underscore the **vital role of HPV vaccination in combating cervical cancer**.

The Sikkim model:

- **Sikkim's successful HPV vaccination campaign**, achieving a remarkable **97% coverage in 2018,** showcases the importance of **comprehensive communication strategies in public health initiatives.**

- This approach involved **educating teachers, parents, girls, health-care workers,** and **the media** about the **HPV vaccine's benefits**.

- **India's** development of its **indigenous quadrivalent HPV vaccine, Cervavac,** priced at **₹2,000 per dose** and created by the **Serum Institute of India** in collaboration with the **Department of Biotechnology,** represents a significant advancement in making the vaccine more accessible and affordable.

- The **potential expansion of India's vaccination program** to **include adolescent boys,** alongside recent evidence suggesting that a **single dose of the HPV vaccine may offer similar protection as multiple doses,** points towards a more **comprehensive strategy to combat HPV infections and related diseases.**

- **HPV vaccination's impact extends beyond individual health,** aiming to **reduce the societal and economic burdens of cervical cancer,** which predominantly affects **women in their prime years** and **imposes a heavy toll on families and communities.**

- By preventing **HPV infections,** vaccination not only **decreases the incidence of cervical cancer** and its **associated healthcare costs** but also **promotes the overall well-being and productivity of women,** ultimately benefiting society at large.

Meet the challenges:

- **India** faces challenges such as **vaccine hesitancy** and **ensuring equitable access to vaccination**.

- Addressing these issues requires **engaging with communities, combating misinformation,** and **enhancing healthcare infrastructure.**

- The introduction of **U-WIN,** akin to the **Co-WIN platform, aims to maintain an electronic registry of all immunizations in the country** and **allow for real-time responsiveness in vaccination programs**.

Topic 4. AS BIG TECH SCRAMBLES TO MEET EU RULES, INVESTIGATIONS SEEN AS LIKELY

Important for the subject: Science and technology

The **world's largest tech companies,** including **Google, Apple, Amazon, Microsoft, Meta,** and **ByteDance,** have updated their **core platform services** to **comply with** the **European Union's Digital Markets Act (DMA), aiming to ensure fair competition.**

- However, there's scepticism about the **adequacy of these efforts,** with **potential investigations looming due to possible non-compliance.**

About Digital Marketing Act (DMA):

- The **DMA** represents a **significant regulatory move to control the influence of "Big Tech,"** threatening fines of up to **10%** of **global turnover for non-compliance.**

- **Apple** is notably **impacted by the DMA, required to allow alternative app distribution channels outside its App Store in the EU**.

- However, its introduction of a **"core technology fee"** has **raised concerns among EU antitrust authorities** for potentially **discouraging businesses from switching to competitors.**

- The **EU aims for swift enforcement of the DMA,** contrasting with the typically lengthy antitrust investigations, indicating a rigorous approach to regulating Big Tech's market practices.

Which companies have to follow the rules?

- **DMA** targets **22 services** spanning **operating systems, messenger apps,** and **social media platforms**, aiming to **regulate the largest tech companies**.

- **Services** under **scrutiny** include **Google's Maps, YouTube, Chrome browser,** and **Android OS; Amazon's Marketplace; Apple's Safari browser and iOS; Meta's Facebook, Instagram,** and **WhatsApp;** and **Microsoft's Windows** and **LinkedIn.**

What effect will the rules have globally?

- **DMA** signifies a crucial development by the **European Union** in its role as a **global leader in regulating the tech industry**.

- The **EU** has a history of imposing significant fines on **Google for antitrust violations, establishing stringent social media regulations,** and **introducing pioneering artificial intelligence legislation**.

- Now, countries such as **Japan, Britain, Mexico, South Korea, Australia, Brazil,** and **India** are creating their **DMA-like rules** to **prevent** tech giants from **monopolizing digital markets**.

How will downloading apps change?

- **Apple** has announced it will **allow European iPhone users to download apps from sources outside its App Store,** a significant shift from its previous policy.

- This change is in response to the **Digital Markets Act (DMA)** requirements but comes with a **caution from Apple** about the **potential security risks of "sideloading" apps.**

- Despite reducing the **fees for app developers** who choose to use Apple's payment-processing system in **Europe**, **Apple** is introducing a **50-euro cent fee for each iOS app installed via third-party app stores**.

- Critics argue this could discourage developers of free apps from using alternative app stores, as they would now face a per-user fee, potentially limiting the diversity and appeal of these stores.

How will people get more options online?

- Under the **Digital Markets Act (DMA)**, consumers will **gain more autonomy over their digital choices,** and no longer be bound to **default options for essential services.**

- **Android users** will have the **freedom to select their preferred search engine,** while **iPhone users can choose their default browser.**

- These changes **aim to dismantle the automatic preference for services like Apple's Safari or Google's Search**, with **European users** encountering choice screens on their devices to facilitate this. Additionally, Microsoft will no longer compel users to adopt its **Edge browser**.

- However, **concerns persist among smaller service providers** that these measures may not significantly **alter consumer behaviour.**

How will internet searches change?

- **Google** will **modify how some search results are displayed, eliminating the preferential treatment for its own services**.

- For instance, hotel searches will feature an additional carousel for booking sites like Expedia, while Google Flights will no longer have a dedicated button and will be included among the standard blue link search results. This change **aims to foster a fairer competitive environment online**.

- Furthermore, the **DMA empowers users to have more control over their privacy,** particularly concerning targeted advertising. Google will offer users the **option to prevent their data from being utilized across its various services for ad-targeting purposes.**

- Similarly, **Meta** is introducing measures to **allow users to keep their Facebook and Instagram data separate,** preventing the amalgamation of personal information for advertising.

- Another **significant change** introduced by the **DMA** is the **requirement for interoperability among messaging systems.**

- This means **companies must ensure their messaging apps can communicate with one another.**

- Specifically, **Meta**, owning the **only two chat apps covered by these rules,** is expected to devise a plan enabling **Facebook Messenger** and **WhatsApp users to exchange text messages, videos,** and **images seamlessly,** further **enhancing user choice and flexibility in digital communication platforms**.

Topic 5. 12 SECURITY AGENCIES TO USE INDIGENOUSLY DEVELOPED EXPLOSIVE DETECTORS

Important for the subject: Science and technology

Two indigenously developed explosive detectors have been handed over to the Intelligence Bureau for field deployment by 12 identified security agencies across the country.

- The move is expected to further strengthen the apparatus of the security forces.

- The **Electronics Corporation of India Limited (ECIL), the Department of Atomic Energy (DAE) and the Defence Research and Development Organisation (DRDO)** have developed the explosive detectors for security forces.

About the detectors:

- The detectors, based on **Ion Mobility Spectrometry (lMS**) technique and Raman Backscattering (RBS) principle respectively, have been customized as per specific requirements of the agencies, as part of a development project initiated at the behest of IB in 2017.

- The user agencies have been asked to provide feedback about the field deployment experience of the 2 detectors so that further improvements, if required, can be made.

Topic 6. NOVO VALUATION SURPASSES TESLA ON EXPERIMENTAL OBESITY DRUG DATA

Important for the subject: Science and technology

- **Novo Nordisk's market valuation** has surpassed Tesla and Visa after announcing positive early trial data for a new obesity drug; shares rose over 8% to record highs.

- Shares surged more than **8% to record highs, shooting Novo Nordis**k up in global rankings to the 12th most valuable company from 14 previously.

About the drug:

- Wegovy belongs to a class of drugs known as **GLP-1 agonists, originally designed to treat type 2 diabetes,** that have been shown to reduce food cravings and empty the stomach more slowly.

- **Wegovy was the first of a new group** of highly effective weight-loss drugs to be launched.

- Novo and Lilly are so far the leaders in the obesity drug market, forecast by analysts to be worth $100 billion by 2030.

- **Wegovy** also had a clear cardiovascular benefit, boosting efforts by the company to move Wegovy beyond its image as a lifestyle drug.

Semaglutide

- Semaglutide injection is in a class of medications called incretin mimetics. It works by helping the pancreas to release the right amount of insulin when blood sugar levels are high. Insulin helps move sugar from the blood into other body tissues where it is used for energy.

- Novo Nordisk is the sole patent holder of semaglutide, the active ingredient in both Wegovy and Novo's diabetes drug Ozempic, which are not yet approved for sale in India

- Wegovy, Ozempic and Eli Lilly's Mounjaro and Zepbound belong to a class of therapies known as GLP-1 receptor agonists originally developed to control blood sugar in patients with type 2 diabetes. But they also slow digestion, helping patients feel full longer.

- Indian law allows drugs approved in foreign countries to be imported and sold in the country after obtaining an import license from the drug regulator by the original drug manufacturer's partner in India.

- Novo aims to officially launch Wegovy in India in 2026 after securing regulatory approvals

- Certain provisions of the law also allow drugs that have not been formally approved by the Indian drug regulator to be imported for individual use, provided patients make an appeal with valid prescriptions and proof of identity.

Topic 7. LEAD-ACID BATTERIES MOST SUCCESSFUL EXAMPLE OF CIRCULAR ECONOMY

Important for the subject: Science and technology
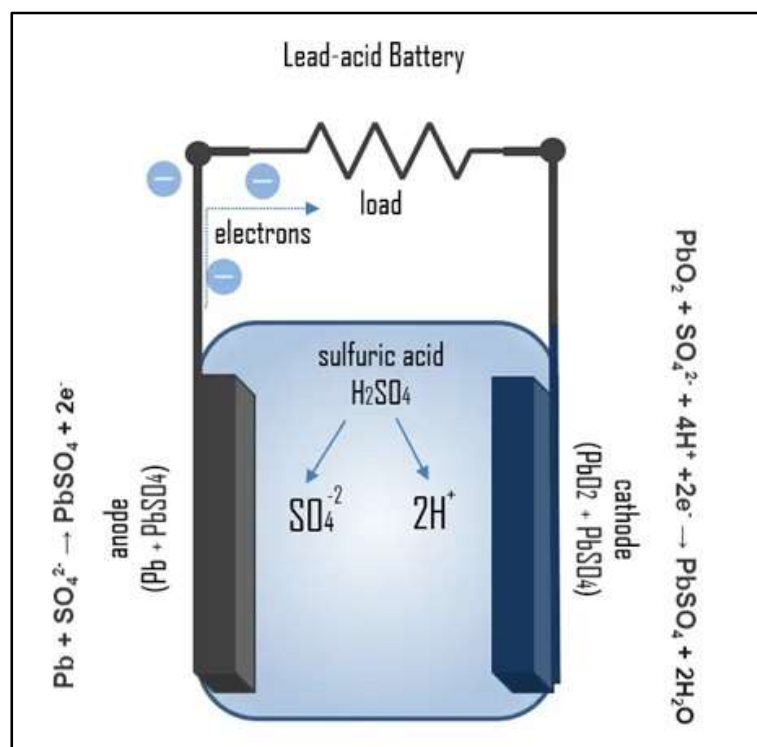
Amara Raja Energy & Mobility Limited is among the largest lead-acid battery manufacturers in India, clocking in a revenue of over Rs 10,000 crore in FY23.

What is a lead acid battery?

- A **lead acid battery is a rechargeable battery** that uses lead and sulphuric acid to function.

- The lead is submerged into **the sulphuric acid to allow a controlled chemical reaction.**

- This chemical reaction is what causes the **battery to produce electricity.**

- Then, this reaction is **reversed to recharge the battery.**

- The main benefit of the **lithium-ion technology is its far superior energy density.**

- The lead-acid battery and its ecosystem is the most successful example of a **circular economy– 99 per cent of a lead-acid battery is recyclable and can be brought back in as raw materials.**

Lead-Acid vs Lithium-Ion Batteries

Features	Lead-Acid	Lithium-Ion Batteries
The Materials Used	• In a lead-acid battery, lead is used as the anode, and lead oxide is used as a cathode. • Lead-acid batteries use sulphuric acid as an electrolyte	• In a lithium-ion battery, carbon is used as the anode, and lithium oxide is used as the cathode. • Li-ion batteries use lithium salt as an electrolyte.
Cost	• Lead-acid batteries are cheaper and are easier to install when compared to Lithium-ion batteries.	• The price of a lithium-ion battery is two times higher than a lead-acid battery with the same capacity.
Cycle life	• A lead-acid battery lasts for 300 to 500 cycles. The complete discharge of the battery significantly affects its life cycle.	• Usually, lithium-ion batteries possess a cycle life of 5000, and complete discharge does not affect the life cycle.

Cost

• Lead-acid batteries are **cheaper and are easier to install when compared to Lithium-ion batteries.**

• The price of a **lithium-ion battery is two times higher than a lead-acid battery** with the same capacity

Cycle life

• **A lead-acid battery lasts for 300 to 500 cycles.**

• The complete discharge of the **battery significantly affects its life cycle.**

• Usually, **lithium-ion batteries possess a cycle life of 5000**, and complete discharge does not affect the life cycle

Battery Capacity

• Battery capacity is the amount of energy stored in a battery per unit volume.

• It is a **direct indicator of the active material stored inside the battery.**

- **Lithium batteries have higher battery capacity when compared to lead-acid batteries.**

Energy Density or Specific Energy

- **Energy density** is a significant factor in determining the type of battery needed for a specific application.

- It indicates the relation between battery capacity and the weight of the battery.

- **Energy Density = (Nominal Battery Voltage (V) x Rated Battery Capacity (Ah)) ÷ Weight of Battery.**

- Lithium batteries have high specific energy when compared to lead-acid batteries.

- **Hence, Li-ion batteries are used in EV applications**

Charging time:

- If a lead-acid battery takes **eight hours to charge, a lithium-ion battery would probably take less than two hours to charge, provided they both have the same capacity.**

Weight and Size

- The **energy density and battery capacity value of lithium batteries are high when compared to lead-acid batteries.**

- Therefore, the **weight and size of lithium batteries are much lower in comparison to lead-acid batteries with the same capacity.**

Depth of Discharge (DOD)

- The depth of discharge is 50% for lead-acid batteries, and 80% for lithium batteries, respectively.

- This means you can use the lithium-ion battery for a longer period without recharging.

- The modern li-ion battery that is manufactured today is even more efficient, with a DOD of 100%.

Topic 8. OVERCOMING THE ORETICAL LIMITS ON SOLAR CELL CAPACITY

Important for the subject: Science and technology

Photovoltaics and solar cells:

Photovoltaics is a study focusing on the **conversion of light energy into electrical energy**.

- **Solar cells,** which are key devices in **photovoltaics,** harness the energy from the Sun, Earth's primary light and energy source.

- **Solar cells** are comprised of **semiconducting materials**, such as **doped silicon,** that facilitate this energy conversion.

How Solar Cells Work:

- **Sunlight** interacting with **semiconductor sex cites electrons** from a lower-energy valence band to a higher-energy conduction band, leaving behind a **"hole"** in the valence band.

- A hole represents a vacant site with a positive charge due to the absence of an electron.

- The **transition of electrons** and the **creation of holes generate electron-hole pairs,** essential for creating photocurrent in semiconductors.

The Shockley-Queisser Limit:

- It is a theoretical concept that defines the **maximum efficiency potential of a solar cell to produce electricity.**

- Named after **Physicists William Shockley (U.S.)** and **Hans-Joachim Queisser (Germany).**

- Factors such as **transparency loss (~25%)** and **thermalisation (~30%) limit** the **maximum efficiency of solar cells**.

- **Modern solar cells convert only about a third of the incident solar energy into electrical energy**.

Challenges and Innovations:

- **Semiconductors** struggle to utilize **photons** with either **insufficient energy** to overcome the **band gap** or those with **excess energy** that **merely heats the device.**

- Efforts to surpass the **Shockley-Queisser limit** include **carrier multiplication** (allowing a photon to create multiple electron-hole pairs) and **hot carrier extraction** (capturing high-energy photons before they convert to heat).

- **South Korean physicist Young Hee Lee** highlights these methods as promising pathways to **enhance solar cell efficiency**

Topic 9. FBR AND ENERGY SECURITY

Important for the subject: Science and technology

India's FBR programme

India's Fast Breeder Reactor (FBR) program, initiated **two decades ago**, **aims** to develop **comprehensive nuclear fuel cycle capabilities,** including **electricity production** from **uranium** in nuclear power reactors.

- In **2003**, under Prime Minister Atal Bihari Vajpayee, **Bharatiya Nabhikiya Vidyut Nigam Ltd (BHAVINI)** was established to construct and operate the **Prototype Fast Breeder Reactor (PFBR),** marking **India's most advanced nuclear reactor project.**

- Initially projected to complete by September 2010, technological challenges led to delays, with the latest completion target set for October 2022.

- Upon completion, **India will become the second country, following Russia, to have a commercial operating FBR,** positioning it **ahead of China's smaller fast breeder program**.

- Programmes in countries such as **Japan, France, and the United States** were shut down amid safety concerns.

From 'fertile' to 'fissile'

- **India's Department of Atomic Energy (DAE)** has devised a **three-stage power program aimed** at harnessing the country's abundant **thorium reserves** to generate electricity.

- These **thorium reserves** are located in **coastal and inland placer sands across various states,** including **Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Maharashtra, Gujarat, Jharkhand,** and **West Bengal.**

- **Placer deposits, naturally concentrated by gravity**, **contain valuable minerals** such as **thorium (from monazite ore), gold, platinum, titanium, uranium,** and **rare earth elements.**

- The vision for this nuclear power program, ensuring **energy security,** was developed by **Dr. Homi J Bhabha** and **Dr. Vikram Sarabhai.**

- They recognized the significance of **Fast Breeder Reactors (FBRs)** which generate more nuclear fuel than they consume by **converting fertile isotopes into fissile material.**

- The program is structured in **three stages,** focusing on **converting 'fertile' material into fissile material.**

- For instance, **uranium-238** is converted into **plutonium-239** within nuclear reactors, and **thorium-bearing monazite** is transformed into **fissile uranium-233.**

- **India** follows a **"closed fuel cycle" strategy, reprocessing spent fuel to separate useful isotopes (Pu239 and U233) for further use,** which is crucial for multiplying the fissile inventory and eventually leveraging thorium in the program's third stage.

- The **FBR** plays a vital role in this transition, setting the foundation for the full utilization of thorium resources.

Three stages and FBR

- **The first stage –** the setting up of **Pressurised Heavy Water Reactors (PHWRs)** and associated **fuel cycle facilities** — is in progress.

- **PHWRs** are reactors that use natural uranium as fuel and heavy water (deu-terium oxide) as coolant and moderator.

- **Nuclear Power Corporation of India Ltd** operates **22 commercial reactors** with an installed capacity of 6,780 MWe.

- The programme has been supplemented by construction of imported **Light Water Reactors (LWRs)** – the first of two units built with Russian collaboration is already generating power.

- **The second stage** involves the setting up of **FBRs** backed by **reprocessing plants** and **plutonium fabrication plants,** primarily to multiply the inventory of fissile material.

- **The third stage** will be based on the **Th-U233 cycle**.

- For producing **U233,** obtained by **irradiation of thorium** in **PHWRs** and **FBRs,** an **Advanced Heavy Water Reactor (AHWR)** is proposed.

- The combination of power reactors from **all the three stages** is expected to ensure **long-term energy security for the country.**

- But the **commercial utilisation of thorium** on a significant scale can begin **only when abundant supplies of either U233** or **Pu239 are available**.

Way forward hereafter

- The **Fast Breeder Reactor (FBR)** will start its operations using a **Uranium-Plutonium Mixed Oxide (MOX) fuel,** surrounded by a **U238 'blanket'** that will **produce additional fuel through nuclear transmutation**.

- The **India-US civil nuclear deal** has further facilitated the process, allowing India to **import uranium for domestic reactors** and thereby accelerating the nuclear program.

Topic 10. PANEL RECOMMENDS BAN ON 'FEROCIOUS DOGS'

Important for the subject: Science and technology

An expert committee constituted by the **Department of Animal Welfare and Husbandry, Ministry of Agriculture**, has recommended that certain breeds of "ferocious dogs" be prohibited from being kept as pets.

- An official letter has gone out from the department to all States listing out these dog breeds as well as instructions to no longer register licenses that permit their sale.

- The expert committee was constituted after citizen groups complained of attacks on people, sometimes fatal by these dogs.

- The High Court, in December 2023 had said it would decide on the issue "in three months."

Ferocious Dog breeds:

- The breeds include mixed and cross breeds like **Pitbull Terrier, Tosa Inu, American Staffordshire Terrier, Fila Brasileiro, Dogo Argentino, American Bulldog, Boerboel, Kangal, Central Asian Shepherd Dog, Caucasian Shepherd Dog, South Mastiffs, Rottweiler, Terrier, Rhodesian Ridgeback, Wolf Dogs, Canario, Akbash dog, Moscow guard dog, Cane corso and dogs commonly classified as Bandog.**

Topic 11. MEET DEVIN AI: THE WORLD'S 'FIRST FULLY AUTONOMOUS' AI SOFTWARE ENGINEER

Important for the subject: Science and technology

US-based applied AI lab, Cognition, has introduced what it claims is the world's first AI software engineer.

- The makers say that the **AI agent, named Devin**, has passed practical engineering interviews held by leading AI companies.

- It has also completed real jobs posted on Upwork, an US-based freelancing platform, according to Cognition.

- **A first of its kind, Devin AI has the ability of taking a simple command and turning it into a functioning website or software program**, Cognition, backed by the Founders Fund.

What can Devin do?

- The **AI agent comes with some advanced capabilities in software development, including coding, debugging, problem-solving, etc.**

- **Devin uses machine learning algorithms** to constantly learn and improve its performance and adapt according to new challenges.

- Devin can build and deploy apps end-to-end and can also train and fine-tune its own AI models.

- Devin can plan and execute complex engineering tasks that would require thousands of decisions.

- The makers have also endowed the AI software engineer with the ability to proactively collaborate with the user. It reports progress in real-time, is capable of accepting feedback, and works along with the user through design choices as needed.

What about its performance?

- **On the SWE-Bench benchmark (a benchmark for evaluating large language models on real-world software issues found on GitHub)**, Devin correctly resolved 13.86 per cent of the issues without any assistance compared with the 1.96 per cent unassisted and 4.80 per cent assisted of the previous state-of-the-art model.

- In terms of performance, **Devin AI is capable of augmenting efficiency** and speed within software development processes by automating repetitive tasks, instantly generating code, expediting project timelines, and cutting down development expenses substantially.

- One of the most notable facets of Devin AI is that it is immune to human errors or inconsistencies.

- The **AI agent is capable of guaranteeing precision and uniformity** in coding practices which can lead to the development of superior-quality software products.

Topic 12. TRI-SERVICE EXERCISE 'BHARAT SHAKTI' TO DEMONSTRATE PROWESS OF INDIGENOUSLY MANUFACTURED EQUIPMENT

Important for the subject: Science and technology

The **integrated tri-service exercise 'Bharat Shakti' at Pokhran field firing ranges in Rajasthan's Jaisalmer district on March 12** will showcase the shock and awe, maneuver and fighting capabilities of the armed forces.

- **Mega exercise 'Bharat Shakti' to be held at Pokhran on March 12** is expected to be witnessed by Prime Minister Narendra Modi along with the top military brass and will showcase the **"shock and awe"** impact that the armed forces seek to achieve in an operational situation with maneuver and fighting capabilities.

About Bharat Shakti:

- 'Bharat Shakti' will demonstrate the prowess of indigenously manufactured defense equipment of the three services.

- The proceedings will commence with the **Army's Special Forces, MARCOS of the Indian Navy and GARUDS of the Indian Air Force.**

- The integrated tri-service firepower and maneuver exercise at Pokhran will be held for about 50 minutes.

- **LCA Tejas, ALH Mk-IV, LCH Prachand, mobile anti-drone system, BMP-II and its variants, NAMICA (Nag Missile Carrier), T90 tanks, Dhanush, K9 Vajra and Pinaka rockets** are among the platforms that will be demonstrated.

- The first-of-its-kind exercise on such a scale is "not tailored towards any direction (northern or western border) or any adversaries".

- Various types of Radar, UAV-launched precision-guided munition, Quick Reaction Fighting Vehicles, and drones of various types, including logistic drones and swarms of drones, and 3D-printed bunkers will be part of the exercise.

- The global share in Indian armed forces capability development projects has steadily declined, whereas the share of the domestic component has increased considerably.

- Pokhran is a remote location in the **Thar Desert of Rajasthan's Jaisalmer district.**

- With the approval of the then prime minister Indira Gandhi, the Test Range in Pokhran hosted the detonation of **India's first nuclear device in 1974.**

- The test was known as a "**Peaceful Nuclear Explosive**" among government officials. After the detonation, it came to be known as **Operation Smiling Buddha** while the MEA called it "Pokhran I".

- The Bhabha Atomic Research Centre preferred to conduct the tests in the **remote desert of Rajasthan due to the topography and the weather of the region.**

- The test was conducted during the month of May when the wind in the region created **serious sandstorms.** The sandstorms obstruct a clear view to **American spy satellites.**

- Also, the **infrared sensors do not pick up such activity due to the temperature that increases over 50 degrees during the daytime.**

- To maintain the secrecy of the test the Bhabha Atomic Research Centre conducted the nuclear test in Pokhran.

- After conducting the test, the government announced that it did not intend to manufacture nuclear weapons but just wanted to make India self-reliant in nuclear technology.

- Twenty-four years after the first test was conducted, the Indian Defence Research and Development Organisation and Atomic Energy Commission conducted five more nuclear tests on May 11, 1998.

About LCA Tejas:

- The Light Combat Aircraft(LCA) programme was started by the Government of India in 1984 when they established the **Aeronautical Development Agency (ADA)** to manage the LCA programme.

- It replaced the aging Mig 21 fighter planes.

- Designed by –Aeronautical Development Agency under the Department of Defence Research and Development.

- Manufactured by -State-owned **Hindustan Aeronautics Limited(HAL).**

- **It is t**he lightest, smallest and tailless multi-role supersonic fighter aircraft in its class.

About LCH Prachand:

- The Indian Air Force formally inducted the indigenously developed **multi-role Light Combat Helicopter (LCH)**, Prachanda which is suitable for operating in high-altitude battlefields.

About NAMICA:

- Nag is a **third-generation, fire-and-forget**, anti-tank guided missile developed by India's state-owned Defence Research and Development Organisation (**DRDO**) to support both **mechanized infantry and airborne forces** of the Indian Army.

- It is an all weather condition with day and night capabilities and with a **minimum range of 500m and maximum range of 4 km.**

- Nag can be launched from land and air-based platforms. The land version is currently available for integration on the Nag missile carrier (NAMICA)

About T90 tank:

- The T-90 is a **third-generation Russian** main battle tank developed to **replace the T-72**.

- It uses a **125 mm 2A46 smoothbore main gun**, the 1A45T fire-control system, an upgraded engine, and gunner's thermal sight.

About K9 Vajra:

- The K9 VAJRA-T **155mm/ 52 is a tracked self-propelled howitzer** (a short gun for firing shells on high trajectories at low velocities), which has its roots in the **K9 Thunder**, the mainstay of the **South Korean Army.**

- It offers a high rate of fire at long-range and is compatible with Indian and standard North Atlantic Treaty Organisation (NATO) ammunition.

- The K9 Thunder platform is made of **all-welded steel armor protection material.**

About Pinaka:

- The Pinaka, which is primarily a **multi-barrel rocket system (MBRL)** system, can fire a salvo of 12 rockets over a period of 44 seconds.

- In the battlefield, long range artillery systems like Pinaka are used for attacking the adversary targets prior to the close quarter battles which involve smaller range artillery, armoured elements and the infantry

- The development of the Pinaka was started by the Defence Research and Development Organisation (**DRDO**) in the late 1980s, as an alternative to the multi-barrel rocket launching systems of Russian make, called the 'Grad', which are still in use

Topic 13. WHY INDIA URGENTLY NEEDS A LEGAL FRAMEWORK FOR GENOMICS

Important for the subject: Science and technology

Advances in Genomics:

The past two decades have witnessed remarkable progress in **genomics,** highlighted by the **ability to sequence, analyze,** and **interpret genomes on an unprecedented scale**.

- The **dropping costs of sequencing** forecast a **surge in clinical genome sequencing applications. Population-scale genome programs worldwide** are laying the groundwork for a **significant shift in healthcare and research.**

India's Progress:

- **India**'s journey in **human genomics** began with its **first genome sequencing** in **2009,** reaching **1,000 genomes by 2019**, and recently completing **10,000 genomes.**

- These milestones have provided valuable insights into **population-specific diseases, prevalence rates,** and have underpinned **decision-making and research acceleration**.

Challenges and Opportunities:

- Given **India's vast, diverse population of over 1.4 billion,** there is a **critical need for ambitious and practical strategies** to **ensure genomics benefits reach everyone.** This requires **large-scale sequencing efforts,** a **robust legal and policy framework,** and **active industry participation.**

- Establishing a legal framework for data protection is urgent. While the **Health Ministry Steering committee clearances** are required for **research collaborations**, the **Director General of Foreign Trade notification enables samples to cross borders for commercial purposes**, leading to **foreign entities conducting research on Indian samples without significant local oversight.**

- **Genetic testing services** in **India** operate in **silos**, creating **fragmented genetic data pools.**

- **Aggregating test results** could **enhance public health decisions** but **lacks a system for collection and analysis, hindering accessibility for health policy-making.**

- The **potential for genetic information discrimination exists without laws to prevent it,** affecting **insurance and societal treatment**.

- Moreover, market forces may **exacerbate healthcare access disparities,** particularly **affecting the poor and ethnic minorities**. **Ensuring diversity in genetic data** is **essential** to avoid exacerbating healthcare inequalities.

- **Ethical usage** of **genomics is crucial.** This includes **evidence-based application, ensuring test quality,** and **preventing misuse.**

- Countries have **developed guidelines and policies for ethical genomics use,** a model **India** needs to adopt supported by legal measures.

The Role of Policies:

- Effective regulations and clear policies are vital for **advancing human genomics ethically and equitably.**

- They **foster trust, encourage collaboration, and support innovation,** aligning with **societal needs to maximize healthcare benefits** from genomics.

- **India** has the **potential to lead in making genomics accessible on a massive scale,** offering significant health and quality of life improvements. Achieving this requires **proactive efforts in policy-making, regulation,** and **ensuring ethical and equitable use of genomics technologies**.

Topic 14. ALL ABOUT INDIA'S INDIGENOUS FIFTH-GEN FIGHTER JET ADVANCED MEDIUM COMBAT AIRCRAFT (AMCA), AND WHY IT IS IMPORTANT

Important for the subject: Science and technology

The **Cabinet Committee on Security (CCS)** this week cleared a Rs 15,000 crore project to design and develop the **Advanced Medium Combat Aircraft (AMCA), India's fifth-generation fighter multirole fighter jet.**

- The **Aeronautical Development Agency (ADA)** under the **Defence Research and Development Organisation (DRDO)** will be the nodal agency for executing the programme and designing the aircraft.

- It will be manufactured by **state-owned Hindustan Aeronautics Limited (HAL).**

- The aircraft will put India in a select group of nations that have their own **fifth-generation fighter aircraft.**

Features of AMCA

STEALTH:

- The **25-tonne twin-engine aircraft**, which will be bigger than other fighters in the Indian Air Force inventory, will have advanced stealth features to avoid detection by enemy radar.

FUEL & WEAPONS:

- The aircraft will have a large, **concealed internal fuel tank of 6.5-tonne capacity**, and an **internal weapons bay for a range of weapons, including indigenous weapons**, to be buried in its belly.

ENGINE:

- The AMCA Mk1 variant will have the **US-built GE414 engine of the 90 kilonewton (kN) class, while the more advanced AMCA Mk2** will fly on the more powerful 110kN engine, which will be developed indigenously by **DRDO's Gas Turbine Research Establishment (GTRE)** in collaboration with a foreign defense major.

- Other features such as a diverterless supersonic inlet for controlling air flow into the engines, and a serpentine air intake duct to shield the engines from radar emissions, are likely to be part of the AMCA.

Why AMCA is special

- The initial plan was to jointly develop the aircraft with **Russia under a Fifth Generation Fighter Aircraft (FGFA) programme.**

- India withdrew from the **FGFA project in 2018.**

- The AMCA will be **India's indigenous fifth-generation fighter aircraft.**

- The indigenous **Light Combat Aircraft (LCA) Tejas is a 4.5-generation single-engine multirole aircraft.**

- Stealth features such as an internal weapons bay and a bigger internal fuel tank are part of **fifth-generation aircraft like AMCA.**

- External fuel tanks and externally attached weapons leave a huge signature and are easy to detect for radar.

- This will be aided by the inclusion of a **comprehensive Integrated Vehicle Health Management (IVHM) system** to keep track of multiple structural components, and to assess the condition of the aircraft in real-time.

Other fifth-generation fighters

- Only a few countries have built a **fifth-generation stealth fighter aircraft.**

- The list of the aircraft currently in service includes the **F-22 Raptor and F-35A Lightning II of the US, the Chinese J-20 Mighty Dragon, and the Russian Sukhoi Su-57.**

Topic 15. IN GUJARAT, HARNESSING THE VALUE OF DUNG TO BOOST FARMERS' INCOME

Important for the subject: Science and technology
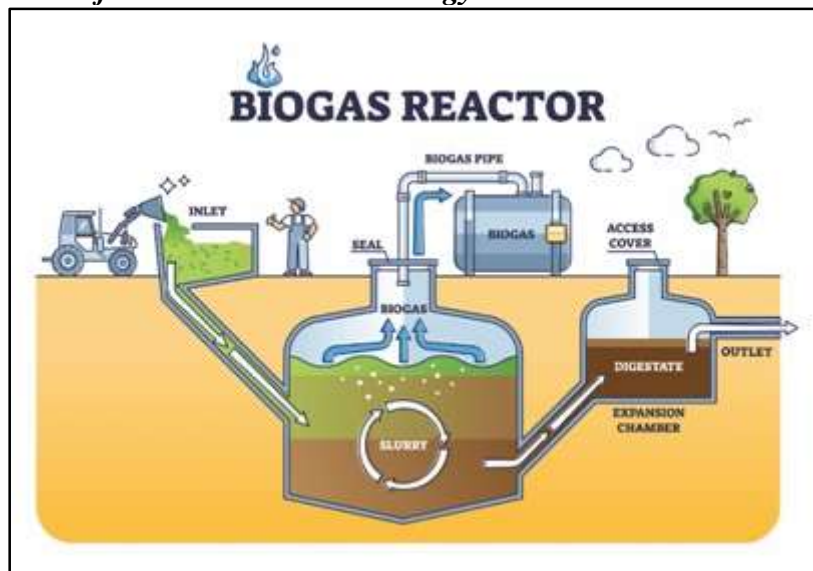
Gujarat's dairy cooperatives** are showing the way in supplementing their farmers' income from milk by procuring **dung and converting it into Bio CNG and fertilizer.**

- **Deesa-Tharad highway in Gujarat's Banaskantha district**, catering to 90-100 vehicles daily, is India's first and only gas-filling station based on dung from cattle and buffaloes.

Dung facts

- From 40 tonnes of dung, we get 2,000 cubic meters of raw biogas containing **55-60% methane, 35-45% CO2, and 1-2% hydrogen sulfide (H2S) and moisture**

About Biogas plant:

- A biogas plant requires fresh dung, which contains **methane along with water.**

- The methane is produced by bovines inside their **rumen (first of four stomach compartments), where the plant materia**l they eat gets fermented or broken down by microorganisms before further digestion.

- **Carbohydrate fermentation leads to production of carbon-dioxide (CO2) and hydrogen.**

- These are used by **archaea (bacteria-like microbes in the rumen) to produce methane**, which the animal expels either as gas or in the dung.

- The dung left to dry in the open releases both **water and methane.**

- To realize its fuel value, the dung has to, therefore, be collected and delivered in fresh form at the biogas plant.

Fuel plus fertilizer:

- The raw dung unloaded at the BioCNG plant is mixed with an equal quantity of water. The resultant slurry is then pumped into an anaerobic digester.

- **Anaerobic digestion is a process by which the complex organic matter in dung is broken down in the absence of oxygen to produce biogas**

The digestion involves four successive stages:

- hydrolysis (break-down of organic matter into simple molecules), acidogenesis (their conversion into volatile fatty acids), acetogenesis (production of acetic acid, CO_2 and hydrogen) and methanogenesis (biogas generation).

What is Biogas?

- It mainly comprises hydro-carbon which is combustible and can produce heat and energy when burnt.

- Biogas is produced through a biochemical process in which certain types of bacteria convert the biological wastes into useful bio-gas.

- Since the useful gas originates from a biological process, it has been termed as bio-gas.

Methane gas is the main constituent of biogas.
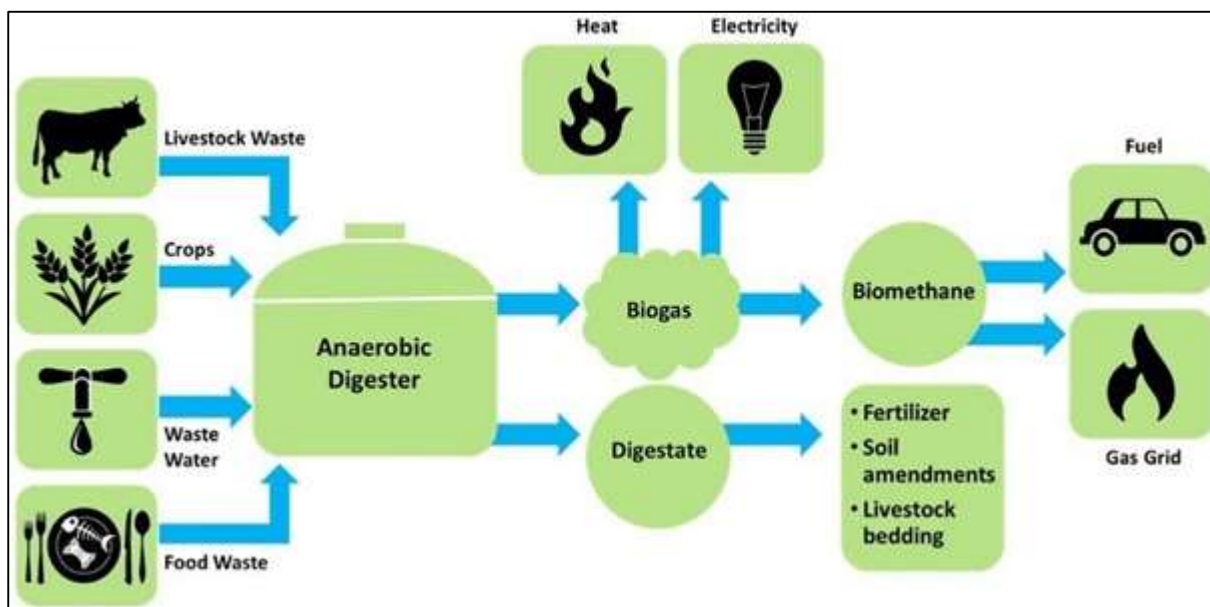
Purification of Biogas:

- The raw gas is purified for removing **CO2 (through vacuum pressure swing adsorption or VPSA process), H2S (using activated carbon filter) and moisture (with air dryer separator).**

- The end-product, **purified (to 96-97% methane, 2-3% CO2 and below 0.1% H2S and moisture) and compressed, is stored in cascades.**

- This **compressed biogas (CBG)**, conveyed through pipelines to the dispensers at the fuel station, is what's being sold as **BioCNG at Rs 72/kg.**

Topic 16. MEET PI, THE WORLD'S 'FRIENDLIEST' CHATBOT POWERED BY THE NEW INFLECTION-2.5 LLM

Important for the subject: Science and technology

In less than a week, two Large Language Models (LLMs) have been launched that are closer to or even better at tasks than OpenAI's GPT-4.
- After Anthropic's Claude 3 captured the attention of the AI community, Inflection AI launched its latest LLM, Inflection 2.5 which is an upgrade to its model that powers its friendly chatbot Pi personal assistant.

- Inflection AI, a California-based AI startup founded by former co-founders of DeepMind and LinkedIn, introduced Pi, their personal AI, in May 2023.

What is Inflection 2.5?

- **Inflection-2.5** is an upgraded in-house model that is competitive with all the **world's leading LLMs like GPT-4 and Gemini.**

- The company claims that the newly upgraded **LLM comes with its signature personality and uniquely empathetic fine-tuning**.

- The company claims that its latest model achieved **GPT-4's performance with only 40 per cent of the OpenAI model's computation power for training.**

- With the new upgrade, Pi has now been endowed with world-class real-time web search capabilities to ensure that users get access to high-quality and up-to-date information in real-time.

What is the Pi chatbot?

- Pi is an AI chatbot with which one can have deep and meaningful conversations.

- Pi was launched at a time when the world was marveling at **OpenAI's sensational ChatGPT.**

- While ChatGPT offered human-like responses, Pi came with a radically different vigour.

- Pi is more humane and has been promoted as a chatbot that has a personality.

- Inflection AI dubbed it as a chatbot that is **"supportive, smart, and there for you anytime".**

- While ChatGPT and Gemini were mostly personal assistants that were useful at work, Pi is more like a companion to humans and is free to use.

- The chatbot comes with a voice, in six distinct voices, to choose from adding life to conversations.

- On the technical side, for training purposes, **the chatbot has been shown billions of lines of text on the open web.**

- Incidentally, the name **Pi stands for personal intelligence and it offers infinite knowledge according to a user's need.**

- Upon its launch, Pi was powered by **Inflection's proprietary LLM Inflection-1 which was trained on thousands of NVIDIA H100 GPUs on a very large data set.**

- Based on the evaluations, Inflection-1 was ranked the best model in its compute class outdoing the likes of GPT-3.5, LLaMA, and PaLM-540B on a wide range of benchmarks. In 2022, the company launched its new model Inflection-2, which was trained on 5,000 NVIDIA H100 GPUs.

- Inflection-2 outclassed Google's flagship LLM PaLM 2 on various benchmarks including MMLU (massive multitask language understanding), TriviaQA (a realistic text-based question-answering dataset), HellaSwag& GSM8k.

How is Inflection-2.5 different?

- With the upgraded **language model Inflection-2.5**, the company has enhanced the emotional quotient of the Pi chatbot.

- **Inflection-2.5 also outperforms its predecessor Inflection-1 on the MMLU** benchmark and performs at the **85th percentile of human test-takers on the Physics GRE.**

- **Inflection-2.5 retains the Pi chatbot's** unique persona along with maintaining extraordinary safety standards.

- The model achieves this all the while making the chatbot a more **helpful model across the board.**

Topic 17. SPECIALIZED CYLINDERS FOR HYDROGEN STORAGE

Important for the subject: Science and technology

The Ministry of New and Renewable Energy (MNRE) plans to convene a meeting with relevant stakeholders to discuss the **development of specialized cylinders for green hydrogen storage**.

Background and Challenges:

- **Commercial Vehicle Manufacturers Concerns**: Manufacturers of commercial vehicles, including heavy-duty and long-haul trucks, have raised concerns about challenges related to **high-pressure storage cylinders in adopting green hydrogen as a sustainable fuel**.

- **Cost Challenges**: High-cost factors associated with green hydrogen fuel cells

Types of Cylinders:

- **Categorization**: Gas cylinders are categorized into four types based on the materials used.

- **Suitability for Hydrogen**: **Type 1 and Type 2 cylinders are suitable for storage, while Type 3 is preferred for storage and transportation. Type 4 cylinders are recommended for onboard storage.**

- **Pressure Differences**: Hydrogen is stored at a much higher pressure compared to compressed natural gas (CNG). **Hydrogen storage pressure ranges between 5,000-10,000 psi.**

Meeting Discussions and Plans:

- MNRE aims to hold a meeting with industry stakeholders to **develop Type 3 and Type 4 cylinders to address challenges related to high-pressure hydrogen storage.**

- **Carbon Fiber Reinforcement**: Type 3 and Type 4 cylinders are **reinforced with carbon fiber, making them lightweight and suitable for use in vehicles.**

- **Manufacturing Challenges**: Manufacturing high-pressure Type 4 hydrogen **cylinders involves a slightly more complex process compared to CNG cylinders, adding to production costs.**

- **Domestic Companies' Plans**: Companies like Confidence Petroleum India Limited, Time Technoplast Limited, INOX India Limited, and Indoruss Synergy Private Limited are planning to manufacture Type 4 cylinders for hydrogen storage.

- **BHEL's Initiatives**: Bharat Heavy Electricals Limited (BHEL) is working on setting up a Center of Excellence for hydrogen storage cylinders and fuel cell technologies in collaboration with the Ministry of Heavy Industries.

- **OEM Concerns**: Original Equipment Manufacturers (OEMs) such as Volvo Eicher, Ashok Leyland, and Tata Motors **flagged concerns about the high cost of hydrogen fuel cells.**

- **Bosch's Developments**: Bosch, a company that started volume production of fuel cell modules in 2023, is **developing hydrogen combustion engines for retrofitting diesel buses and trucks**.

Conclusion:

- The meeting with MNRE and stakeholders aims to address **challenges related to high-pressure hydrogen storage cylinders.** The development of Type 3 and Type 4 cylinders is crucial for the adoption of **green hydrogen as a sustainable fuel** in the transport sector.

- Domestic companies and OEMs are actively involved in developing technologies and manufacturing cylinders for hydrogen storage, indicating a growing interest in hydrogen-powered vehicles for the clean energy transition.

National Green Hydrogen Mission

- The National Green Hydrogen Mission in India is a significant initiative aimed at **positioning the country as a global leader in the production, use, and export of green hydrogen.**

Objectives:

Development of Green Hydrogen Production Capacity:

- Target of producing at least 5 Million Metric Tonnes (MMT) per annum of green hydrogen.

Renewable Energy Capacity Addition:

- Addition of about 125 Gigawatts (GW) of renewable energy capacity in the country by 2030.

Total Investments:

- Expectation of over 8 lakh crores in total investments.

Job Creation:

- Creation of over 6 lakh jobs by 2030.

Reduction in Fossil Fuel Import:

- Saving over 1 lakh crore in fossil fuel imports.

Greenhouse Gas Emissions Reduction:

- Reduction in **about 50 MMT of annual greenhouse gas emissions by 2030**.

Components of the Mission:

SIGHT (Strategic Interventions for Green Hydrogen Transition Programme):

Financial incentives for:

- Domestic manufacturing of electrolysers.

- Production of green hydrogen.

Strategic Hydrogen Innovation Partnership (SHIP):

- Public-private partnership framework for research and development (R&D).

Green Hydrogen Hubs:

- Identification and development of **regions capable of supporting large-scale hydrogen production and utilization.**

Policy Framework:

- Development of an enabling policy framework to support the establishment of the green hydrogen ecosystem.

Standards and Regulations:

- Framework for developing standards and regulations.

Skill Development Programme:

- Coordinated skill development programme.

Pilot Projects:

- Support for pilot projects in emerging end-use sectors and production pathways.

India's Current Status for Green Hydrogen:

Initiatives:

- Commissioning of **India's first 99% pure green hydrogen plant by Oil India Limited in Jorhat, Assam.**

- India's first Green Hydrogen Blending operation in the **Piped Natural Gas (PNG) Network by NTPC in Kawas, Surat.**

- Approval for **5% blending of green hydrogen with PNG** (to be scaled to 20%) by Petroleum and Natural Gas Regulatory Board (PNGRB).

- Collaboration between Pune Municipal Corporation (PMC) and The Green Billions (TGBL) for the **waste-to-hydrogen project.**

Benefits of the Mission:

Export Opportunities:

- Creation of export opportunities for green hydrogen and its derivatives.

Decarbonization:

- Decarbonization of industrial, mobility, and energy sectors.

Reduced Dependence on Imported Fossil Fuels:

- Reduction in dependence on imported fossil fuels and feedstock.

Indigenous Manufacturing:

- Development of indigenous manufacturing capabilities.

Employment Opportunities:

- Creation of employment opportunities.

Technological Development:

- Development of cutting-edge technologies.

- The National Green Hydrogen Mission represents India's commitment to **sustainable energy, innovation, and economic growth** while addressing the challenges of climate change and energy security. It aims to **leverage green hydrogen as a key driver for a cleaner, greener, and more self-reliant energy future.**

Blue Hydrogen

Production Method:

- Natural gas is split into hydrogen and carbon dioxide (CO_2) through processes like Steam Methane Reforming (SMR) or Auto Thermal Reforming (ATR).

- The CO_2 produced is captured and stored, preventing its release into the atmosphere.

Environmental Impact:

- Mitigates the environmental impact by capturing and storing CO_2.

Carbon Capture Method:

- Carbon Capture Usage and Storage (CCUS) technology is used to capture and store the CO_2.

Green Hydrogen

Production Method:

- Hydrogen is produced by splitting water (H_2O) through electrolysis.

- This process only yields hydrogen and oxygen.

Power Source:

- The electrolysis process is powered by renewable energy sources such as wind or solar power.

Environmental Impact:

- Cleanest option as it produces hydrogen from renewable energy sources without any CO_2 by-product.

Grey Hydrogen

Production Method:

- Similar to blue hydrogen, natural gas is used in SMR or ATR to produce hydrogen.

- However, unlike blue hydrogen, the CO_2 produced is not captured and is released into the atmosphere.

Environmental Impact:

- Leads to emissions of CO_2, contributing to greenhouse gas levels.

Pink Hydrogen

Production Method:

- Produced through electrolysis, similar to green hydrogen.

- The difference is that pink hydrogen is powered by nuclear energy.

Power Source:

- Nuclear energy is used to supply the electricity needed for electrolysis.

Environmental Impact:

- Produces hydrogen without direct CO_2 emissions from the electrolysis process.

Yellow Hydrogen

Production Method:

- Also produced through electrolysis like green and pink hydrogen.

- In this case, the electrolysis process is powered solely by solar energy.

Power Source:

- Exclusively uses solar power for the electricity needed for electrolysis.

Environmental Impact:

- Similar to green hydrogen, it **produces hydrogen without direct CO_2 emissions from the electrolysis process.**

Topic 18. UNION HEALTH MINISTRY LAUNCHES NATIONAL ACTION PLAN FOR PREVENTION AND CONTROL OF SNAKEBITE ENVENOMING IN INDIA

Important for the subject: Science and technology

- The Union Health Secretary launched a National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE) in India.

- An array of IEC materials including a booklet on Snakebite, Posters on **"Dos" and "Don'ts"** for the general community and a 7-minute video on Snakebite Awareness also launched.

- **Snakebite Helpline,** a vital resource that will provide immediate assistance, guidance, and support to individuals and communities affected by snakebite incidents will be piloted in five States **(Puducherry, Madhya Pradesh, Assam, Andhra Pradesh and Delhi).**

- **National One Health Programme for Prevention and Control of Zoonoses** onboarded on the Integrated Health Initiative Platform to strengthen surveillance of zoonotic diseases in the country.

About The National Action Plan for Snakebite Envenoming (NAPSE):

- **Vision:** "To prevent and control snakebite envenoming in order to halve the numbers of deaths and cases of disability that it causes by 2030".

- **Mission:** To progressively **reduce the morbidity, mortality and its associated complications** in humans due to Snake bite.

- **The National Action Plan for Snakebite Envenoming (NAPSE)** provides a broad framework for management, prevention and control of Snake bite envenoming in India.

- The activities of human health component are already being implemented under snakebite prevention and control through the State and District Nodal Officer (SNO & DNO) under National Health Mission.

- Surveillance is a key element in NAPSE so that problems can be easily identified, and actions could be undertaken in a timely manner.

About Snakebite Envenoming:

- **Snakebite envenoming is a potentially life-threatening** disease following the bite of a venomous snake.

- In India, **around 50,000 deaths** occur of an estimated 3-4 million snake bites annually which accounts for half of all snakebite deaths globally.

- As per the **Central Bureau of Health Investigation (CBHI) reports (2016-2020),** the average annual frequency of snakebite cases in India is around 3 lakhs and about 2000 deaths occur due to snakebite envenoming.

- In India, around 90% of snake bites are caused by the 'big four' among the crawlers – common krait, Indian cobra, Russell's viper and saw scaled viper.

- Administration of polyvalent anti-snake venom (ASV) containing antibodies against cobra, Russell's viper, common krait and saw scaled viper is effective in 80% of the snakebite cases, however, lack of trained human resources and health facilities to treat snakebite patients remains a cause of concern.

Topic 19. GOVT. ISSUES MARKETING CODE FOR PHARMACEUTICAL FIRMS

Important for the subject: Science and technology

The **Department of Pharmaceuticals** introduced the **Uniform Code for Pharmaceutical Marketing Practices (UCPMP), 2024**, establishing specific guidelines for **pharmaceutical marketing** and **interactions with healthcare professionals**.

Key Guidelines:

- The terms **"safe"** and **"new"** for **drugs must be used cautiously.**

- **"Safe"** should not imply **no side effects, toxic hazards,** or **risk of addiction without qualification. "New" cannot be used for drugs available or promoted in India for over a year.**

- **Medical representatives** are **prohibited from using inducements** or **subterfuge** for interviews with healthcare professionals and **cannot pay for access under any guise.**

- **Continuing Medical Education (CME)** engagements must follow a transparent, verifiable set of guidelines, prohibiting the conduct of such events in foreign locations.

- **Cash, monetary grants,** and **any form of pecuniary advantage** or **benefits to healthcare professionals** or **their family members** by companies or their agents (distributors, wholesalers, retailers, etc.) are **strictly prohibited.**

- **Gifting by pharmaceutical companies** or their agents is **banned.**

- The **UCPMP mandates strict compliance** and will be widely circulated.

- **Drug promotion** must align with the **marketing approval terms,** prohibiting promotion prior to marketing approval receipt.

- Claims about a drug's usefulness must be based on up-to-date evidence evaluation.

Need for the guidelines:

- This organized approach to pharmaceutical marketing practices **aims** to **ensure ethical interactions between the industry and healthcare professionals** while safeguarding the **accuracy and integrity of drug promotion**.

Topic 20. HOW IS NUCLEAR WASTE GENERATED?

Important for the subject: Science and technology

Recently, **India** loaded the **core** of its **Prototype Fast Breeder Reactor (PFBR)** vessel, bringing the country to the cusp of **stage II** — powered by **uranium** and **plutonium** — of its **three-stage nuclear programme.**

What is nuclear waste?

- **Nuclear waste** refers to the **radioactive byproducts** resulting from the **fission process in nuclear reactors,** where **neutrons bombard nuclei of specific elements** like **uranium-235,** causing them to **split** and **release energy** along with **new elements** that **cannot undergo further fission.**

- These **non-fissionable elements,** such as **barium-144** and **krypton-89,** along with **spent fuel** that contains **radioactive fission products** and elements produced through neutron absorption and radioactive decay, constitute **nuclear waste**.

- This waste is **highly radioactive** and **necessitates containment** in specially designed-facilities to **prevent leakage and environmental contamination**.

How do we handle nuclear waste?

- Handling nuclear waste primarily involves **managing spent fuel,** which is both hot and radioactive. Initially, this **spent fuel** is **stored underwater for cooling,** potentially for decades.

- Post-cooling, it is **transferred to dry casks for long-term storage**. Countries with significant **nuclear power programs,** such as **the U.S., Canada,** and **Russia,** have **accumulated large quantities of spent fuel,** necessitating **storage solutions** that ensure **isolation from human contact** for periods extending far beyond the history of modern humans.

- Additionally, **nuclear power plants process liquid waste,** which can involve **discharging treated water with short-lived radionuclides** into the environment, as seen with Japan's treatment and discharge from the **Fukushima plant** into the **Pacific Ocean.**

- Depending on the hazard level, other **liquid wastes** are managed through **evaporation, chemical precipitation, absorption on solid matrices,** or **incineration**.

- For **high-level liquid waste** containing most **fission products from the fuel, vitrification** is employed to **transform it into a stable glass** form for storage.

- In India, due to the **reprocessing of spent fuel to extract uranium and plutonium for use as fuel,** the remaining **fission products** present in the **liquid waste** pose additional accident hazards and require secure storage.

How is nuclear waste dealt with?

Nuclear waste is managed through several methods:

- **Dry-Cask Storage:** After cooling in a **spent fuel** pool for a **minimum of a year,** spent fuel is moved to **dry-cask storage**.

- It's placed inside large steel cylinders, surrounded by inert gas, sealed, and then housed in steel or concrete chambers for safety.

- **Geological Disposal:** As proposed by some experts, this method involves sealing the waste in special containers and burying it underground in stable geological formations like granite or clay.

- This method aims for long-term isolation from human activities, though there's a concern about potential exposure from disturbances such as digging.

- **Reprocessing:** This technology **separates fissile material** (usable in further nuclear reactions) **from non-fissile material in spent fuel through chemical processes. Reprocessing aims to increase fuel efficiency and reduce waste,** but it requires extensive protection due to the hazardous nature of the materials handled.

- A significant issue with reprocessing is that it produces weapons-usable plutonium, necessitating strict international regulations.

How does India handle nuclear waste?

- In **India,** nuclear waste is managed through **facilities in Trombay, Tarapur,** and **Kalpakkam,** with each serving specific functions ranging from producing plutonium for reactors and weapons to processing spent fuel from various reactor types.

- According to a **2015 report**, the **management of low and intermediate-level waste** is conducted **onsite at nuclear power stations,** with **comprehensive monitoring for radioactivity** around these areas.

- Challenges have been noted regarding the **efficiency and capacity factors of reprocessing facilities,** as well as potential complications from the **varied waste** produced by different reactor types, such as the **PFBR (Prototype Fast Breeder Reactor)**.

Issues associated with nuclear waste encompass environmental, operational, and financial challenges:

- **Environmental Concerns:** Historical instances, like the **Asse II salt mine** in **Germany,** illustrate the **risk of nuclear waste contaminating water resources,** including groundwater.

- This case underscores the **environmental hazards** and the extensive efforts and costs required for decontamination, estimated between **€5 billion** and **€10 billion** over about **30 years**.

- **Operational Risks:** The **Waste Isolation Pilot Plant (WIPP)** in the **U.S.** demonstrated the potential for **"unknown unknowns"** when an **accident in 2014 released radioactive materials into the environment,** despite the facility being operational since **1999** with a license for millennia-long storage. This incident revealed significant maintenance failures.

- **Uncertainties in Waste Treatment:** Questions remain regarding the **effectiveness of vitrification plants** at **reprocessing facilities** and the **amount of high-level and intermediate-level liquid waste yet to be vitrified,** indicating uncertainties in managing liquid waste.

- **Siting and Ethical Issues:** Efforts to locate **repositories for nuclear waste** have frequently failed across different countries, raising concerns about environmental injustice and the ethical dilemma of exporting nuclear waste.

- The principle that those benefiting from nuclear power should also bear its disposal costs is a significant ethical consideration.

- **Financial Implications: Managing nuclear waste imposes considerable costs** on the nuclear power sector.

- An analysis of a hypothetical **1,000 MWe nuclear power plant** operating at a **70% capacity factor for 30 years** revealed that **waste management costs account for a significant portion of total expenses**.

- The **front-end cycle, operation waste management,** and **decommissioning,** along with the **back-end fuel cycle,** contribute to the overall costs, imposing an estimated **$1.6-7.1 per MWh of nuclear energy generated**.

Topic 21. MUSK TO 'OPEN SOURCE' HIS GROK CHATBOT TO TACKLE RIVAL CHATGPT

Important for the subject: Science and technology

Elon Musk said he would make his **Grok chatbot,** a rival to ChatGPT, **open source** as his feud with OpenAI deepens.

About Grok chatbot:

- **Grok** is a **generative artificial intelligence chatbot** developed by **xAI,** based on a **large language model (LLM)**.

- The chatbot is advertised as **"having a sense of humor"** and direct access to Twitter (X).

What are large language models (LLMs)?

- **Large Language Models (LLMs)** are **advanced AI systems** designed to understand and **generate human-like language.**

- They use vast amounts of data to learn patterns and relationships in language, enabling them to answer questions, create text, translate languages, and perform various language tasks.

'Open source' chatbots:

- An **open-source chatbot** is **software** that has its **original code available to everyone.**

- Users can tweak this code depending on their needs and preferences.

- One can find these source codes on websites like GitHub and use them to build one's chatbots.

Topic 22. ONE MISSILE, MANY WEAPONS: WHAT MAKES THE LATEST AGNI-5 SPECIAL?

Important for the subject: Science and technology

India has successfully tested an Agni-5 missile equipped with **MIRV technology**, joining a small group of countries with this capability.

- Vice-President lauds the success of Mission Divyastra, the first flight test of indigenously developed Agni-5 missile.

- The Agni-5 missile is capable of carrying multiple warheads and striking multiple targets.

- The most important thing about this new missile is its integration with what is known as the **MIRV technology.** An **MIRV**-equipped missile **has never been used so far** in any conflict situation.

- Arms control advocates argue that **MIRV technology** incentivises the urge to strike first, thus increasing the risk from nuclear weapons.

What is Mission Divyastra?

- The successful launch of **Mission Divyastra** by Prime Minister Narendra Modi is an important milestone in India's nuclear capability.

- This is the first flight test of indigenously developed **5,000-km range Agni-5 nuclear missile, equipped with the Multiple Independently Targetable Reentry Vehicle (MIRV) technology.**

What is MIRV technology?

- **MIRV (Multiple Independently Targetable Re-entry Vehicle) technology** is the capability that allows multiple warheads to be loaded on a single missile delivery system and programmed to hit different targets, thus greatly enhancing the missile's destructive potential.

- The development of **MIRV capability marks a significant upgrade for India's missile systems, and expands its nuclear options.**

- Traditional missiles carry a **single warhead, or weapon, that goes and hits the intended target.**

- **MIRV-equipped missiles can accommodate multiple warheads, each of which can be** programmed to strike a separate target.

- They can all be made to hit the same location too, one after the other, thus ensuring complete annihilation of the target.

Origin of MIRV technology:

- The technology is not new.

- It was developed in the 1960s and first deployed in the 1970s by the United States and the then Soviet Union.

- The warheads have to be miniaturized, be equipped with independent guidance and navigation controls, and **released sequentially from the delivery system.**

- Over the years, **France, the United Kingdom, and China have developed this technology.**

- Pakistan too has claimed to have tested an MIRV-equipped missile called Ababeel, first in 2017 and then in 2023.

Advantages oF MIRV technology

- Apart from the obvious advantage of inflicting multiple damages with a single strike, MIRV is a sought-after military technology for several other reasons.

- It has the ability **to penetrate missile defense systems.**

- A missile defense system is a network of technologies aimed at detecting, tracking, intercepting and **destroying an incoming missile.**

- It involves the deployment of sophisticated radars, communication systems, and interceptor missiles.

- It's considered a good **safeguard against traditional missiles, and several countries are in the process of developing or strengthening their missile defense systems.**

- MIRV-equipped missiles, however, can render the system useless.

- Multiple warheads, each with an independent trajectory, can make the job of tracking and **intercepting extremely complicated.**

- MIRV-equipped missiles can be made to carry decoy warheads to confuse the defense system.

- The response strike could be disproportionate, and can thus serve as a deterrence to the enemy.

Agni upgrade

- The integration of **MIRV technology is a long-awaited upgrade for the Agni family of short,** medium and intercontinental range ballistic missiles indigenously developed by the DRDO.

- Agni missiles are the main land-based delivery systems for India's nuclear weapons. Developed in the 1990s, **the first-generation Agni missiles were deployed in the armed forces in the mid-2000s.**

- **Agni-1 to Agni-IV missiles have ranges between 700 to 3, 500 km** and can carry single payloads weighing between 12 and 40 kilotons.

- Agni-5, the version that has been equipped with MIRV technology, can travel **more than 5,000 km**, and can potentially enter the intercontinental range as well, considered to be 5,500 km and above.

- Its previous flight happened in December 2022, when its night-time capabilities were tested, among other things.

- DRDO has also been developing Agni-P missiles, which are modernized versions of the short-range Agni-1 and Agni-2 variety.

Topic 23. OLDEST 'DEAD GALAXY' YET IS SPOTTED BY JAMES WEBB TELESCOPE

Important for the subject: Science and technology

A significant discovery by **JWST** includes **observations of a galaxy** that had **ceased star formation when the universe was merely 5% of its current age**.

Key Findings about the 'dead galaxy':

- Scientists announced that **JWST** had observed a **galaxy** that became **'dead'** approximately **13.1 billion years ago**, around **700 million years post-Big Bang.**

- This marks it as the **earliest dead galaxy** found by about **500 million years**.

- The study suggests the **galaxy underwent a brief star formation burst** lasting **30** to **90 million years** before stopping. The reasons for this cessation are currently under investigation.

- **JWST's** advanced capabilities allow it to **observe greater distances**—and thus **further back in time**—than the **Hubble Space Telescope**.

- This has led to the discovery of the **earliest-known galaxies,** revealing them to be larger and more numerous than previously expected.

Galaxy Characteristics:

- This galaxy experienced a **short, intense period of star formation** before halting abruptly. With an estimated population of **100 million to one billion stars,** the galaxy is considered **relatively small**.

- After the **halt in star formation,** galaxies evolve into what can be likened to **stellar graveyards**. As **stars die without replacement**, the **galaxy's colour transitions** from **blue** (indicative of hot, massive stars) to **yellow,** then **red** (indicative of less massive stars). The most massive stars, which live the shortest lives, die first in a hierarchical fashion based on stellar weight.

Significance of the discovery:

- The discovery is particularly intriguing given the **active** and **violent state of the early universe,** which had **abundant gas to fuel star formation in galaxies**. The abrupt cessation of star formation in such a galaxy poses a significant puzzle.

- This discovery underscores **JWST's pivotal role in advancing our understanding of the universe's early days,** revealing phenomena that challenge current cosmological models and theories.

Topic 24. A (VERY) BASIC GUIDE TO ARTIFICIAL INTELLIGENCE

Important for the subject: Science and technology

'Artificial intelligence' (AI) is **intelligence in a machine**. There is currently **no one definition of AI.** A simple place to begin is with **AI's materiality**, as a **machine-software combination**.

What does the machine do?

- **Linear separability** is a **fundamental concept** in **AI,** illustrating how machines can **distinguish** between **different categories of data**.

- This concept is exemplified through the task of separating cat and dog images, a process that, while not typically assigned to linear classifiers, serves to clarify the principle involved.

- Through this process, the machine attempts to find a pattern or a line (in the case of a 2D graph) or a plane (in a 3D space) that effectively separates the images into two groups, one predominantly consisting of cat images and the other of dog images.

- Once a satisfactory separation is achieved, demonstrating that the machine has successfully classified the images based on the given features, the experiment concludes.

- This scenario underscores the **machine's ability to distinguish between categories using linear separability,** a **core concept in AI and machine learning,** which involves finding a **linear boundary** that **divides data into distinct groups** based on their features.

How hard is decision-making?

- **Decision-making in AI** ranges from **simple** to **extremely complex,** based on the **dataset's nature** and the **decision's context.**

- **Simple Decision-Making:** In straightforward cases, such as separating a set of marbles based on a single characteristic, decision-making can be very reliable with just one parameter.

- **Intermediate Complexity:** For tasks like distinguishing between cats and dogs, AI may require a dozen parameters.

- These parameters could include various physical attributes, and AI tools might plot these features on graphs to classify the Important for the subjects effectively.

- **High Complexity:** Decision-making becomes significantly more complex in scenarios like a **driverless car deciding when to brake for a bird crossing its path.**

- Here, hundreds of parameters might be needed, including the context of the situation (e.g., the urgency of reaching a destination).

- **Mind-Boggling Complexity: Large Language Models (LLMs)** like **ChatGPT** represent an even more **advanced level of decision-making.**

- **ChatGPT doesn't classify information but generates text by predicting the next word in a sequence based on its training from a massive corpus of text.**

- This process involves understanding the creation process behind the text, reflecting the real world.

- **ChatGPT** operates with over **100 billion parameters,** showcasing its **high level of complexity** in **decision-making** and **text generation**.

Types of Machine Learning:

- **Supervised Learning:** Involves learning from labeled data, where the structure and categories of the data are defined.

- **Unsupervised Learning:** The machine learns to organize and interpret data without predefined labels or categories, identifying patterns and structures on its own.

- **Reinforcement Learning:** The machine learns through trial and error, adjusting its actions based on feedback to maximize a reward signal.

Artificial Neural Networks (ANNs):

- ANNs are computational models inspired by the human brain's network of neurons. They consist of nodes (or neurons) connected in a way that allows the network to learn and make decisions.

Components:

- **Activation Functions:** Algorithms that determine a node's output based on its input signals.

- **Weights:** Values that represent the importance of each input to the node, influencing the output.

Transformers:

- A type of ANN that allows for parallel training, making it efficient for processing large datasets.

Components:

- **Encoder:** Breaks down input data (e.g., an image) into smaller pieces and encodes it as numerical data.

- **Decoder:** Processes the encoded data to reconstruct or interpret the input data's content.

- **Significance:** Introduced in 2017 by Google, transformers have significantly improved the performance of ANNs in tasks like language translation by focusing attention on different parts of the input data.

GPUs and AI Development:

- A **Graphics Processing Unit** initially designed for rendering graphics in video games, is now widely used in running **ANNs** due to its ability to perform parallel computing tasks efficiently.

- **Nvidia's Role:** Nvidia has become a leading provider of GPUs for AI and machine learning, experiencing rapid growth in valuation due to the demand for AI technologies.

Market Challenges:

- Competition from companies developing non-GPU hardware.

- Researchers creating smaller, less resource-intensive learning models.

- Development of new software to reduce dependency on specific hardware, like Nvidia's GPUs.

Topic 25. FAO PUBLISHES FIRST NATIONAL REPORT ON AMR SURVEILLANCE IN INDIA'S FISHERIES, LIVESTOCK SECTORS

Important for the subject: Science and technology

Report: Indian Network for Fishery and Animal Antimicrobial Resistance (INFAAR) Report 2019-22.

- **Published by:** The report is a collaborative effort by the **Food and Agriculture Organization (FAO),** and the **Indian Council of Agricultural Research (ICAR),** with support from the **United States Agency for International Development (USAID)**.

Details:

- It marks the **first antimicrobial resistance (AMR) surveillance** trends report in **India's fisheries and livestock sectors.**

- **INFAAR,** encompassing **20 laboratories, aims** to inform policy and decision-making for AMR containment through data on AMR trends

Multidrug Resistance (MDR) in Aquaculture and Livestock Sectors:

- **Escherichia coli** is a **gram-negative, facultative anaerobic, rod-shaped, coliform bacterium** of the genus **Escherichia** that is **commonly found** in the **lower intestine of warm-blooded organisms**.

- Most **E. coli strains** are **harmless,** but some **serotypes** such as **EPEC**, and **ETEC** are **pathogenic**.

- **E. coli Isolates: 39%** of **aquaculture-origin E. coli isolates** showed **multidrug resistance (MDR),** meaning resistance to three or more classes of antimicrobials.

- In **food-animal samples,** a significant pattern of **MDR** was observed, particularly against **cefotaxime-enrofloxacin** and **tetracycline,** with **12.6%** of isolates showing resistance.

- Notably, **15.8%** of poultry isolates displayed simultaneous resistance to these antimicrobials.

- **Extended Spectrum β-lactamase (ESBL)and AmpC β-lactamase Producers:** The study identified **370 isolates** of **ESBL-producing E. coli** and **292 isolates of AmpC type β-lactamase producers,** both associated with **MDR**.

Key Findings in the Fisheries Sector:

- **Surveillance covered three aquaculture systems: freshwater, brackish water,** and **marine.** Over **3,087 farms** across **42 districts** in **12 Indian states** were surveyed.

- A total of **6,789 bacterial isolates** (including species like **Staphylococcus aureus, E. coli,** and others) were analyzed.

- **Staphylococcus aureus** is a **Gram-positive spherically shaped bacterium,** a member of the **Bacillota,** and is a usual member of the microbiota of the body, **frequently found** in the **upper respiratory tract** and on the **skin.**

- **Methicillin-resistant S aureus (MRSA)** is a drug-resistant variant of **Staphylococcus. High resistance** was observed against **antibiotics** such as **penicillin** and **erythromycin** across different systems.

- Specific resistance patterns were noted for **Aeromonas species** in **freshwater systems** and **Vibrio species** in **saltwater environments.**

Key Findings in the Livestock Sector:

- Surveillance included **major food-producing animals** like **cattle, buffalo, goats, sheep, pigs,** and **poultry.**

- Out of **5,983 samples, 2,076 E. coli** and **1,244 Staphylococcus** isolates were characterized. Notable resistance was observed against cefotaxime and **ampicillin** in **E. coli isolates.**

- Approximately **75%** of both **S. aureus** and **coagulase-negative Staphylococcus (CONS)** isolates exhibited penicillin resistance.

- **Poultry-origin isolates** displayed higher resistance rates compared to other food animals for all tested antibiotics.

Implications and Concerns:

- The report underscores the **critical issue of AMR** in both the **fisheries** and **livestock sectors** in **India.**

- The data highlight the urgent need for informed policy and measures to contain **AMR spread,** crucial for both human and animal health.

- Specific attention is needed to address the **high resistance rates** observed, particularly in pathogens that pose significant health risks to humans.

- This comprehensive surveillance data serves as a **foundation for future research, policy formulation,** and **targeted interventions to combat antimicrobial resistance** in **India's crucial agricultural sectors**.

Topic 26. CHINA, IRAN AND RUSSIA STAGE JOINT NAVAL DRILLS IN THE GULF OF OMAN

Important for the subject: International Relations

The **navies of China, Iran,** and **Russia** have initiated their **fifth joint military drills** in the **Gulf of Oman** amid escalating regional tensions, including **Israel's conflict with Gaza** and **Houthi rebel attacks** on **Red Sea shipping.**

"Maritime Security Belt – 2024":

- These exercises are aimed at **protecting maritime economic activities,** with a focus on **regional maritime security, combatting piracy,** and **maritime terrorism.**

- Participating vessels include **Russia's Varyag cruiser** and **Marshal Shaposhnikov frigate,** and **China's guided-missile destroyer Urumqi, guided-missile frigate Linyi,** and **comprehensive supply ship Dongpinghu**.

- **Azerbaijan, India, Kazakhstan, Oman, Pakistan** and **South Africa** are observer countries.

- Concurrently, a **US-led naval coalition** is addressing **Houthi assaults** in the **Red Sea,** while **NATO** conducts extensive drills in **Northern Europe,** showcasing its defence capabilities, particularly against Russia.

Places in the news:

- **Gulf of Oman:** The **Gulf of Oman** or **Sea of Oman,** also known as **Gulf of Makran** or **Sea of Makran**, is a **gulf** that **connects** the **Arabian Sea** with the **Strait of Hormuz**, which then runs to the **Persian Gulf.**

- It borders **Iran** and **Pakistan** on the **north, Oman** on the **south**, and the **United Arab Emirates** on the **west**.

- **Red Sea:** The Red Sea is a **sea inlet** of the **Indian Ocean,** lying between **Africa** and Its connection to the ocean is in the **south,** through the **Bab-el-Mandeb Strait** and the **Gulf of Aden.**

- To its **north** lie the **Sinai Peninsula, the Gulf of Aqaba,** and **the Gulf of Suez** (leading to the Suez Canal). It is underlain by the **Red Sea Rift,** which is part of the **Great Rift Valley**.

- Countries sharing a border with the Red Sea are **Saudi Arabia, Sudan, Egypt, Eritrea, Yemen.**

What makes snakebite a neglected tropical disease (NTD):

- There are four primary criteria that define an illness as a **neglected tropical disease (NTD), and snakebite envenoming satisfies each of them:**

- First, there is a **significant burden of mortality and morbidity** (as detailed in the answer to question 1) – snakebite envenoming is a high-impact disease.

- Secondly, **a majority of incidents of snakebite occur in the world's tropical and subtropical regions**, and it particularly impacts the poor – snakebite is a tropical disease.

- Thirdly, **snakebite is amenable to treatment, as well as prevention** – the impact of snakebite can be mitigated now if we make the effort to do so.

- Finally, **the overall level of investment in research addressing snakebite,** from prevention to diagnosis to treatment and rehabilitation, is exceptionally low in comparison to its impact – snakebite is a neglected disease.

Topic 27. THE ITALIAN COURT RULING AGAINST RETURNING SEA MIGRANTS TO LIBYA

Important for the subject: International Relations

Italy's top court acknowledged that migrants face the risk of 'inhuman and degrading treatment' at detention centers should they be returned to Libyan coastguards.

- Rights agencies have **drawn attention to human rights abuses** in Libyan territory, particularly in coastal prisons run by coastguards and armed militias, which become grounds for vast human trafficking networks.

- **Unprotected refugees and asylum seekers** are reportedly facing violence, torture, and inhumane conditions.

- **Groups like UpRights and StraLi welcomed the "landmark" ruling**, urging Italy to comply with international human rights standards and end its complicity with violations of migrants' rights.

The court cases

- The case in **question is a 2018 incident.**

- A lower **Italian court prosecuted the ship's captain in 2021,** finding him guilty of violating international humanitarian and refugee laws.

- The principle of **non-refoulement forbids the forced return of people to countries where their lives or rights are at risk.**

- As per international law, **Libya is currently not a port of safety.**

- The court said that once picked up, the migrants were under the captain's charge, and in 'abandoning' them, the captain violated directives of the **International Maritime Organization and the International Convention for the Safety of Life at Sea (SOLAS).**

What are the legal obligations in handling rescues at sea?

- The expanse of the **Mediterranean Sea between Libya and Italy** is among the most dangerous albeit oft-used passage for migrants from sub-Saharan Africa fleeing ethnic conflict, war and famine.

About Article 98 of the United Nations Convention on the Law of the Sea:

- **Under Article 98 of the United Nations Convention on the Law of the Sea**, every shipmaster is required "to render assistance to any person found at sea in danger of being lost."

- International maritime law also requires coastal states to conduct search and rescue services, and if needed, coordinate with other nations during these operations.

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 i**s the capital of **Libya.**

- **Libya** had the largest proven crude oil reserves in **Africa.**

Topic 28. TOPIC NO. 26 – INDIA'S RANKINGS IN HUMAN DEVELOPMENT AND GENDER INEQUALITY

Important for the subject: International relations

Human Development Index (HDI):

2022 Ranking: India ranked 134 out of 193 countries.

- HDI Value: 0.644

- **2021 Ranking**: India ranked 135 out of 191 countries.

- HDI Value: 0.633

- **Trend:** India's HDI value increased to 0.644 in 2022, **showing an improvement compared to 2021**. This places **India in the medium human development category.**

Progress:

- **Life Expectancy:** Increased from 67.2 to 67.7 years.

- **Expected Years of Schooling:** Reached 12.6 years.

- **Mean Years of Schooling:** Increased to 6.57 years.

- **Gross National Income (GNI) per Capita:** Increased from $6,542 to $6,951.

Overall Change (1990-2022):

HDI Value Increase: 48.4%

- From 0.434 in 1990 to 0.644 in 2022.

Gender Inequality Index (GII):

- **2022 Ranking**: India ranked 108 out of 193 countries.

- **GII Score:** 0.437

- **2021 Ranking**: India ranked 122 out of 191 countries.

- **GII Score:** 0.490

- **Improvement:** India showed significant progress in reducing gender inequality, **jumping 14 ranks in the GII-2022 compared to GII-2021.**

Gender Gaps:

- Labour Force Participation: **8% difference between women (28.3%) and men (76.1%).**

Key Points:

Human Development Progress:

- India has **demonstrated improvements** in all HDI indicators, **including life expectancy, education, and GNI per capita.**

- The country's GNI per capita has seen substantial growth, **increasing by approximately 287% since 1990.**

- Life expectancy, **expected years of schooling, and mean years of schooling have also shown positive trends.**

Gender Inequality Reduction:

- **India's GII value of 0.437 is better than** the global and South Asian averages.

- The country has made strides in **reducing gender inequality,** as reflected in its improved GII ranking.

- However, there remains a significant gender gap in the labour force participation rate.

Medium Human Development Category:

- With an HDI value of 0.644, **India remains in the medium human development**

- The country's progress in various HDI indicators reflects a positive trend in overall development.

Global and Regional Context:

- The report emphasizes that **while some countries have seen record human development, half of the poorest nations remain below their pre-crisis levels of progress.**

- India's progress, **especially in reducing gender inequality**, is notable compared to global and South Asian averages.

- India's rankings in the HDI and GII highlight both progress and areas for further improvement in human development and gender equality.

Human Development Report (HDR)

- The **Human Development Report (HDR) is an annual publication released by the United Nations Development Programme (UNDP) since 1990**.

- The HDI is a composite index that measures the average achievements in human development across countries. It considers four key indicators:

- **Life Expectancy at Birth:** This indicator reflects the **average number of years a newborn is expected to live**, providing insights into the overall health and well-being of a population.

- **Expected Years of Schooling:** This indicator estimates the **number of years of education a child entering school is expected to receive**, providing insights into educational opportunities.

- **Mean Years of Schooling:** This indicator measures the average number of years of education received by **adults aged 25 years and older**, offering insights into the overall educational attainment of a population.

- **Gross National Income (GNI) per Capita:** This indicator reflects the average income of a country's citizens, **adjusted for purchasing power parity (PPP).** It provides insights into the economic well-being and standard of living.

- By combining these indicators into a single index, **the HDI offers a comprehensive snapshot of a country's overall level of human development. Countries are ranked based on their HDI scores, allowing for comparisons and assessments of progress over time.**

- **Theme in 2021-2022: "Uncertain Times, Unsettled Lives: Shaping our Future in a World in Transformation" –** The Human Development Report 2021-22 focuses on the theme of uncertainty and change in a rapidly evolving world.

- It **explores the impacts of global trends such as technological advancements, climate change, demographic shifts, and the COVID-19 pandemic** on human development.

- **Theme in 2023 – UNDP Report "Breaking the Gridlock":** The data was published in the **United Nations Development Programme's report titled "Breaking the Gridlock:**

- **Reimagining Cooperation in a Polarized World".** This report builds on the 2021–2022 Human Development Report findings, **highlighting global trends and challenges in human development.**

About Gender Inequality Index (GII)

- The Gender Inequality Index (GII) is a composite measure **developed by the United Nations Development Programme (UNDP) to assess gender disparities in various aspects of life within countries**.

- It provides a comprehensive overview of **gender gaps in health, empowerment, and economic opportunities.**

- The GII aims to highlight areas **where women face relative disadvantages compared to men and where progress is needed to achieve gender equality**.

Components of the Gender Inequality Index:

- **Reproductive Health:** This dimension measures **maternal mortality rates and adolescent birth rates**. High maternal mortality rates and early adolescent pregnancies are indicators of limited access to reproductive health services and education.

- **Empowerment:** The empowerment dimension includes two indicators:

- **Proportion of parliamentary seats held by women**: This reflects the representation of women in national parliaments, indicating their political participation and influence.

- **Proportion of women aged 25 years and older with at least some secondary education**: Education plays a crucial role in empowering women and expanding their opportunities.

- **Labor Market Participation:** This dimension considers the **labor force participation rate for women aged 15 and older compared to men**. A significant gap in labor force participation indicates disparities in economic opportunities and access to employment.

Interpretation of the Gender Inequality Index:

- The GII is expressed as a value between 0 and 1, with higher **values indicating greater gender inequality within a country**.

- A GII value close to **0 indicates lower gender inequality,** where women and men have more equal opportunities and outcomes.

- A GII value closer to **1 indicates higher gender inequality**, where women face greater disparities compared to men in various aspects of life.

Topic 29. EU WILL OPEN SEA CORRIDOR TO SEND AID FROM CYPRUS TO GAZA AMID FAMINE FEARS

Important for the subject: International Relations

The **EU** has announced the **imminent opening of a sea corridor** from **Cyprus to Gaza, aiming** to **prevent a famine** that has already begun to claim lives.

Amalthea Initiative:

- Started under the leadership of **Cyprus.**

- **Aim:** To establish a mechanism for **securely shipping aid** from **Cyprus to Gaza** via **sea.**

- The **international backing for this corridor** includes a **coalition of countries** and **aims to tackle the complex logistics of delivering aid directly to Gaza by sea.**

- This **corridor** is seen as a vital step in delivering **humanitarian aid directly to Gaza,** about **210 nautical miles away** from **Cyprus.**

- The **initiative**'s launch is marked by a pilot delivery conducted by the **Spanish** search and rescue group **Open Arms,** with food supplied by **World Central Kitchen.**

- While the **EU** has detailed the **shipments' direct route to Gaza,** specifics on landing points, unloading, and food distribution remain unclear.

The U.S. initiative:

- This initiative appears separate from a **US plan** announced by President Joe Biden to **construct a floating dock near Gaza for aid delivery,** a plan that has faced criticism from aid workers for its feasibility and timeline.

- Amidst this effort, the **UK** has urged **Israel** to **allow more trucks into Gaza**.

- This initiative comes as the **humanitarian situation in Gaza worsens,** with **30,000 Palestinians** reported **dead** since the start of the war, and parts of **Gaza,** especially the north, facing **famine conditions.**

Cyprus:

- It is an **island country** located in the **eastern Mediterranean Sea, north** of the **Sinai Peninsula, south** of the **Anatolian Peninsula,** and **west** of the **Levant.**

- It is **geographically** a part of **West Asia,** but its **cultural ties** and **geopolitics** are overwhelmingly **Southeast European.**

- **Cyprus** is the **third-largest** and **third-most populous island** in the **Mediterranean.** It is located **east of Greece, north of Egypt, south of Turkey,** and **west of Lebanon and Syria.**

- Its capital and largest city is **Nicosia**. The northeast portion of the island is de facto governed by the self-declared **Turkish Republic of Northern Cyprus**.

- **Israel- Hamas conflict through map:**

Hamas strike on Israel   **Israel's strike on Hamas and Gaza**

Topic 30. BURKINA FASO YOUTH JOIN FIGHT TO END FEMALE GENITAL MUTILATION

Important for the subject: International Relations

Youngsters in Burkina Faso are joining the state in the fight against female genital mutilation (FGM) as population displacement caused by jihadist violence threatens significant progress made over the last decade. Cases of FGM have been recorded in areas to where people affected by the violence have fled.

- Since 2015, almost 20,000 people have died in the unrest and more than two million been displaced in the Sahel nation of 23 million inhabitants, the majority of whom are women

What is Female genital mutilation (FGM)?

- Female genital mutilation (FGM) comprises all procedures that involve partial or total removal of the external female genitalia, or other injury to the female genital organs for non-medical reasons.

- The practice has no health benefits for girls and women and cause severe bleeding and problems urinating, and later cysts, infections, as well as complications in childbirth and increased risk of newborn deaths.

Burkina Faso

- **It is a landlocked country in West Africa, is known for its rich cultural heritage, diverse landscapes, and struggles with poverty and political instability.**

Bordering countries

- Mali to the northwest

- Niger to the northeast

- Benin to the southeast

- Togo and Ghana to the south

- Ivory Coast to the southwest

Topic 31. CALL FOR REVIEW OF TRIPS AGREEMENT: INDIA'S JOINT STATEMENT AT WTO

Important for the subject: International Relations

Under 13th Ministerial Conference of the World Trade Organization (WTO) in Abu Dhabi, where the **temporary waiver of certain intellectual property rights (TRIPS) for Covid-19 related therapeutics and diagnostics was not extended**, India, along with Bangladesh, Colombia, and Egypt, has jointly called for a review of the TRIPS Agreement.

Objective of the Joint Call:

- The joint statement calls for a review of the TRIPS Agreement with a focus on the **development dimension, technology transfer, and other concerns of developing countries.**

- This review is intended to build on the lessons learned during the Covid-19 pandemic.

Key Points of the Submission:

First Review under Article 71:

- The joint submission calls upon the Council for TRIPS to undertake its first review under **Article 71 on the implementation of the TRIPS Agreement**.

Examination of TRIPS and CBD Relationship:

- India and other nations are pursuing the fast-tracking of the examination of the relationship between the **TRIPS Agreement and the Convention on Biological Diversity (CBD).**

- The goal is to align the TRIPS Agreement with the CBD and create rules **that prevent bio-piracy and protect traditional knowledge.**

Background on TRIPS Agreement:

- The TRIPS Agreement, effective since January 1, 1995, **sets out the minimum standards of intellectual rights protection required by each WTO Member.**

- It provides guidelines for the **protection of various forms of intellectual property, including patents.**

Continuation of Work after MC13:

- **While the TRIPS waiver on vaccines was not extended to therapeutics and diagnostics at the WTO MC13**, the joint declaration emphasizes the need to continue work in relevant WTO bodies.

- The goal is to **review and build on the lessons learned and challenges experienced during the Covid-19 pandemic.**

- This effort aims to **develop effective solutions for future pandemics** in an expedited manner.

Conclusion:

- India and its partner countries are advocating for a comprehensive review of the TRIPS Agreement to address the development concerns of developing nations, **ensure fair access to medicines and technology, and protect traditional knowledge**.

- The joint call reflects the ongoing efforts to align international trade rules with global health priorities and the needs of all member countries.

Key Outcomes of WTO's 13th Ministerial Conference (MC13):

Accessions:

- Endorsed the **accession of Comoros and Timor-Leste**, bringing WTO membership to 166 countries.

Reform of Deliberative and Negotiating Functions:

- Ministers welcomed efforts to **improve WTO Councils, Committees, and Negotiating Groups for efficiency and effectiveness.**

Dispute Settlement System:

- Renewed commitment to **achieving a fully functional dispute settlement system accessible to all Members by 2024.**

E-Commerce:

- Extended the e-commerce moratorium until MC14 or March 31, 2026.

TRIPS Non-Violation and Situation Complaints:

- Extended the **moratorium on "non-violation" and "situation" complaints** under the TRIPS Agreement.

COVID-19 Related TRIPS Waiver:

- Took note of the lack of consensus on expanding **special rules for compulsory licenses to COVID-19 diagnostics and therapeutics**.

Special and Differential Treatment:

- Adopted a decision to **improve the use of S&D provisions**, especially in technical barriers to trade and sanitary measures.

Sustainability Initiatives:

- Worked on initiatives such as **Dialogue on Plastics Pollution and Fossil Fuel Subsidy Reform.**

Fisheries Subsidies:

- Welcomed progress towards the **Agreement on Fisheries Subsidies (AFS) entry** into force, with 71 Members ratifying the agreement.

Conclusion:

- The WTO faces significant challenges in maintaining its relevance and effectiveness in the global trading system.

- **Key outcomes of MC13, such as agreements on e-commerce, fisheries subsidies, and sustainability initiatives, highlight progress amid complex trade dynamics.**

- **India's concerns, particularly in agriculture, market access, and IPR,** reflect the diverse issues member countries navigate.

- Necessary reforms, **including dispute settlement revitalization, rule updates, and S&D enhancements, are crucial for the WTO to address current trade challenges and promote inclusive, sustainable global trade**.

- As the world economy evolves, the WTO must adapt to remain a central pillar of international trade governance.

- **Compulsory Licensing (CL)** is a legal mechanism that allows **governments to grant licenses to third parties to produce, use, or sell a patented product or process without the consent of the patent holder**.

- This is typically done to address certain public interest concerns, **such as ensuring access to essential medicines, promoting competition, or addressing market failures.**

Topic 32. WARRING TRIBES IN PAPUA NEW GUINEA SIGN CEASEFIRE DEAL

Important for the subject: International Relations

A temporary ceasefire was negotiated in **Papua New Guinea** to address ongoing revenge killings in the country's remote highlands.

Background:

- The **central Enga province** has experienced years of tit-for-tat fighting, with a significant escalation in recent months.

- The ceasefire involves **two main factions,** the **Yopo Alliance** and the **Palinau Alliance,** which met in the capital, **Port Moresby**, to finalize a three-month ceasefire agreement.

- The agreement mandates both factions to lay down arms and halt all forms of hostility.

Historical Context:

- Clashes between highland clans in **Papua New Guinea** have a centuries-old history. However, the recent violence has been exacerbated by the introduction of mercenaries and automatic weapons, intensifying the cycle of violence.

Papua New Guinea:

- **Papua New Guinea** is a country in **Oceania** that comprises the **eastern half of the island of New Guinea** and its offshore islands in **Melanesia** (a region of the southwestern Pacific Ocean north of Australia).

- Officially the **Independent State of Papua New Guinea**, it shares its **only land border** with **Indonesia** to the **west** and it is directly adjacent to **Australia** to the **south** and the **Solomon Islands** to the **east.**

- Its capital, located along its southeastern coast, is **Port Moresby**.

- The country is the **world's third largest island country,** with an area of 462,840 km2 (178,700 sq mi).

Enga Province:

- **Enga** is one of the provinces in **Papua New Guinea (PNG)**.

- **Enga** is geographically situated in the **northern region** of **Papua New Guinea** and was separated from the adjacent Western Highlands at the time of national independence in **1975.**

- The majority ethnic group are **Engans.**

Topic 33. HUMANITARIAN CRISIS IN HAITI AS THE CARIBBEAN'S MOST POPULOUS COUNTRY MAY HAVE FALLEN TO ARMED GANGS

Important for the subject: International Relations

Haiti, the **Western Hemisphere's poorest country** and the **Caribbean's most populous nation** may have been **overtaken by criminal gangs,** leading to the **evacuation of US embassy staff** from **Port-au-Prince** by the **United States Marine Corps**, as reported by the Miami Herald.

- Haitians can't lead a decent life, and live in fear, and the capital is essentially under siege by armed groups.

- **UN High Commissioner for Human Rights** warned that the world was 'running out of time' to act on **Haiti's crisis**.

- **Armed gangs**, growing **stronger** since the **2010 earthquake**, launched an offensive on February 29 to **overthrow Prime Minister Ariel Henry's government,** targeting hospitals, prisons, and transportation hubs.

A country in turmoil- Haiti:

- **Haiti** shares the **island of Hispaniola** in the **Caribbean Sea** with the **Dominican Republic.**

- Named **Ayiti** by its **Taino natives, Haiti** was the **site of Columbus's first settlement in the Americas, La Navidad,** founded in **1492.**

- Formerly a **French colony** known as **Saint-Domingue,Haiti** became **Latin America** and the **Caribbean's first independent country,** the **world's first free black republic,** and the **second republic in the Western Hemisphere** after **the US**, following the **Haitian Revolution (1791-1804)** led by **Toussaint Louverture.**

- **Post-independence, Haiti** was **forced to pay France 150 million francs** as **"reparations to French slaveholders,"** a debt cleared over **122 years.**

- The **20th century** saw a **19-year US occupation** and political interference, including support for the **Duvalier Dynasty** and the **ousting of Haiti's first democratically elected president, Jean-Bertrand Aristide**.

- Since the devastating **2010 earthquake, Haiti** has struggled with **political instability** and **leadership issues**, with successive leaders using armed gangs as private militias, which have now become powerful and uncontrollable.

- In **2021, President Jovenel Moïse** was **assassinated,** and his successor, **Ariel Henry,** faced threats of overthrow.

- The ongoing unrest has led to the **internal displacement of 362,000 Haitians,** over half of whom are **children**, with more than **160,000 people displaced** in the **Port-au-Prince** metropolitan area alone, as reported by the **International Organization for Migration**.

Topic 34. YAOUNDE DECLARATION: HEALTH MINISTERS OF 11 AFRICAN COUNTRIES COMMIT TO END MALARIA DEATHS

Important for the subject: International Relations

In a historic meeting in **Yaoundé, Cameroon, African health ministers** and **key malaria stakeholders** committed to **ending malaria deaths,** acknowledging the **urgent need given the availability of tools and systems.**

Yaounde Declaration:

- **Malaria** cases **globally rose** from **233 million** in **2019** to **249 million** in **2022,** with **Africa** experiencing an **increase** from **218 million** to **233 million cases,** highlighting its status as the **epicentre of the malaria crisis**.

- The **11 participating African countries (Burkina Faso, Cameroon, Democratic Republic of the Congo, Ghana, Mali, Mozambique, Niger, Nigeria, Sudan, Uganda, and Tanzania**) account for over **70%** of the **global malaria burden**.

- The **Yaoundé Declaration** reflects an **"unwavering commitment"** to fight **malaria,** including a **pledge by African heads of state** to **allocate 15% of their annual budgets** to health sector strengthening.

- **Key focuses** include **addressing root causes of malaria stagnation,** enhancing **health infrastructure** and **personnel capacity,** fostering **multi-sectoral collaboration,** and holding countries accountable for their commitments.

- Despite the declaration's lack of new commitments and specific targets, it marks a significant milestone in the **fight against malaria**.

- The **African Unionaims to control and eliminate malaria by 2030**, but progress has **fallen short of interim goals**, with significant financial gaps hindering efforts.

- The continent requires **$1.5 billion** to **sustain basic malaria services** and an additional **$5.2 billion annually** for progress towards elimination, plus **$11 billion annually** for **climate adaptation** in the **health sector.**

About Malaria:

- Caused by the **Plasmodium parasite.**

- The parasite is **spread to humans through the bites of infected mosquitoes**. People who have malaria usually feel very sick with a high fever and shaking chills.

- Once the parasites enter the human body, they travel to the **liver** — where some types can lie dormant for as long as a year.

- When the **parasites mature**, they **leave the liver** and **infect your red blood cells**. This is when people typically develop malaria symptoms.

Disease-causing Microbes:

- **5 Plasmodium parasite** species cause malaria in humans.

- **falciparum** and **P. vivax** pose the **greatest threat.**

- **falciparum** – deadliest malarial parasite and the most prevalent on the **African continent.** 95% of all cases of **P. falciparum** occur in the **African region** and are associated with severe disease and disease-associated mortality.

- **P. vivax** – geographically most widespread in **tropical and subtropical regions**. Dominant in most countries outside of sub-Saharan Africa

- **Other 3 Plasmodium species** infecting humans – **P. malariae, P. ovale** and **P. knowlesi.**

Topic 35. INDIA-EFTA TRADE AND ECONOMIC PARTNERSHIP AGREEMENT

Important for the subject: International Relations

Duties Phased Out:

Duties on a substantial number of goods imported from **EFTA countries (Switzerland, Norway, Iceland, and Liechtenstein)** will be phased out by India under the agreement.

Offered Tariff Lines:

- India is offering 82.7% of its tariff lines, covering 95.3% of EFTA exports. **More than 80% of this import is gold.**

Sensitivity Consideration:

- Sensitivity related to **Production-Linked Incentives (PLI) in sectors such as pharmaceuticals, medical devices, and processed food have been considered** while extending offers.

Exclusion List:

- Sectors such as dairy, soya, coal, and sensitive agricultural products are kept on the exclusion list.

Immediate Elimination of Tariffs:

- Coal (except steam and coking coal), most medicines, dyes, most textiles and apparel, and iron and steel products will have **zero tariffs immediately** upon the entry into force of the FTA.

Gradual Elimination of Tariffs:

- Tariffs on various products will be **eliminated over different time frames**:

- Cod liver oil and fish body oil: Five years

- Tuna, trout, salmon, olive oil, cocoa bean, powder, malt products, corn flakes, instant tea, roasted chicory, most machinery, bicycle parts, clocks, and watches: Seven years

- Smartphones, chocolates, medical equipment (most), chocolate, caramel, coffee, avocado, apricot, and olives: Ten years

Exclusive Duty Cut Offers:

- **Some duty-cut offers are exclusive to Switzerland** due to its status as the largest trade partner among the EFTA countries.

Duty Cuts on Wines:

- Duty cuts on **wines from Switzerland will align mostly with concessions extended to Australia** under the **Australia-India Economic Cooperation and Trade Agreement**.

Tariff Cuts in Sugar and Diamonds:

- India commits to a **50% tariff reduction in sugar over ten years and a 50% tariff reduction for cut and polished diamonds to 2.5%** in five years.

Industrial Products:

- 98% of India's exports to Switzerland (**accounting for 70% of India's exports to EFTA) are industrial products, which will now be imported duty-free.**

Agricultural Exclusions:

- Switzerland has excluded **most agricultural items such as dairy products, honey, various vegetables, wheat, maize flour, and cane sugar from these concessions**.

Conclusion:

- The India-EFTA Trade and Economic Partnership Agreement aims to **gradually eliminate tariffs on a wide range of goods traded between India and EFTA countries.**

- This move is expected to boost trade relations, create new market opportunities, and **promote economic cooperation between the parties involved.**

Highlights of the TEPA:

Scope of the Agreement:

- The TEPA covers a wide range of areas **including tariff reductions, increased market access, and streamlined customs procedures.**

- It includes a chapter on commitments to **human rights and sustainable development, a first for an FTA involving EFTA countries.**

Goal of $100 Billion Investment:

- Commerce Minister stating that it **includes a "binding commitment" for EFTA countries to invest $100 billion in India.**

- However, EFTA ministers clarified that this **commitment is a "goal" based on current investment levels, GDP projections, and the estimated value of the TEPA.**

Investment Promotion:

- The **TEPA's Chapter 7** focuses on "**Investment Promotion and Cooperation**," outlining shared objectives to **increase foreign direct investment (FDI) from EFTA states into India.**

- Aims include $50 billion increase in FDI within 10 years and another $50 billion in the subsequent five years.

- Additionally, the **agreement targets the generation of 1 million jobs in India resulting from these investments.**

Negotiation and Ratification:

Extensive Negotiations:

- Talks for the India-EFTA FTA began in 2008, with a significant break before resuming in 2023.

- The 14-chapter treaty was concluded after 21 rounds of negotiations, **covering crucial areas such as investment, rules of origin, intellectual property rights (IPR), and sustainable development.**

Expected Ratification:

- The agreement will come into force after ratification by EFTA states through their parliamentary procedures, expected possibly by the end of the year.

Significance and Implications:

Export Boost:

- India anticipates a significant increase in exports to EFTA countries, **especially in sectors such as textiles, leather, gems, and jewelry.**

- Reduction of tariff disadvantages will enhance **India's competitiveness in the EFTA market.**

Cheaper Raw Materials:

- Indian industries will benefit from access to cheaper raw materials from **EFTA countries, particularly in sectors like steel, aluminum, and engineering.**

Strengthening Indo-Pacific:

- The TEPA contributes to a **stronger Indo-Pacific economic architecture, fostering cooperation and capacity-building among nations**.

Controversies and Concerns:

Pharma Clause Dispute:

- The inclusion of a "**data exclusivity" clause** for pharmaceuticals was a point of contention.

- Indian negotiators rejected this clause, citing concerns over access to generic medicines and patient rights.

IPR Review Mechanism:

- The TEPA includes a review mechanism for **intellectual property rights, which some activists fear could pressure India into adopting stricter measures.**

Assessment and Monitoring:

- Continuous monitoring through the **Joint EFTA-India Committee will ensure progress towards investment and job creation goals.**

- India retains the option to withdraw trade concessions temporarily if targets are not met within the stipulated timeframe.

What is Data Exclusivity?

- **Data exclusivity is a provision within trade agreements that imposes a specific period during which the clinical trial data for a drug developed by a pharmaceutical company is protected from use by competitors.**

- This protection means that generic drug manufacturers cannot rely on the original clinical trial data to support their own applications for market approval during this exclusivity period.

Key Features:

- **Duration**: The duration of data exclusivity can vary but typically ranges from 5 to 10 years.

- **Purpose**: It is intended to reward innovation by providing a period of market exclusivity to the originator company, during which they can recoup their investment in research and development without competition from generic versions of the drug.

- **Impact**: Data exclusivity can delay the entry of generic versions of drugs into the market, which may limit competition and keep prices higher for consumers.

Impact on India's Generic Drug Industry:

- **Affordability of Medicines**: India's generic drug industry is renowned for providing affordable medications, not only to its own population but also to many countries around the world. Data exclusivity could hinder the availability of these cost-effective alternatives.

- **Competition and Innovation**: By delaying the entry of generic versions, **data exclusivity may reduce competition in the pharmaceutical market.** This could potentially stifle innovation and limit patients' access to newer treatments.

Topic 36. INDIA 'ONE OF THE WORST AUTOCRATISERS': V-DEM REPORT ON DEMOCRACY

Important for the subject: International Relations

Democracy Report 2024:

The **Sweden (Gothenburg)**-based **V-Dem Institute** released the **'Democracy Report 2024'.**

- The **Democracy Report 2024** is based on contributions from **4,200 scholars worldwide** and utilizes **31 million datasets** covering **202 countries** from **1789** to **2023.**

- This summary underscores the concerning trend of **democratic backsliding in India and globally,** highlighting the critical role of upcoming elections and governance in shaping the future of democracy.

Key findings:

- **The V-Dem Institutecategorizes nations into four types:Liberal Democracy, Electoral Democracy, Electoral Autocracy,** and **Closed Autocracy.**

- As of **2023,71%** of the **world's population** (5.7 billion people) live under **autocratic regimes**, a significant **increase** from **48% a decade ago.**

- **Democratisation** is occurring in **only 18 countries,** affecting **5%** of the global population.

- The report notes **deterioration in almost all democratic components,** with **freedom of expression, clean elections,** and **freedom of association/civil society** being the most affected.

- **Electoral management bodies' autonomy** is **weakening** in **more than half of the autocratising countries.**

- The report highlights a **global trend** towards **autocratisation,** with **42 countries** (35% of the global population) moving towards **less democratic governance.**

- **India** represents about **half of this demographic,** making it a significant contributor to the trend.

Specific Observations on India:

- **India** has been downgraded from an **"electoral autocracy"** since **2018** to ``**one of the worst autocracies".**

- **India's** level of **"liberal democracy"** has **regressed** to levels last seen in **1975,** during **Indira Gandhi's emergency declaration.**

- The current government, led by the BJP, has been critiqued for **undermining freedom of expression, media independence**, and **civil liberties.**

- Laws related to **sedition, defamation,** and **counterterrorism** have been used to suppress dissent.

- There's a noted suppression of **religious freedom, intimidation of political opponents,** and **silencing of dissent in academia.**

- **Bhutan** is highlighted as the **only liberal democracy** in **South** and **Central Asia.**

- The report specifically mentions that **a third term for the BJP and Mr Modi in India could lead to further autocratisation.**

Topic 37. WHAT IT WILL TAKE TO HAVE SIMULTANEOUS ELECTIONS IN INDIA

Important for the subject: Polity

The High Level Committee on One Nation, One Election headed by former **President Ram Nath Kovind** has recommended that elections to Lok Sabha and state Assemblies should be held at the same time.

- The committee recommended that the **elections to local bodies (municipalities and panchayats) too should be "synchronized"** so that they are held within 100 days of the simultaneous state and national elections.

- To give effect to its r**ecommendation, the committee has suggested 15 amendments to the Constitution of India** in the form of both new provisions and changes to existing provisions to be carried out through **two Constitution Amendment Bills.**

About two Constitution Amendment Bills.:

- The **first Bill will deal with the transition to a simultaneous election system,** and the **procedure for fresh elections to Lok Sabha or a state Assembly** before the expiration of their stipulated five-year term.

- According to the **Kovind committee, this Bill can be passed by Parliament without the requirement for consultation** with state governments or ratification by state Assemblies.

- The **second Bill will deal with municipal and panchayat elections**, as well as the creation of a Single Electoral Roll by the **Election Commission of India (ECI),** with details of every voter and the seat for which they are eligible to vote.

- The **Kovind committee has acknowledged that this Bill** deals with Important for the subjects on which states have the primary power to enact laws — and it would, therefore, require the **approval or ratification** of more than half of India's states before it can be enacted

Transition to simultaneous polls; Parliament's power to make laws

- The first Bill recommended by the Kovind committee would begin by inserting a **new article— 82A —into the Constitution.**

- **Article 82A** will establish the process by which the country will move to a system of simultaneous elections for Lok Sabha and state Assemblies.

- **Article 82A(1)** will state that **"on the date of the first sitting of the House of the People after a general election"**

- **Article 82A(2)** will state that **"all the Legislative Assemblies constituted in any general election held after the appointed date** shall come to an end on the expiry of the full term of the House of the People".

- The proposed **Article 82A(3)** requires the ECI to hold **"General elections to the House of the People and the Legislative Assemblies simultaneously".**

- **Article 82A(4):** If the ECI believes that elections to any legislative assembly cannot be conducted simultaneously, **"it may make a recommendation to the President, to declare by an Order, that the election to that Legislative Assembly may be conducted at a later date".**

- **Article 82A(5) states** "the full term of the Legislative Assembly shall end on the same date as the end of the full term of the House of the People constituted in the General Election".

- The proposed Bill also **recommends amending Article 327, which gives Parliament the power to make laws relating to elections to Lok Sabha, Rajya Sabha, and state legislatures, i**ncluding the preparation of electoral rolls and delimitation of constituencies.

- The Kovind committee has **recommended that the power of Parliament under Article 327 should be expanded to include "conduct of simultaneous elections" as well.**

- **When Lok Sabha or state Assembly is dissolved before 'full term' ends**. Lok Sabha and state Assemblies are constituted for a period of five years after each election.

- The committee has recommended that this **five-year period be referred to as "the full term" by amending Sub-clause 2 of Article 83 ("Duration of Houses of Parliament") and Sub-clause 1 of Article 172 ("Duration of the State Legislatures").**

- If Lok Sabha or a state Assembly is dissolved before the expiry of the full term, **the remaining period will be referred to as the "unexpired term".**

- The recommended **Articles 83(4) and 172(4) state that the Lok Sabha or state Assembly** that replaces the previous one will serve only for the remaining **"unexpired term"** before being dissolved again once simultaneous elections are conducted as scheduled.

- These amendments are also a part of the **first Constitution Amendment Bill** proposed by the Kovind committee, which it says will not require ratification by states.

Amendment of certain laws relating to legislative Assemblies in Union Territories:

- The report has also recommended the amendment of certain laws relating to legislative Assemblies in Union Territories such as **The Government of National Capital Territory of Delhi Act, 1991, The Government of Union Territories Act, 1963, and the Jammu and Kashmir Reorganisation Act, 2019.**

The amendment does not require States ratification:

- The **elections to the House of the People and the State Legislative Assemblies are held by the Election Commission of India under the Constitution of India, The Representation of People Act, 1950, The Representation of People Act, 1951**, and the rules and orders made thereunder.

- The amendments required for simultaneous elections to the House of the People and the State Legislative Assemblies do not fall under the purview of the **provisions to Article 368(2) and hence, do not warrant a ratification by the States.**

About Article 328:

- The Kovind panel has stated that states under **Article 328 of the Constitution** only have residual powers on conducting Assembly elections; the power is mainly entrusted to **Parliament through Article 327.**

- The article deals with **Power of Legislature of a State to make provision** with respect to elections to such Legislature

Simultaneous local body elections, preparation of single electoral roll

- The **second Constitution Amendment Bill recommended by the Kovind committee** contains amendments that would require ratification by the states.

- Under **Article 368(2), any constitutional amendment that deals with Important for the subjects in the State List (where states have the power to enact laws)** would have to be ratified by at least half of the state legislatures in the country before it can be passed.

- Amendments suggested in the **second Bill relate to municipal and panchayat elections, which fall under Entry 5 of the State List titled "Local government"** and would require ratification by the states. The committee has **suggested the inclusion of a new Article 324A in the Constitution**.

- This new article would empower Parliament to make laws to ensure that municipality and panchayat elections are held simultaneously with the **General Elections (to Lok Sabha and state Assemblies).**

- The **Kovind committee has also recommended that new sub-clauses should be added to Article 325 of the Constitution.**

- The **new Article 325(2) proposed by the committee will create a "Single Electoral Roll for every territorial constituency for election in the House of the People, Legislature of a State or to a Municipality or a Panchayat".**

- This electoral roll "shall be made by the Election Commission in consultation with the State Election Commissions"

Amendment to the Constitution:

- **Article 368 of the Constitution** deals with the power and procedure to **amend the Constitution.**

- **While several provisions can be amended by a simple majority** like in passing any ordinary legislation, **a special majority of not less than two-thirds of the members** present and voting is required for other provisions.

- **For a third category of "entrenched provisions" that impact the federal structure of the Constitution** or the powers of the state Assemblies, an amendment requires to be ratified by legislatures of at least half of the states.

- **Article 368(2) (d) lists the representation of states in Parliament** as one of the issues that would require ratification.

Topic 38. PRESIDENT APPOINTS FORMER IAS OFFICERS GYANESH KUMAR, SUKHBIR SINGH SANDHU AS NEW ELECTION COMMISSIONERS

Important for the subject: Polity

President Droupadi Murmu appointed **retired IAS officers Gyanesh Kumar** and **Sukhbir Singh Sandhu** as **new Election Commissioners,** based on the **recommendations** of a **selection panel** led by **Prime Minister Narendra Modi**.

- These appointments filled vacancies left by the retirement of **Anup Chandra Pandey** and the resignation of **Arun Goel**.

- **Gyanesh Kumar** is set to become the **Chief Election Commissioner** in **February 2025**.

- **Gyanesh Kumar**, a 1988 Kerala cadre IAS officer, has previously worked with Union Home Minister Amit Shah and retired as the Secretary of the Ministry of Cooperation.

- **Sukhbir Singh Sandhu,** from the 1998 Uttarakhand cadre, has served as Uttarakhand's Chief Secretary under Chief Minister Pushkar Singh Dhami.

- The **selection process** involved a **search committee** led by the **Union Law Minister** and a **final selection panel** including the **Prime Minister, the Leader of the Opposition in Lok Sabha,** and a **Union Minister.**

Election Commission of India (ECI)

- The Election Commission of India is an autonomous constitutional authority responsible for administering Union and State election processes in India.

- The body administers elections to the Lok Sabha, Rajya Sabha, State Legislative Assemblies in India, and the offices of the President and Vice President in the country.

- Election Commission of India is a permanent Constitutional Body. The Election Commission was established in accordance with the Constitution on 25th January 1950. The Commission celebrated its Golden Jubilee in 2001.

- Originally the commission had only a Chief Election Commissioner. It currently consists of Chief Election Commissioner and two Election Commissioners.

- For the first time two additional Commissioners were appointed on 16th October 1989 but they had a very short tenure till 1st January 1990.

- Later, on 1st October 1993 two additional Election Commissioners were appointed. The concept of multi-member Commission has been in operation since then, with decision making power by majority vote.

Topic 39. TWO KEY RTI PORTALS UNDER 'EMERGENCY MAINTENANCE'

Important for the subject: Polity

The **Union government's RTI Online portal,** crucial for submitting **Right to Information applications,** has been **temporarily unavailable** due to **"emergency maintenance"** this week, complicating access to previously filed applications.

- Concurrently, the **Election Commission's separate RTI portal fixed a security flaw** that **risked exposing users' personal information**.

- The flaw's resolution involved coordination with the **Indian Computer Emergency Response Team (CERT-in)**.

- Additionally, the portal experienced difficulties with its **payment gateway**, now resolved but with **limitations on payment methods** and the **notable absence of the State Bank of India for Net banking options**.

Error message:

- The **government's RTI Online portal,** managed by the **Department of Personnel and Training (DoPT)** under the **Ministry of Personnel, Public Grievances & Pensions,** has been experiencing functional disruptions.

- The **DoPT claimed the implementation of an archival mechanism to enhance the portal's speed**.

- The **Telangana RTI portal** also experienced downtime due to **"essential training"** for **government officers**.

About the RTI Act:

- The **RTI Act,** enacted in **2005**, empowers Indian citizens to access information from public authorities, fostering transparency, accountability, and participation in governance.

- It **superseded** the **Freedom of Information Act of 2002.**

- Initiatives like the one by **Mazdoor Kisan Shakti Sangathan (MKSS)** in **Rajasthan,** leading to the **state's Right to Information Act in 1997**, paved the way for the **national RTI Act.**

- **Section 22** ensures the Act's provisions prevail over contradictions with the **Official Secrets Act of 1923** or any other existing laws and agreements, except for those not covered by the Act.

Constitutional Backing:

- Derived from **Article 19(1)(a) of the Constitution**, which guarantees freedom of speech and expression.

- Recognised as a **fundamental right under Article 19,** as per the Supreme Court ruling in the **Raj Narain vs. the State of Uttar Pradesh case**.

Time Frame for Providing Information:

- Public authorities must furnish the requested information **within 30 days** of receiving an application.

- For information concerning the life or liberty of a person, it must be provided within **48 hours.**

- An additional **five days** are added if the application is **routed through an Assistant Public Information Officer** or sent to an incorrect public authority.

Exemptions:

- **Section 8(1)** specifies exemptions, including information related to national security, state strategy, foreign relations, and incitement to offenses.

Implementation Mechanisms:

- The **Public Information Office (PIO)** plays a key role in executing the **RTI Act,** acting as a liaison between the requesting citizen and the government entity holding the information.

- Applicants can appeal to the **First Appellate Authority** within the public authority if dissatisfied with the **PIO's response** or if their request is denied.

- A second appeal can be made to the **Central or State Information Commission** if issues remain unresolved after the first appeal.

Recent Amendments in the RTI Act

- **Section 44 (3)** of the **Digital Personal Data Protection Act 2023** amended **Section 8 (1)(j)** of the **RTI Act.**

- This amendment exempts all personal information from disclosure, removing the previously established exceptions that allowed for the release of such information.

Right to Information (Amendment) Act, 2019:

- This amendment revised the tenure and service conditions for the **Chief Information Commissioner (CIC)** and **Information Commissioners (ICs)** at both **central and state levels.**

- The tenure of **ICs** is now **determined by the central government,** set for a period of **3 years**, as opposed to the original fixed term of **5 years**.

- The amendment specifies that the **salary, allowances, and other service conditions** of the **CIC** and **ICs** (both at the **centre** and **states**) will be **prescribed by the central government**.

- The **2019 Act** eliminated provisions that **allowed for the deduction of pension or other retirement benefits** for previous government service at the time of appointing the **CIC** and **ICs**.

Topic 40. MURMU PRESENTS PRESIDENT'S STANDARD AND COLORS TO FOUR IAF UNITS

Important for the subject: Polity
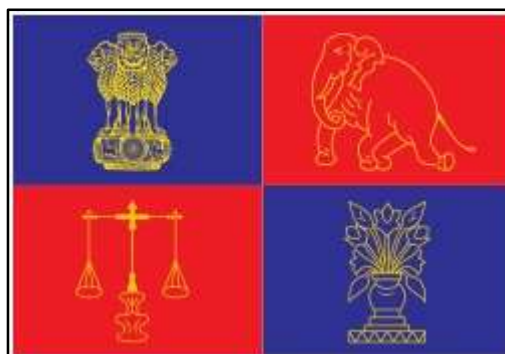
President **Droupadi Murmu on March 8** presented the President's Standard's to two fighter squadrons of IAF and President's Colors to two formations at Hindon Air Force station.

- This is the **first time in the history** of the service that four units have been awarded the President's Standard and Colors together in a single ceremony.

These include:

- **No. 45 'Flying Daggers'**, the first Light Combat Aircraft (LCA) squadron of the IAF and No. **221 Squadron 'Valiants**' which flew almost one-third of all offensive missions of the IAF during the 1999 Kargil conflict will be at **President's Standard.**

- The **11 Base Repair Depot (BRD)** and **509 Signal Unit (SU)** will be awarded **President's Colors.**

- The award of the President's Standard and Colors is the highest honor that can be bestowed upon any military unit.

Presidential standard of India:

- The presidential standard of India was a flag flown by the president of India from 1950 to 1971.

- It succeeded the flag of the governor-general of India (used during the 1947–1950 period of the Dominion of India) on 26 January 1950, when India became a republic.

- It ceased being used on 15 August 1971, when the president began using the national flag of India.

- The standard was a rectangle divided quarterly into blue and red quadrants. Each quadrant was occupied by national symbols drawn in gold outline. The symbols were-

- 1st quarter: The **Lion Capital of Ashoka**, which is the State Emblem of India, to represent unity;

- 2nd quarter: A **lively Indian elephant** from a 5th-century painting of Ajanta Caves, Maharashtra to represent patience and strength;

- 3rd quarter: A **weighing scale f**rom the 17th-century **Red Fort**, Delhi, to represent justice and economy;

- 4th quarter: A vase of **Indian lotus from Sarnath**, Uttar Pradesh to represent prosperity.

President's Colour Award:

- The President's Colour Award is the **highest honor** that can be bestowed upon **any military unit of India.**

- It is also known as **Nishaan**, which is an emblem that is worn by all unit officers on the left-hand sleeve of their uniform.

- While the practice of carrying the Colour into battle has stopped, the tradition of receiving, holding and parading the Colour continues even today in the Armed forces.

- The President's Colors is very significant, if the unit loses their colors, it is a disgrace for that unit and, if the unit captured the enemy's colors then it is a great honor for that unit.

Topic 41. ADVISORY TO AIRLINES BY FSSAI

Important for the subject: Polity

The Food Safety and Standards Authority of India (FSSAI) has issued an **advisory to airlines regarding the proper labeling and compliance with food safety regulations for food served on flights**.

Labeling Requirements:

- **Use by Date and Time**: Airlines must ensure that prepared food served on flights is **properly labeled with essential information, including the "use by date and time."**

- **Caterer's Name**: The packaging of in-flight meals should **prominently display the name of the caterer or manufacturer.**

- **FSSAI License Number**: Passengers should be made aware of the **FSSAI license numbers of both the caterer/manufacturer and the airline.**

- **Packaging Details**: Other essential details such as **the date and time of packaging must be provided on the packaging**, as per the FSS (Labelling and Display) Regulations, 2020.

Compliance with Food Safety Laws:

- **FSSAI Act and Regulations**: Flight kitchen operators and in-flight food-service providers **must comply with the Food Safety and Standards Act, 2006, and its rules and regulations**, including the FSS (Labelling and Display) Regulations, 2020.

- **Licensing Norms**: Airlines are directed to ensure compliance with licensing norms, **especially when selling pre-packaged food products and private-label products**.

- **Grievance Redressal**: Passengers should be informed that **they can lodge food-related grievances on the FSSAI's Food Safety Connect App.**

Surveillance and Inspection:

- **Supply Chain Inspection**: FSSAI has conducted a **surveillance drive to inspect the supply chain** of food served to in-flight passengers.

- **Observations**: Discrepancies were observed in the description of "Kind of Business" in the FSSAI licenses of flight kitchen operators.

- **Food Preparation**: Food is prepared by flight kitchen operators located near airports and **then transported to flights through specialized vehicles like insulated refrigerated vans/wagons.**

Licensing Clarifications:

- **Kind of Business**: Flight kitchen operators are asked to describe themselves as "food services (caterer)" in their FSSAI license applications.

- **Separate License**: Firms transporting food to flights from flight kitchens must obtain a separate FSSAI license.

- **Single License for Airlines**: Airlines can obtain one FSSAI license instead of separate licenses in different states.

- **Pre-Packaged Food**: Airlines selling pre-packaged food should indicate themselves as "retailer" in the license.

- **Manufacturing or Importing**: Airlines getting pre-packaged food products manufactured or imported under their brand name should obtain an appropriate manufacturing or importer license.

- **Storage of Food**: Airlines involved in storing food also need to obtain a separate FSSAI license.

Compliance and Enforcement:

- The FSSAI advisory aims to ensure that **airlines and food service providers comply with food safety regulations, maintain transparency in labeling, and provide passengers with safe and hygienic food during flights.**

- The advisory from FSSAI underscores the **importance of food safety, proper labeling, and compliance with regulations to protect the health and well-being of airline passengers**. Airlines are urged to adhere to these guidelines to maintain high standards of food safety and hygiene.

About Food Safety and Standards Authority of India (FSSAI)

- The Food Safety and Standards Authority of India (FSSAI) is an **autonomous statutory body established under the Food Safety and Standards Act of 2006.**

Establishment and Mandate:

- **Establishment**: FSSAI was established to consolidate various laws related to food safety and standards in India. **The Act of 2006 brought together laws such as the Prevention of Food Adulteration Act, 1954, the Fruit Products Order, 1955, the Meat Food Products Order, 1973, and others.**

- **Central Reference Point**: The Act aimed to establish a single reference point for all matters relating to food safety and standards.

- **Responsibilities**: FSSAI is responsible for **protecting and promoting public health by regulating and supervising food safety and quality in India.**

- It operates under the Ministry of Health & Family Welfare.

Organizational Structure:

- **Headquarters**: FSSAI has its headquarters in **New Delhi.**

- **Regional Offices**: It has regional offices in eight zones across the country to facilitate efficient monitoring and enforcement.

- **Leadership**: The Chairperson and Chief Executive Officer of FSSAI are appointed by the central government. The **Chairperson holds the rank of Secretary to the Government of India**.

Functions and Powers:

- **Regulations and Standards**: FSSAI frames regulations and standards for various food products and additives to ensure safety and quality.

- **Licensing and Registration**: It grants licenses and registrations to food businesses after ensuring compliance with standards.

- **Enforcement**: FSSAI enforces food safety laws and regulations through monitoring, surveillance, and inspections.

- **Risk Assessment**: The authority conducts risk assessment and scientific research on food safety issues to guide its policies.

- **Training and Awareness**: FSSAI provides training and awareness programs on food safety and hygiene to stakeholders.

- **Promotion of Food Fortification**: It promotes initiatives such as food fortification and the consumption of organic food.

- **Coordination**: FSSAI collaborates with other agencies and stakeholders on food safety matters to ensure a holistic approach.

Events and Campaigns:

- **World Food Safety Day**: FSSAI observes and promotes World Food Safety Day to raise awareness about safe and nutritious food.

- **Eat Right India**: This campaign aims to promote healthy eating habits and lifestyle choices.

- **Eat Right Station**: FSSAI's initiative to ensure availability of healthy food options at railway stations.

- **Eat Right Mela**: Events organized to promote awareness about food safety and nutrition.

- **State Food Safety Index**: A tool to measure and rank states based on their food safety performance.

- **RUCO (Repurpose Used Cooking Oil)**: FSSAI's initiative to **collect and convert used cooking oil into biodiesel.**

- **Food Safety Mitra**: A scheme to engage and train individuals as food safety supervisors.

- **100 Food Streets**: A project to **promote safe and hygienic street food vending.**

About Bureau of Indian Standards (BIS):

- **National Standard Body**: BIS is the National Standard Body of India established under the BIS Act 2016.

- **Responsibilities**: It oversees the harmonious development of **standardization, marking, and quality certification of goods.**

- **Consumer Protection**: The BIS Act empowers the government to **authorize agencies beyond BIS for certification and enforcement of standards, enhancing consumer protection.**

- **Headquarters**: BIS has its headquarters in New Delhi.

Agricultural Marketing (AGMARK):

- **Certification Mark**: AGMARK is a **certification mark for agricultural produce**, ensuring conformity to specified grade standards.

- **Mandate**: It assures **quality and differentiates between grades for various** agricultural commodities.

- **Grade Standards**: DMI under the **Ministry of Agriculture & Farmers Welfare** notifies grade standards for agricultural products.

Topic 42. EC QUITS, COMMISSION DOWN TO ONE; PM PANEL TO MEET NEXT WEEK TO FILL VACANCIES

Important for the subject: Polity

Barely days before the 2024 Lok Sabha elections were expected to be **announced, Election Commissioner Arun Goel resigned.**

- **Goel's resignation as Election Commissioner** is only the third instance in the poll watchdog's history.

About Election Commission:

- **The Election Commission of India** is an autonomous constitutional authority responsible for administering Union and State election processes in India.

- The body administers elections to the **Lok Sabha, Rajya Sabha, and State Legislative Assemblies in India,** and the offices of the President and Vice President in the country.

- **Part XV of the Indian constitution** deals with elections, and establishes a commission for these matters.

- **Article 324 to 329 of the constitution** deals with powers, function, tenure, eligibility, etc of the commission and the member

Appointment of Election Commissioners:

- **The CEC and ECs will be appointed by the President** upon the recommendation of a Selection Committee.

- Appointment of the Commission: The **Commission will be appointed by the Preside**nt, upon the recommendation of the **Selection Committee.**

- The Selection Committee will comprise the **Prime Minister, Cabinet Minister, and Leader of Opposition in Lok Sabha (or leader of the single largest opposition party).**

- A Search Committee headed by the **Cabinet Secretary will suggest five names to the Selection Committee.**

- The Selection Committee may consider any person other than those suggested by the Search Committee.

- Recommendations of the Selection Committee will be valid even when there is a vacancy in this Committee.

- Eligibility for the posts includes holding (or having held) a post equivalent to the Secretary to the central government.

- The salary and conditions of service of the CEC and ECs will be equivalent to that of Cabinet Secretary. Under the 1991 Act, it was equivalent to the salary of a Supreme Court Judge.

Term and reappointment:

- **Members of the Election Commission** will hold office for six years, or until they attain the **age of 65 years**, whichever is earlier.

- Members of the **Commission cannot be re-appointed**.

- If an **EC is appointed as a CEC**, the overall period of the term may not be more than six years.

Salary and pension:

- The **salary, allowances,** and other conditions of service of the **CEC and ECs** will be **equivalent** to that of the **Cabinet Secretary.**

- They will have an option to draw pension and other retirement benefits from the service that they belonged to previously.

Removal:

- The **CEC** may be **removed** in the **same manne**r and on the same grounds **as a Supreme Court Judge.**

- **ECs** may be **removed only upon** the **recommendation of the CEC.**

Topic 43. CENTRE ENSURES PLACE FOR MADIGA MEMBER IN SCHEDULED CASTE PANEL

Important for the subject: Polity

The **Union government** has formed the latest **National Commission for Scheduled Castes (NCSC),** focusing on **including members** from **underrepresented communities,** particularly ensuring **at least one member from the Madiga community,** significantly present in **Telangana** and **Andhra Pradesh.**

- The **Ministry of Social Justice** announced the appointments, naming **BJP Gujarat spokesperson Kishor Makwana** as the **NCSC Chairperson.**

- **VadepallyRamchander** from **Telangana** and **Love   Kush   Kumar** from **Uttar Pradesh** have been appointed as **members**.

- **VadepallyRamchander's** inclusion is notable following the government's move to form an internal committee **aimed** at the **sub-categorisation of Scheduled Castes,** addressing a **long-standing demand** from the **Madiga community** for **equitable distribution of benefits and reservation.**

- The acting chairperson was **Arun Halder**.

About the Madiga community:

- The Madiga community is a **Telugu caste** from **southern India,** primarily residing in the states of **Andhra Pradesh, Telangana**, and **Karnataka,** with a **small minority in Tamil Nadu**. Historically, they were associated with **tannery, leatherwork,** and **small handicrafts.** Today, most are **agricultural labourers.**

- The community is **categorized** as a **Scheduled Caste** by the **Government of India.**

Their concern:

- The **Madiga community** has voiced concerns over being **marginalized** in favour of the **Mala community,** despite their **significant numbers within the Scheduled Castes.**

- The government's initiative to explore **sub-categorisation** aims to **ensure fair access to benefits for the most backwards among the SCs,** though the **Supreme Court** has yet to rule on the feasibility of **SC quota sub-categorisation.**

What is the sub-categorization of SC groups?

- **Sub-categorization** involves **classifying existing SC caste groups** into **further categories** based on their **historical dominance** in **availing government benefits meant for SCs.**

- It **aims** to **ensure a more equitable distribution of benefits among SC communities** by giving **higher shares to historically marginalized groups** and **lesser shares to those that have traditionally dominated such benefits**.

NCSC

- NCSC is a **constitutional body** that works to safeguard the interests of the **scheduled castes (SC) in** India.

- **Article 338** of the constitution of India deals with this commission:

- It provides for a **National Commission for the Scheduled Castes and Scheduled Tribes** with duties to investigate and monitor all matters relating to safeguards provided for them, to inquire into specific complaints and to participate and advise on the planning process of their socio-economic development etc.

Its evolution

Special Officer:

- Initially, the constitution provided for the appointment of a Special Officer under Article 338.

- The special officer was designated as the Commissioner for Scheduled Castes and Scheduled Tribes.

65th Amendment, 1990:

- It replaced the one-member system with a multi-member National Commission for Scheduled Castes (SC) and Scheduled Tribes (ST).

- The Constitution (65th Amendment) Act 1990, amended Article 338 of the Constitution.

89th Amendment, 2003:

- By this amendment, the erstwhile National Commission for SC and ST was replaced by two separate Commissions from the year 2004 which were: National Commission for Scheduled Castes (NCSC) and National Commission for Scheduled Tribes (NCST)- under Article 338-A.

Structure –

- Chairperson.

- Vice-chairperson.

- Three other members.

- They are appointed by the President by warrant under his hand and seal.

Functions –

- Monitoring and investigating all issues concerning the safeguards provided for the SCs under the constitution.

- Enquiring into complaints relating to the deprivation of the rights and safeguards of the SCs.

- Taking part in and advising the central or state governments with respect to the planning of socio-economic development of the SCs.

- Regular reporting to the President of the country on the implementation of these safeguards.

- Recommending steps to be taken to further the socio-economic development and other welfare activities of the SCs.

- Any other function with respect to the welfare, protection, development and advancement of the SC community.

Topic 44. PUBLIC HEALTH FOUNDATION OF INDIA SURPASSES HARVARD, BAGS SECOND PLACE IN GLOBAL RANKINGS FOR SCHOOLS OF PUBLIC HEALTH

Important for the subject: Polity

In the first global rankings for schools of public health, the Public Health Foundation of India (PHFI) has secured an impressive second place, surpassing Harvard.

- The leading five institutions in the list include the London School of Hygiene and Tropical Medicine, the Public Health Foundation of India (PHFI), Harvard T.H. Chan School of Public Health, the Swiss School of Public Health (SSPH+) and the Johns Hopkins Bloomberg School of Public Health.

- The rankings are part of a report titled **'A New Model for Ranking Schools of Public Health: The Public Health Academic Ranking(PHAR)'** published in the International Journal of Public Health.

About PHAR:

- The **PHAR is the first international bibliometric university** ranking system designed for academic public health.

- The project was funded by the **Institute of Global Health, University of Geneva**

About Public Health Foundation of India (PHFI):

- The **Public Health Foundation of India (PHFI) is a not for profit public private initiative** working towards a healthier India. It was established on **28 March 2006.**

- **The Public Health Foundation of India (PHFI) is a public private initiative** that has collaboratively evolved through consultations with multiple constituencies including Indian and international academia, state and central governments, multi & bi-lateral agencies and civil society groups.

Topic 45. ON CEC'S SOLITARY VIGIL, SUPREME COURT HAD SAID 'TWO HEADS BETTER THAN ONE'

Important for the subject: Polity

Chief Election Commissioner (CEC) Rajiv Kumar is in sole charge of the Election Commission (EC) with the resignation of Election Commissioner Arun Goel ahead of the Lok Sabha polls' announcement.

- The Supreme Court, in **S.S. Dhanoa versus Union of India**, said one person at the helm of the powerful poll body was against the **"tenets of democratic rule".**

Seshan case verdict:

- The Election Commission can therefore be a single-member body or a multi-member body if the President considers it necessary to appoint one or more Election Commissioners.

- The Constitution Bench was **interpreting clause 2 of Article 324, which said that the Election** Commission shall consist of the Chief Election Commissioner and such number of other Election Commissioners, if any, as the President may from time-to-time fix.

- Our Constitution-makers have provided for a multi-member body.

- The plain language of **Article 324(2) envisages a multi-member Commission**

About Election Commission:

- **The Election Commission of India** is an autonomous constitutional authority responsible for administering Union and State election processes in India.

- The body administers elections to the **Lok Sabha, Rajya Sabha, and State Legislative Assemblies in India**, and the offices of the President and Vice President in the country.

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- Appointment of the Commission: The **Commission will be appointed by the Preside**nt, upon the recommendation of the **Selection Committee.**

- The Selection Committee will comprise the **Prime Minister, Cabinet Minister, and Leader of Opposition in Lok Sabha (or leader of the single largest opposition party).**

- A Search Committee headed by the **Cabinet Secretary will suggest five names to the Selection Committee.**

- The Selection Committee may consider any person other than those suggested by the Search Committee.

Term and reappointment:

- **Members of the Election Commission** will hold office for six years, or until they attain the **age of 65 years**, whichever is earlier. Members of the **Commission cannot be re-appointed**.

- If an **EC is appointed as a CEC**, the overall period of the term may not be more than six years.

Salary and pension:

- The **salary, allowances,** and other conditions of service of the **CEC and ECs** will be **equivalent** to that of the **Cabinet Secretary.**

- They will have an option to draw pension and other retirement benefits from the service that they belonged to previously.

Removal:

- The **CEC** may be **removed** in the **same manne**r and on the same grounds **as a Supreme Court Judge.**

- **ECs** may be **removed only upon** the **recommendation of the CEC.**

Topic 46. SC SEEKS T.N. GOVT.'S RESPONSE TO HC ORDER ON CHILD PORN

Important for the subject: Polity

The Supreme Court has sought a response from the Tamil Nadu government to a petition filed by Just Rights for Children Alliance, an NGO coalition, challenging a Madras High Court order that mere downloading and private viewing of child pornography was not an offense.

- A Bench, headed by **Chief Justice of India D.Y. Chandrachud**, issued a notice to the State on the basis of a plea against the High Court quashing the FIR and criminal proceedings against a 28-year-old man.

- There was a glaring increase in child pornography cases in the country – **from 44 cases in 2018 to 1,171 cases in 2022 – as per National Crime Records Bureau data.**

Madras High Court Verdict:

- The High Court had quashed the judicial proceedings against the man and held that downloading child pornography was not an offense under **Section 67B of the Information Technology (IT) Act**, 2000.

- The High Court had categorically said that watching child pornography per se was not an offense as the accused had merely downloaded it on his electronic gadget and watched it in private.

About Child Pornography:

- Under the **The Protection of Children from Sexual Offences (Amendment) Act, 2019** a person is guilty of using a child for pornographic purposes if he uses a child in any form of media for the purpose of sexual gratification.

- The **Act also penalises persons who use children for pornographic purposes** resulting in sexual assault.

- The Bill defines child pornography as any visual depiction of sexually explicit conduct involving a child including photograph, video, digital or computer generated image indistinguishable from an actual child.

- The **Act penalizes storage of pornographic material for commercial purposes with a punishment of up to three years, or a fine, or both.**

- The Bill amends this to provide that the punishment can be imprisonment between three to five years, or a fine, or both.

- In addition, the Bill adds two other offenses for storage of pornographic material involving children.

These include:

- **(i) failing to destroy, or delete, or report pornographic material involving a child**

- **(ii) transmitting, displaying, distributing such material except for the purpose of reporting it.**

Topic 47. CAA: ISSUES IN THE LEGAL CHALLENGE TO THE LAW

Important for the subject: Polity

More than four years after Parliament passed The Citizenship (Amendment) Act, 2019, the Ministry of Home Affairs on Monday notified the Rules to implement the law.

- The CAA, which had led to widespread protests in the winter of 2019-20, is also under challenge before the Supreme Court.

Timeline of The citizenship law

- In December 2019 Parliament passed an amendment to **The Citizenship Act, 1955,** to include a provision for grant of citizenship to migrants belonging to the **Hindu, Sikh, Buddhist, Jain, Parsi, or Christian communities who entered India before December 31, 2014 from Pakistan, Afghanistan, or Bangladesh.**

- The amendment relaxed the eligibility criteria for certain classes of migrants (on religious lines) **from three neighboring Muslim-majority countries.**

- Certain categories of areas, including tribal areas in **Assam, Meghalaya, Mizoram, and Tripura, and areas protected by the 'Inner Line' system, were exempted from the purview of the CAA.**

- **The colonial concept of Inner Line separates the tribal-majority hills of the Northeast** from the plains areas.

To enter and stay in these areas, an Inner Line Permit (ILP) is needed.

- The law was notified on January 10, 2020 amidst protests around the country, particularly in Assam, but could not be implemented in the absence of the Rules.

- On May 28, 2021, the central government issued an order under **Section 16 The Citizenship Act, 1955,** giving district collectors in 13 districts with high migrant

populations the power to accept citizenship applications from groups identified in the 2019 amendment.

- The **39-page Rules notified in the e-gazette on Monday** prescribe the modalities and procedure for eligible individuals to apply for Indian citizenship.

- The Rules specify what documents and paperwork are required for putting forward and considering a claim of citizenship.

The legal challenge

- The amendment was challenged before the Supreme Court in 2020 by the Indian Union Muslim League (IUML).

- Since then, more than 200 petitions have been filed and tagged with the IUML's challenge.

- In October 2022, a Bench comprising then Chief Justice of India U U Lalit and Justices Ravindra Bhat and Hima Kohli passed an order stating that final hearings would begin in December 2022 after CJI Lalit's retirement.

- The challenge to the CAA rests on the ground that it violates Article 14 of the Constitution, which says that "the State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India".

- The petitioners' argue that using religion as a qualifier or a filter violates the fundamental right to equality.

The CAA and Assam:

- Apart from the equality argument, part of the challenge to the **CAA also rests on the fate of Section 6A of The Citizenship Act, 1955.**

- In December 2023, a five-judge Constitution Bench led by Chief Justice of India D Y Chandrachud reserved its verdict on the validity of Section 6A, which was introduced in the Citizenship Act after the signing of the Assam Accord between the Centre and the leaders of the Assam movement in August 1985.

The Accord determines who is a foreigner in the state of Assam.

- **Clause 5 of the Accord states that January 1, 1966** shall serve as the base cut-off date for the detection and deletion of "foreigners"**, but there are provisions for the regularization of those who arrived in the state after that date, and upto March 24, 1971.**

- **This was also the basis of the final NRC published in 2019. Section 6A of the Act allows foreign migrants who came to Assam after January 1, 1966 but before March 25, 1971, to seek Indian citizenship.**

- If the effective cut off date of March 24, 1971 is upheld by the SC as the cut-off date for entry into the state, the CAA could fall foul of the Assam Accord, since it creates a different timeline.

Topic 48. INDIA'S PROPOSED MARITIME DEVELOPMENT FUND

Important for the subject: Economy

Objective:

- The proposed fund aims to provide **long-term, low-cost financial support** to promote indigenous ship-building in India.

Expected Timeline:

- The fund is likely to be ready by the **end of this year**.

Participation:

- It will involve **participation from industry stakeholders, financial institutions, and Ministries**.

Structural Options:

Two options are under discussion:

- Setting up a **dedicated maritime vertical** under a proposed development finance institution.

- Establishing a **standalone company** with multi-agency equity.

Reducing Ship Leasing Costs:

- India currently spends about **$75 billion annually** on leasing ships from outside.

- The aim is to **boost India's ship-building industry to reduce dependence on leasing**.

India's Current Tonnage and Goals:

- India owns **about 2%** of the world's total tonnage with approximately **1,500 ships** under its flag.

- The fund aims to **increase India's share to up to 5% of the world's tonnage**.

Focus Areas of the Fund:

- The Maritime Development Fund will **focus on the entire value chain, including ship-building, flagging, ownership financing, and leasing.**

- It will also promote **cruise tourism** and activities such as **mechanization** and **capacity expansion** of existing ports **through Public-Private Partnerships (PPPs).**

Proposed Corpus and Funding Mechanisms:

- The fund is proposed to start with a corpus of **₹25,000 crore** over a **seven-year period**.

- It will utilize **multiple funding mechanisms** such as debt, equity, Viability Gap Funding (VGF), and buyer credit support. **Challenges in Accessing Finance:**

- Indian shipping companies face challenges in growing tonnage due to difficulties in accessing required finance.

Seeking 'Infrastructure' Status:

- The Ministry is working with the Finance Ministry to **provide 'infrastructure' status to vessel operators and shipping companies.**

- This status will enable them to **raise long-term, low-cost finance for the shipping sector.**

Government Initiatives:

- The Ministry is taking steps to make the **shipping sector more attractive by providing infrastructure status and facilitating access to long-term funds**.

- The fund will play a crucial role in **boosting India's maritime sector**, enhancing indigenous ship-building capabilities, and reducing leasing costs.

Current Status of Maritime Transport in India:

Global Ranking:

- India is the **16th largest maritime country** in the world.

Trade Volume and Value:

- Maritime transport in India handles **95% of trade by volume** and **68% by value**.

Ship Recycling:

- India is among the **top 5 ship recycling countries**

- Holds **30% share** in the global ship recycling market.

Ship-Breaking Industry:

- India owns over **30% global market share** in the ship-breaking industry.

- The **largest ship-breaking facility** is located in **Alang, Gujarat**.

Sagar Mala Program:

- Launched in **2017** for **port-led development** and growth of logistics-intensive industries.

Port Infrastructure:

- India has **12 major** and **200 non-major/intermediate ports** under state government administration.

- **Jawaharlal Nehru Port Trust** is the largest major port, while **Mundra** is the largest private port.

Maritime India Vision 2030 (MIV 2030):

- A ten-year blueprint for the maritime sector.

- Focuses on boosting waterways, shipbuilding industry, and cruise tourism.

- Aims to develop world-class Mega Ports, transshipment hubs, and modernize port infrastructure.

- Estimated investments of **₹1,00,000-1,25,000 crore** for capacity augmentation and infrastructure development.

Policy Initiatives and Development Projects:

Maritime Development Fund:

- A **₹25,000-crore fund** to provide low-cost, long-term financing for the sector.

- Centre contributing **₹2,500 crore** over seven years.

Port Regulatory Authority:

- Establishment of a **pan-India port authority** under the **new Indian Ports Act**.

- Aimed at enhancing oversight, institutional coverage, and structured growth.

Eastern Waterways Connectivity Transport Grid project:

- Aims to develop regional connectivity with **Bangladesh, Nepal, Bhutan, and Myanmar**.

Riverine Development Fund:

- Provides financing for inland vessels through the **Riverine Development Fund (RDF)**.

- Extending the **tonnage tax scheme** to inland vessels for long-term, low-cost finance.

Rationalization of Port Charges:

- Making port charges **more competitive** and transparent.

Promotion of Water Transport:

- Developing waterways as an **alternative means of urban transport**.

Topic 49. GLOBAL BANKING REGULATORS CRACK DOWN ON G-SIBS

Important for the subject: Economy

Background:

- **Globally systemic banks (G-SIBs)** are required to hold more capital than smaller domestic banks due to their systemic importance.

- This distinction is based on various factors, **determining the "bucket" they fall into, and consequently, the extra capital they must hold.**

- These rules were established a decade ago following the global financial crisis, **during which many banks were bailed out by the money of taxpayers.**

Objective of Crackdown:

- The **Basel Committee**, which includes global banking regulators, aims to address **"unacceptable" attempts** by major banks to **manipulate rules to avoid heavier capital requirements.**

- The goal is to prevent **"window-dressing"** tactics used by **banks to lower their G-SIB scores temporarily.**

Proposed Measures:

- The committee has set out **potential measures** to constrain banks' ability to manipulate their G-SIB scores.

- This includes requiring banks to report and disclose most G-SIB indicators based on **an average of values over the reporting year**, rather than year-end values.

- The intent is to prevent **"regulatory arbitrage behavior"** aimed at reducing banks' perceived systemic risk around reporting dates.

Impact on Reporting:

- Banks participating in the G-SIB assessment exercise would need to provide **more consistent and reliable data** throughout the reporting year.

- This move aims to ensure that **banks cannot exploit temporary fluctuations in their systemic risk indicators.**

Significance of Measures:

- These measures are crucial to **maintain financial stability** and prevent a repeat of the 2008 financial crisis.

- By ensuring that **G-SIBs holdadequate capital, regulators aim to protect taxpayers from bearing the burden of bank failures.**

Conclusion:

- The Basel Committee's proposed measures aim to **strengthen the resilience** of the global banking system.

- By closing loopholes and **preventing banks from gaming the system**, regulators seek to **enhance transparency** and **reduce systemic risks** posed by G-SIBs.

About Window Dressing:

- Window dressing refers to the **practice of manipulating financial statements or transactions to create a more favorable impression of a company's financial position**.

- **Purpose:** Companies engage in window dressing to **make their financial statements appear stronger or more appealing to investors, creditors, or regulators**.

- **Methods:** This can include actions such as:

- **Timing of Transactions:** Shifting certain transactions or sales to the end of a reporting period to inflate revenues.

- **Asset-Liability Management:** Temporarily **removing liabilities from the balance sheet** at reporting dates to improve financial ratios.

- **Misclassification:** Improperly classifying expenses as capital expenditures to **show lower expenses**.

- **Intentions:** The goal of window dressing is **often to present a rosier picture of financial health than actually exists**, which can mislead stakeholders.

G-SIB (Global Systemically Important Bank):

- G-SIBs are banks that are **deemed to be of global systemic importance due to their size, complexity, and interconnectedness** with the global financial system.

- **Designation Criteria:** The Financial Stability Board (FSB) assigns G-SIB status based on a bank's systemic importance, considering factors such as:

- Size

- Complexity

- Global activity

- Interconnectedness with other financial institutions

- **Capital Requirements:** G-SIBs are required to hold more capital than smaller banks to ensure they can withstand financial shocks without destabilizing the financial system.

- **Regulatory Oversight:** G-SIBs are Important for the subject to **enhanced regulatory scrutiny and supervision** to mitigate risks to financial stability.

- **Risk Mitigation Measures:** The designation aims to **prevent G-SIBs from engaging in risky behaviors that could lead to another financial crisis** like of 2008.

- **Impact on Operations:** Banks classified as G-SIBs **must meet specific requirements, such as submitting recovery and resolution plans, to ensure they can be resolved without taxpayer bailouts** if they fail.

Conclusion:

- In essence, "**window dressing" refers to the deceptive practice of manipulating financial data**, while **"G-SIBs" are banks deemed systemically important to the global financial system**.

- The concern arises when **G-SIBs engage in window dressing to present a lower systemic risk profile than is accurate, which can have implications for financial stability and regulatory oversight**. The Basel Committee's measures aim to address these concerns and ensure the integrity of G-SIB assessments.

Topic 50. REVIEW OF NBFC CATEGORISATION BY RBI: POTENTIAL IMPACT AND SIGNIFICANCE

Important for the subject: Economy

The Reserve Bank of India (RBI) is set to **review the categorisation of Non-Banking Finance Companies (NBFCs) in 2024, nearly two years after introducing a revised regulatory framework**.

- This review has become necessary **due to the growth of NBFCs, changes in their business models, and their evolving operations** since the implementation of scale-based regulations.

Purpose of the Review:

- **Evaluation of NBFC Growth:** The review aims to assess the growth trajectory of NBFCs, especially those backed by large corporate houses and conglomerates.

- **Adaptation to Changes:** Given the significant changes in NBFC operations, the review seeks to ensure that regulatory categorisations align with current market dynamics.

Potential Implications:

- **Focus on Large NBFCs:** The review might specifically **focus on NBFCs backed by large corporate entities, considering them for potential re-categorisation.**

- **Precursor to Bank Licences:** There is speculation that the **review could serve as a preliminary step towards granting bank licences to select NBFCs.**

Potential Candidates for Upgradation:

- NBFCs such as Tata Capital, M&M Finance, L&T Finance, and Bajaj Finance are among the names speculated for upgradation to the top layer.

- Currently, **16 NBFCs are in the upper layer, with nine of them led by large business houses.**

Basis of Upgradation:

- **Nuanced Approach:** The RBI is expected to adopt a nuanced approach, considering various parameters for upgradation.

- **Key Parameters:** Factors such as customer grievance handling, technology capabilities, asset quality, in-house operations, management quality, asset-liability management, and liability diversification may be assessed.

- **Case-by-Case Review:** The review process is likely to be case-specific rather than a blanket approach, evaluating each NBFC individually.

Significance of the Review:

- **Alignment with Bank-like Operations:** The review **aims to address the perception among some NBFCs in the upper layer that they already function like banks.**

- **Regulatory Clarity:** RBI Deputy Governor highlighted the existing differences between regulations for banks and NBFCs, suggesting the need for clarity in the categorization.

Current Regulatory Framework:

- **Scale-Based Regulations:** Implemented in October 2021 and fully enforced a year later.

- **Four Layers:** The regulatory framework includes four layers—**base, middle, upper, and top**.

- **Asset Composition:** As of September 30, 2023, NBFCs in the base, middle, and upper layers constituted 6%, 71%, and 23% of total NBFC assets, respectively.

- **No NBFC in Top Layer:** Presently, **no NBFC is listed in the top layer of the regulatory framework.**

- The review of NBFC categorisation by the **RBI signals a proactive approach to adapt regulatory frameworks to the evolving financial landscape**.

- By evaluating key parameters and potentially considering certain NBFCs for upgradation, the **RBI aims to ensure a more effective and aligned regulatory environment for the non-banking finance sector in India**.

- This move also underscores the RBI's focus on maintaining the stability and integrity of the financial system amid changing market dynamics.

Non-Banking Financial Company (NBFC): Overview and Features

- An NBFC is a company registered under the Companies Act, 1956 or 2013, **engaged primarily in financial activities such as:**

- Providing loans and advances

- Acquiring shares, stocks, bonds, debentures, and other securities issued by the government, local authorities, or other entities

- Engaging in leasing and hire-purchase activities

- Conducting insurance and chit fund businesses.

Exclusions:

An institution is not considered an NBFC if its primary business involves:

- Agricultural activities

- Industrial activities

- Purchase or sale of goods (other than securities)

- Providing specific services

- Sale, purchase, or construction of immovable property

Types of NBFCs:

Asset Finance Company (AFC):

- Mainly finances the purchase of machinery, equipment, and other assets

- Leasing and hire-purchase activities are common

Investment Company (IC):

- Primarily deals with acquiring securities

- Invests in shares, stocks, bonds, debentures, etc.

Loan Company (LC):

- Focuses on providing loans and advances

- Often provides personal loans, business loans, and other forms of credit

Infrastructure Finance Company (IFC):

- Specializes in financing infrastructure projects

- Funds construction of roads, bridges, power plants, etc.

Systematically Important Core Investment Company (CIC-ND-SI):

- A category of NBFCs that plays a crucial role in the financial system

- Has a significant impact on the financial stability of the economy

Features of NBFCs:

No Demand Deposits:

- Unlike banks, NBFCs cannot accept demand deposits from the public.

- Demand deposits refer to funds that customers can withdraw on demand, like savings and current accounts.

Non-Participation in Payment System:

- NBFCs are not part of the payment and settlement system.

- They cannot issue checks drawn on themselves, unlike banks that facilitate check-based transactions.

No Deposit Insurance:

- Depositors in NBFCs do not have the benefit of deposit insurance provided by institutions like the Deposit Insurance and Credit Guarantee Corporation (DICGC).

- Deposit insurance protects depositors' funds up to a certain limit in case of the institution's failure.

Focus on Financial Services:

- NBFCs primarily focus on providing financial services such as lending, leasing, investment, and insurance.

- They often cater to specific segments of the market, offering tailored financial products.

Regulated by RBI:

- The Reserve Bank of India (RBI) regulates and supervises NBFCs to ensure stability in the financial system.

- NBFCs must comply with regulatory guidelines, capital adequacy norms, and reporting requirements set by the RBI.

Diverse Business Models:

- NBFCs can have diverse business models, ranging from consumer finance to infrastructure financing.

- They often fill gaps in credit availability, especially for small and medium-sized enterprises (SMEs) and individuals.

Classification of Non-Banking Financial Companies (NBFCs)

- The regulatory and supervisory framework for Non-Banking Financial Companies (NBFCs) is **based on a four-tiered structure.** This classification aims to **differentiate**

between NBFCs based on their systemic importance, potential risks, and impact on financial stability.

Base Layer: NBFC-Base Layer (NBFC-BL)

- NBFCs in the lower layer fall under the **category of NBFC-Base Layer (NBFC-BL).**

- **Least regulatory intervention** is warranted for NBFCs in this layer.

- These NBFCs are considered to have **lower systemic risks and minimal impact** on financial stability.

Middle Layer: NBFC-Middle Layer (NBFC-ML)

- NBFCs in the middle layer are designated as NBFC-Middle Layer (NBFC-ML).

- The regulatory regime for this layer is **stricter compared to the base layer**.

- Measures can be implemented to address adverse regulatory arbitrage compared to banks.

- This **layer aims to mitigate systemic risk spill-overs from NBFCs** falling within this category.

Upper Layer: NBFC-Upper Layer (NBFC-UL)

- NBFCs in the Upper Layer are known as the NBFC-Upper Layer (NBFC-UL) and will have a new regulatory superstructure.

- This layer includes NBFCs with a **large potential for systemic risks and the ability to impact financial stability.**

- The **regulatory framework for NBFCs in this layer will be more akin to that of banks**, with suitable modifications.

- NBFCs identified in the Upper Layer need to meet specific criteria to remain classified as such.

- If an **NBFC-UL does not meet the classification criteria for four consecutive years, it will move out of the enhanced regulatory framework**

Top Layer:

- Ideally, the Top Layer is supposed to remain empty.

- This layer serves as a buffer, **where certain NBFCs from the Upper Layer can be placed if they pose extreme risks.**

- If NBFCs in the Upper Layer are deemed to pose significant risks according to supervisory judgment, they **can be Important for the subject to higher and tailored regulatory requirements.**

- This Top Layer of the classification is intended to be a **contingency for extreme risk scenarios and not a standard classification for NBFCs.**

- The **four-tiered classification of NBFCs aims to create a structured and responsive regulatory framework that aligns with the varying degrees of systemic importance and risk posed by these financial institutions**.

Topic 51. INDIA-EFTA FREE TRADE AGREEMENT

Important for the subject: Economy

Parties Involved:
India and the four-nation European Free Trade Association (EFTA).

EFTA includes **Iceland, Liechtenstein, Norway and Switzerland**

- **Signing Date:** Expected to be signed on March 10, after long negotiations.

Aim of the Agreement:

- Increase **trade and investment flows between** India and EFTA countries.

- **Foster job creation and economic growth** in both regions.

Expected Impact:

- The India-EFTA Trade and Economic Partnership Agreement (TEPA) is **anticipated to attract investments worth $100 billion from the EFTA countries into India.** These investments are projected to occur over the next 15 years.

- The **influx of investments is estimated to generate approximately one million jobs** in India.

Signatories:

- Government officials and industry representatives from all EFTA countries and India are informed about the signing.

First FTA with Investment Commitment:

- This agreement marks the **first Free Trade Agreement (FTA) where India secures commitments on investment and employment** from partner nations.

Trade Deficit Mitigation:

- The India-EFTA TEPA is expected to help **reduce the significant trade deficit that India currently has with the EFTA bloc.**

- In summary, the India-EFTA Trade and Economic Partnership Agreement (TEPA) is set to be signed on March 10, aiming to **bolster trade, attract investments, create jobs, and address trade deficits between India and the European Free Trade Association (EFTA) countries of Switzerland, Finland, Norway, and Liechtenstein**.

- This agreement is notable as it secures commitments on investment and employment, potentially bringing substantial economic benefits to both sides.

TEPA – Trade and Economic Partnership Agreement:

- A Trade and Economic Partnership Agreement (TEPA) is a **type of economic partnership agreement between countries.** It offers flexibility in **negotiating terms and conditions, tailored to the specific needs and interests of the involved parties.**

Objective of TEPA:

- Aims to boost bilateral trade and economic cooperation between India and EFTA.

- Goals include **reducing tariffs and non-tariff barriers, enhancing market access, and promoting investment flows.**

About EFTA – European Free Trade Association:

- **Establishment:** Founded in 1960.

- **Member Countries:** Iceland, Liechtenstein, Norway, and Switzerland.

- **Headquarters:** Geneva.

- **Purpose:** To **promote free trade and economic cooperation** among member states and with other countries.

- **Relationship with EU:** EFTA has a close relationship with the EU, **having signed several agreements facilitating the free movement of goods, services, capital, and people** between EFTA countries and the EU.

Strengths of EFTA Countries:

- These economies rank among the **highest globally in innovation, competitiveness, wealth creation per inhabitant, life expectancy, and quality of life**.

- EFTA companies are leaders in **pharmaceuticals, biotechnology, machinery manufacturing, R&D-driven technology produc**ts, and more.

Trade with India:

- EFTA is **India's 9th largest trading partner**, accounting for 2.5% of India's total merchandise trade in 2020-21.

- Main Indian exports to EFTA: **textiles, chemicals, gems, jewelry, machinery, and pharmaceuticals.**

- Main Indian imports from EFTA: **machinery, chemicals, precious metals, and medical instruments.**

Potential Benefits of TEPA between India and EFTA States:

Trade:

- India's growth and leadership in **green technologies** could benefit from EFTA's support.

Market Access:

- Improved access for Indian goods to EFTA markets, where **EFTA export products often serve as inputs in Indian export industries.**

Investment:

- Expected increase in investment from EFTA states (already over USD 35 billion invested in India).

Mutual Benefits:

- EFTA states can benefit from **India's skilled workforce in the services sector**.

- India can **benefit from the 400+ companies established by EFTA states, generating over 150,000 jobs.**

Renewable Technologies:

- EFTA states can **contribute cutting-edge technologies in solar, wind, hydro, and geothermal power to India's green growth aspirations**.

Challenges in Implementing TEPA between India and EFTA Countries:

Economic Structure:

- EFTA countries focus on high-tech industries, while **India's industries generally serve lower and middle-tech sectors.**

Market Access:

- Addressing issues related to **tariffs, quotas, and non-tariff barriers** for free and fair trade.

Regulatory Differences:

- **Variances in regulations, standards, and legal frameworks** between India and EFTA countries.

Securing Domestic Manufacturers:

- Particularly important in sectors where **EFTA countries have a competitive edge, such as pharmaceuticals and machinery manufacturing**.

Environmental and Social Considerations:

- Addressing challenges like **promoting sustainable development and gender equality**.

Conclusion:

- For a successful TEPA between India and EFTA, **addressing outstanding issues, identifying areas of mutual benefit, and promoting collaboration on skilled labor are**

crucial. Strong political involvement and guidance are necessary for a swift negotiation process.

Topic 52. EOUS AND SEZS TO GET RODTEP SOPS UNTIL SEPTEMBER 30

Important for the subject: Economy

The announcement made by the Centre regarding the **Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme includes the eligibility of outbound shipments from Special Economic Zones (SEZs) and Export Oriented Units (EOUs)** for tax refunds. **This move is significant as SEZs and EOUs collectively account for about a quarter of India's total exports.**

Scope of Eligibility:

- Outbound shipments from SEZs and EOUs will now qualify for tax refunds under the RoDTEP Scheme.

- This extends the benefit of the **RoDTEP Scheme to these entities, recognizing their substantial contribution to India's export landscape**.

Advance Authorisation (AA) Scheme:

- Exporting firms utilizing the **Advance Authorisation (AA) scheme** will also be covered under the RoDTEP Scheme.

- The AA scheme **allows duty-free import of inputs that are physically incorporated into the exported products.**

- By including AA scheme users, the **RoDTEP Scheme aims to incentivize and support exporters who rely on duty-free imports for their manufacturing processes**.

Objective:

- The RoDTEP Scheme is designed to **promote exports by refunding duties and taxes incurred on the export of goods.**

- By providing tax refunds, the **scheme aims to make Indian exports more competitive in the global market and boost the country's overall export performance**.

Commerce and Industry Minister's Statement:

- Commerce and Industry Ministry announced the **extension of the RoDTEP Scheme to SEZs, EOUs, and AA scheme users.**

- This move is part of the government's efforts to **support and promote the growth of India's export sector, particularly in key areas such as SEZs and EOUs**.

Significance:

- SEZs and EOUs play a crucial role in India's export ecosystem, offering various benefits and incentives to businesses operating within these zones.

- By including these entities under the RoDTEP Scheme, **the government aims to further encourage exports from these zones, thereby driving economic growth and employment.**

About SEZs:

- An SEZ is a designated territory within a country that **operates under special economic regulations and incentives.**

- **Purpose**: SEZs are established to **encourage investment, boost exports, create employment opportunities, and enhance ease of doing business**.

Evolution in India:

- Asia's first Export Processing Zone (EPZ) was set up in Kandla, Gujarat in 1965.

- India **shifted from EPZs to SEZs in 2000** to address infrastructural and bureaucratic challenges.

- The **Special Economic Zones Act was enacted in 2005, with the rules coming into effect in 2006.**

Current Status of SEZs in India:

Number and Location:

- India presently has 378 notified SEZs, out of which 265 are operational, as on March 2021

- The majority of SEZs, about 64%, are located in five states: **Tamil Nadu, Telangana, Karnataka, Andhra Pradesh, and Maharashtra.**

- **Apex Body**: The Board of Approval, headed by the Secretary of the Department of Commerce, oversees SEZs.

Baba Kalyani Committee:

- In 2018, the Ministry of Commerce and Industry formed the **Baba Kalyani-led committee to evaluate and suggest improvements to the SEZ policy.**

- The committee aimed to **align the SEZ policy with global best practices** and make it WTO-compatible.

Major Incentives and Facilities:

- Duty-free import or domestic procurement of goods for SEZ units' development, operation, and maintenance.

- Exemption from various taxes such as Income Tax and minimum alternate tax.

- External commercial borrowing by SEZ units up to US $500 million annually.

- Single window clearance for approvals at the Central and State levels.

Challenges Faced:

Underutilized Land:

- Lack of demand for SEZ space, exacerbated by disruptions caused by the pandemic.

Multiple Economic Zone Models:

- Challenges in integrating various models like SEZs, coastal economic zones, industrial corridors, etc.

Competition from ASEAN Countries:

- ASEAN countries' policies attracting global investments to their SEZs, leading to increased competition.

About Export Oriented Units (EoUs)

- EOUs, or Export Oriented Units, are **industrial plants or facilities set up for the purpose of producing goods or services primarily for export.**

- These units are established under the Export Oriented Unit (EOU) Scheme which is governed by the **Directorate General of Foreign Trade (DGFT) in India.**

Purpose:

- **Export Focus**: EOUs are dedicated to **producing goods and services specifically for export markets.**

- **Boost Exports**: The main objective of EOUs is to **promote exports from India by providing certain incentives and facilities to manufacturers.**

Benefits and Incentives:

- **Duty-Free Imports**: EOUs can import raw materials, components, and capital goods without paying customs duties.

- **Tax Benefits**: Exemption from Central Excise duty on goods procured domestically for production.

- **Foreign Exchange**: EOUs can retain and utilize 100% of foreign exchange earnings.

- **Infrastructure Support**: Access to infrastructure facilities like customs clearance, banking, and security services.

- **Simplified Procedures**: Single-window clearance for various approvals and licenses.

Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme:

- The RoDTEP scheme, introduced to replace the Merchandise Export from India Scheme (MEIS), has been notified by the Government of India, outlining rates and norms to support exporters.

- **Objective:** To refund embedded central, state, and local duties or taxes that were not previously rebated, addressing the non-compliance issues with the World Trade Organization (WTO) rules.

Key Features:

Scope:

- Covers 8,555 tariff lines, constituting around 75% of traded items and 65% of India's exports.

- Budgetary allocation of ₹12,454 crore for the fiscal year 2021-22.

Zero Rating of Exports:

- Aims to achieve zero rating of exports by ensuring that domestic taxes are not exported.

Refund Mechanism:

- Refunds encompass all taxes, including those levied by states and local bodies.

- Refund rates, considered WTO-compliant, range from 0.5% to 4.3% of the Free On Board (FOB) value of outbound consignments.

Rate Variation:

- Rates vary based on the product category. For example:

- Lowest rates for items like chocolates, toffees, and sugar confectionery.

- Highest rates for yarns and fibers.

- Exclusion of certain sectors like steel, pharma, and chemicals.

International Standards and Automatic Refunds:

- **Enables Indian exporters to meet international standards for exports.**

- **Provides affordable testing and certification within the country, reducing dependence on international organizations.**

- **Facilitates automatic tax assessment and refunds for GST, streamlining the process for exporters.**

- **The RoDTEP scheme aligns with India's efforts to facilitate a conducive environment for exporters, promoting economic growth and enhancing the country's position in the global market.**

About Advance Authorization Scheme

- The Advance Authorization Scheme, implemented by the Directorate General of Foreign Trade (DGFT) under the Foreign Trade Policy, is a **encouraging program for exporters in India**.

Overview:

- The Advance Authorization Scheme **allows for the duty-free import of inputs that are necessary for the production of export goods**.

- These inputs can include raw materials, components, parts, packaging materials, fuel, oil, and catalysts that are **used or consumed in the manufacturing process of export products.**

Purpose:

- The main objective of the scheme is to promote exports by **enabling exporters to import inputs without paying duty. This reduces the cost of production for export goods, making them more competitive in the global market.**

Benefits:

Simplified Process:

Shorter Turnaround Times:

Ease of Doing Business:

Reduced Compliance Burden:

- **Validity:** An Advance Authorization is **typically valid for 12 months** from the date of its issue. During this period, the authorized holder can import the specified quantity of duty-free inputs for use in the production of export goods.

Conclusion:

- The Advance Authorization Scheme is a valuable tool for Indian exporters, offering them the opportunity to **import necessary inputs without incurring duty costs**.

- The **creation of a searchable norms database by the DGFT further enhances the scheme's efficiency, enabling exporters to benefit from shorter processing times, reduced compliance burdens, and improved competitiveness in international markets**.

- This trade facilitation measure aligns with the government's efforts to promote exports and boost the country's economic growth.

Topic 53. JAPAN NEARS INTEREST RATE HIKE: FINANCIAL MARKETS GEAR UP FOR TRANSITION

Important for the subject: Economy

In a dramatic shift in Japan's financial markets, rising interest rates are looming on the horizon, a phenomenon not seen in decades.

Transition to Rising Interest Rates:

- Japanese financial markets are **preparing for an imminent rise in interest rates**, signaling the end of a long era of monetary policy experimentation.

- The Bank of Japan (BOJ) is expected **to exit its negative short-term rate policy by June, with a possibility of rates rising to zero as early as next week.**

Implications for Financial Instruments:

Government Debt Market:

- Investors are positioning themselves to **benefit from selling short-dated government bonds.**

- A rise in central bank deposit rates **could lead banks to shift capital out of bonds and into cash, impacting the government debt market**.

Foreign Exchange Market:

- The market, heavily short on the yen, is **adjusting to paying interest, albeit small, on the Japanese currency.**

- A reversal in short yen positions has already begun, indicating the market's response to the changing interest rate scenario.

Equity Market:

- Equity investors have been optimistic, particularly in bank shares, expecting growth in loans and margins.

Market Expectations and Challenges:

- Investors and policymakers **view higher wages and shifts in corporate attitudes as new factors influencing the interest rate hike.**

- **Longer-term changes in Japan are considered underpriced by markets,** with potential for a longer hiking cycle if consumption and wages support each other.

Challenges Ahead:

- The **transition from unconventional monetary policies will take time** and could have long-lasting effects on the economy.

- Smaller businesses may face challenges **from higher borrowing costs, while crowded bets on bank stocks could see losses.**

- A potential yen rally could trigger global repercussions, **particularly in "carry" trades funded in yen.**

Conclusion:

- Japan's journey toward higher interest rates marks a significant shift in its monetary policy landscape. **Financial markets are bracing for these changes, with implications for various asset classes and global trading strategies**.

- The move reflects Japan's efforts to revive its economy and attract investment, but it also poses challenges in unwinding the distortions of prolonged unconventional policies. As markets adjust to this new era, **investors will closely monitor developments for potential opportunities and risks.**

Zero Interest-Rate Policy (ZIRP):

- Zero Interest-Rate Policy (ZIRP) is an **unconventional monetary policy tool used by central banks to stimulate economic growth and combat deflation.**

- In a ZIRP environment, the central bank sets its benchmark interest rate at or near zero percent. **The aim is to encourage borrowing, spending, and investment by making the cost of borrowing extremely low.**

- **Stimulating Economic Activity**: By lowering interest rates to zero, the central bank seeks to encourage businesses and individuals to borrow money for investments, such as capital expenditures or home purchases. This increased spending can stimulate economic growth.

- **Boosting Consumer Spending**: With lower borrowing costs, consumers may be more inclined to take out loans for big-ticket items like cars and homes. This boosts consumption, which is a key driver of economic activity.

- **Lowering the Cost of Debt Servicing**: For existing borrowers, ZIRP reduces the cost of servicing debt, freeing up funds that can be spent or invested elsewhere.

- **Fighting Deflation**: ZIRP is often used in times of deflationary pressure when prices are falling. By encouraging spending and investment, central banks aim to combat deflation and achieve a modest level of inflation, typically around 2%.

- **Supporting Asset Prices**: Low interest rates can also lead to higher asset prices, such as stocks and real estate, as investors seek better returns than those offered by traditional savings accounts or bonds.

While ZIRP can have positive effects on the economy, there are also potential drawbacks and risks:

- **Impact on Savers**: With interest rates near zero, savers earn minimal returns on their savings accounts, CDs, and other fixed-income investments. This can be challenging for retirees and those relying on interest income.

- **Asset Bubbles**: Persistently low interest rates can lead to excessive risk-taking and asset bubbles, as investors chase higher returns in riskier assets.

- **Limited Effectiveness**: ZIRP may lose its effectiveness over time, especially if it remains in place for an extended period. Central banks may then need to resort to other unconventional monetary policies.

- **Impact on Banks**: Banks' profitability can be squeezed under ZIRP, as their net interest margins shrink due to lower interest rates on loans.

Negative Interest Rate Policy (NIRP):

- Negative Interest Rate Policy (NIRP) takes ZIRP a **step further by setting the central bank's policy rate below zero. In a NIRP environment, banks are effectively charged for holding excess reserves with the central bank, instead of earning interest on those reserves.**

Key features of Negative Interest Rate Policy (NIRP) include:

- **Encouraging Lending and Spending**: NIRP aims to incentivize banks to lend money rather than hold excess reserves. By charging banks for deposits, central banks hope to spur lending to businesses and consumers, boosting economic activity.

- **Pushing Down Market Interest Rates**: When the central bank charges negative rates on reserves, it can lead to lower market interest rates on loans and mortgages. This can encourage borrowing and stimulate demand for credit.

- **Weakening the Currency**: Negative rates can also put downward pressure on a country's currency. When investors earn lower returns on investments denominated in that currency, they may seek higher returns elsewhere, leading to currency depreciation.

- **Combatting Deflation**: Similar to ZIRP, **NIRP is used to combat deflationary pressures and stimulate inflation to reach central bank targets.**

- **While NIRP shares some similarities with ZIRP, it introduces additional complexities and potential challenges:**

- **Impact on Bank Profits**: NIRP can squeeze bank profits even further than ZIRP, especially if they are unable to pass negative rates on to depositors.

- **Potential for Disruption in Financial Markets**: Negative rates can distort financial markets, leading to unusual behavior such as investors hoarding cash or seeking alternative investments.

- **Concerns for Savers and Pension Funds**: NIRP poses challenges for savers, pension funds, and insurance companies, which struggle to generate positive returns in a low or negative interest rate environment.

- **Limits to Effectiveness**: Like ZIRP, NIRP may face diminishing returns if implemented for an extended period, potentially requiring other policy tools to achieve central bank objectives.

- **Both ZIRP and NIRP are unconventional monetary policies used during times of economic distress or when traditional tools like adjusting interest rates are no longer effective.** They come with benefits in terms of stimulating economic activity but also carry risks and challenges that policymakers must carefully consider.

Topic 54. RBI'S SELL/BUY SWAP TO ADDRESS LIQUIDITY AHEAD OF TAX OUTFLOWS

Important for the subject: Economy

The Reserve Bank of India (RBI) recently conducted a $5-billion sell/buy swap on March 8, 2022, **aimed at augmenting rupee liquidity in the banking system**.

Purpose of the Swap:

- The RBI conducted the **two-year sell/buy swap to enhance dollar liquidity** in the market.

- In a sell/buy foreign exchange swap, **a bank buys US dollars from the RBI and agrees to sell the same amount of US dollars at the end of the swap period.**

Liquidity Outflows Ahead:

- The banking system is expected to **witness outflows of about ₹3.7-lakh crore from March 15 to 20.**

- These outflows are primarily **due to direct tax and Goods and Service Tax (GST) payments**.

RBI's Decision Not to Roll Over:

- The RBI reportedly chose not to roll over the swap, which means **banks will receive rupee liquidity, and the RBI will get dollar liquidity.**

- By taking this step, the RBI aims to **address the liquidity deficit anticipated in the banking system due to the upcoming tax outflows.**

Expected Liquidity Boost:

- Tripathi estimates that about **₹40,000 crore of liquidity could accrue to the banking system with the RBI taking delivery of the swap.**

- Additionally, the **forex reserves of India will receive a boost by an equivalent amount in dollar terms.**

- The RBI's decision not to roll over the swap is seen as **an effort to alleviate this impending liquidity crunch.**

- In summary, the **RBI's sell/buy swap was a strategic move to manage liquidity ahead of significant tax outflows expected in the banking system**.

- By not rolling over the swap, the **RBI aims to infuse rupee liquidity while bolstering its forex reserves with dollar liquidity**.

- This decision is aimed at addressing the liquidity challenges anticipated due to the tax payments in mid-March.

Dollar–Rupee Swap Auction: An Overview

- A Dollar–Rupee Swap auction is a **strategic foreign exchange (forex) tool used by central banks to manage currency liquidity in the banking system**.

Purpose and Function:

- The central bank, such as the Reserve Bank of India (RBI), **conducts Dollar–Rupee Swap auctions to either infuse or withdraw liquidity from the banking system.**

Types of Dollar–Rupee Swaps:

Dollar–Rupee Buy/Sell Swap:

- In this type of swap, the **central bank buys US dollars (USD) from banks in exchange for Indian Rupees (INR).**

- Simultaneously, the central bank commits to selling the same amount of dollars back to the banks at a later date.

- This type of swap is **used to inject rupee liquidity into the banking system**.

Dollar–Rupee Sell/Buy Swap:

- Conversely, in a sell/buy swap, the **central bank sells US dollars to banks.**

- In return, the central bank receives an equivalent amount in rupees, effectively reducing the rupee liquidity in the banking system.

- This type of swap is **used to manage excess liquidity or tighten liquidity conditions**.

Risk Management:

- Dollar–Rupee Swap auctions are **structured to mitigate exchange rate and market risks.**

- Transaction terms, including the exchange rate and dates for buying and selling, are predetermined and set in advance.

- This pre-agreed framework **helps the central bank and participating banks manage their exposure to currency fluctuations.**

Liquidity Management:

- The primary objective of these auctions is to **regulate liquidity conditions within the banking system.**

- By buying or selling dollars against rupees, **the central bank can influence the amount of rupee liquidity available to banks.**

- This, in turn, impacts **interest rates, credit availability, and overall economic conditions**.

Role in Monetary Policy:

- Dollar–Rupee Swap auctions are part of the central bank's monetary policy toolkit.

- They allow the **central bank to fine-tune liquidity levels, manage interest rates, and stabilize financial markets.**

Benefits and Impact:

- **For Banks:** Participating banks benefit by managing their short-term liquidity needs.

- **For Central Bank:** The central bank **maintains control over the money supply, influencing economic growth and inflation.**

- In summary, Dollar–Rupee Swap auctions play a crucial role in the central bank's efforts to manage currency liquidity in the banking system.

- They provide a mechanism for **injecting or withdrawing rupee liquidity, helping to regulate interest rates, credit availability, and overall economic stability**.

- These auctions are structured to **minimize risks for both the central bank and participating banks while serving as an essential tool in monetary policy implementation**.

Topic 55. CABINET APPROVES AMBITIOUS INDIA AI MISSION TO STRENGTHEN THE AI INNOVATION ECOSYSTEM

Important for the subject: Schemes

In furtherance to the vision of **Making AI in India and Making AI Work for India**, the Cabinet chaired by the Prime Minister Shri Narendra Modi has approved the comprehensive national-level India AI mission with a budget outlay of Rs.10,371.92 crore.

- The Mission will be implemented by **'India AI' Independent Business Division (IBD) under Digital India Corporation (DIC).**

Components under the mission:

IndiaAI Compute Capacity:

- The IndiaAI compute pillar will build a high-end scalable AI computing ecosystem to cater to the increasing demands from India's rapidly expanding AI start-ups and research ecosystem.

- The ecosystem will comprise AI compute infrastructure of 10,000 or more Graphics Processing Units (GPUs), built through public-private partnership.

- An AI marketplace will be designed to offer AI as a service and pre-trained models to AI innovators.

- It will act as a one-stop solution for resources critical for AI innovation.

IndiaAI Innovation Centre:

- The India AI Innovation Centre will undertake the development and deployment of indigenous Large Multimodal Models (LMMs) and domain-specific foundational models in critical sectors.

IndiaAI Datasets Platform:

- The IndiaAI Datasets Platform will streamline access to quality non-personal datasets for AI Innovation.

- A unified data platform will be developed to provide a one-stop solution for seamless access to non-personal datasets to Indian Startups and Researchers.

IndiaAI Application Development Initiative:

- The IndiaAI Application Development Initiative will promote the AI applications in critical sectors for the problem statements sourced from Central Ministries, State Departments, and other institutions.

- The initiative will focus on developing/scaling/promoting adoption of impactful AI solutions with potential for catalyzing large scale socio-economic transformation.

India AI Future Skills:

- India AI Future Skills is conceptualized to mitigate barriers to entry into AI programs and will increase AI courses in undergraduate, masters-level, and Ph.D. programs.

- Further, Data and AI Labs will be set-up in Tier 2 and Tier 3 cities across India to impart foundational level courses.

IndiaAI Startup Financing:

- The IndiaAI Startup Financing pillar is conceptualized to support and accelerate deep-tech AI startups and provide them streamlined access to funding to enable futuristic AI Projects.

Safe & Trusted AI:

- Recognizing the need for adequate guardrails to advance the responsible development, deployment, and adoption of AI, the Safe & Trusted AI pillar will enable the implementation of Responsible AI projects including the development of indigenous tools and frameworks, self-assessment checklists for innovators, and other guidelines and governance frameworks.

Topic 56. WORKSHOP ON 'COUNT OF PASTORALISTS AND THEIR LIVESTOCK IN 21ST LIVESTOCK CENSUS'

Important for the subject: Schemes

The **Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying** organized a workshop on 'Count of Pastoralists and their Livestock in 21st Livestock Census' in Indore, Madhya Pradesh.

About Livestock Census:

- The **Department of Animal Husbandry and Dairying conducts livestock census across the country every 5 years since 1919.**

- The last livestock census i.e. **20th LC was conducted in 2019.**

- The **21st livestock census is due in 2024.**

- There is a demand to collect the information on **Pastoralists and their livestock in 21st Livestock Census.**

- The livestock census is the main source of data for proper planning and formulation of the **Livestock Welfare Programme for bringing further improvement in this sector.**

- The livestock census usually covers all domestic animals and head counts of these animals which includes various species of animals **(cattle, buffalo, mithun, yak, sheep, goat, pig, horse, pony, mule, donkey, camel, dog, rabbit and elephant)/poultry birds (fowl, duck and other poultry birds)** possessed by the households, household enterprises/non-household enterprises at that site Breed-wise with their age, sex.

Topic 57. DEPARTMENT OF CONSUMER AFFAIRS CONDUCTS STAKEHOLDERS MEETING ON RIGHT TO REPAIR PORTAL INDIA

Important for the subject: Schemes

The Hon'ble Prime Minister envisioned the **Mission LiFE (Lifestyle for the Environment) for replacing 'use-and-dispose' economy — with a 'circular economy'** promoting 'mindful and deliberate utilization' in place of mindless and wasteful consumption.

- **Circular Economy also incorporates R3 concept i.e. Reduce, Reuse (repair) and Recycle.**

- **The Department of Consumer Affairs (DoCA)** has taken a significant step through the launch of the Right to Repair Portal India (https://righttorepairindia.gov.in/) on the occasion of National Consumer Rights Day 2022.

- The portal provides consumers to avail repair associated information for their **products and reduce e-waste.**

- Stakeholders were called on the basis of grievances registered at the National Consumer Helpline.

Right to Repair Portal:

- Right to Repair Portal India encompasses to facilitate and works as a catalyst for providing relevant repair associated information between the companies and consumers.

The information includes:

- Access to product manuals/ repair videos (by linking the websites and YouTube channels of the companies);

- Address the concern on the price and warranty of spare parts;

- Explicit mention on differences in liability covered guarantee, warranty and extended warranty;

- Details of Companies Service Centre across India and Recognition third-parties repairers, if any, by the companies and

- Information on country of origin to be explicitly mentioned.

Topic 58. PM LAUNCHES PRADHAN MANTRI SAMAJIK UTTHANEVAM ROZGAR ADHARIT JANKALYAN (PM-SURAJ) PORTAL

Important for the subject: Schemes

The Ministry of Social Justice and Empowerment launched a nationwide initiative aimed at offering credit support to the marginalized segments of society

- During the event, PM unveiled the **'Pradhan Mantri SamajikUtthan and Rozgar AdharitJankalyan' (PM-SURAJ) national portal online** which symbolized the ministry's dedication in placing the underprivileged at the forefront, towards uplifting the most marginalized sections of society, and supported credit assistance to one lakh entrepreneurs hailing from disadvantaged communities.

- Prime Minister Shri Modi personally interacted with beneficiaries from various states who have been benefited under schemes like **NAMASTE, VCF-SC, VCF-BC, ASIIM from disadvantaged groups, that includes Scheduled Castes, backward classes, and Safai Mitras.**

- **Ayushman health cards and personal protective equipment (PPE) kits** were distributed by the ministry to sewer and **septic tank workers (Safai Mitras) under the National Action for Mechanized Sanitation Ecosystem (NAMASTE).**

- **Credit support to 1 lakh entrepreneurs of disadvantaged sections** has been sanctioned under PM SURAJ scheme.

About NAMASTE scheme:

- **NAMASTE scheme to eradicate unsafe sewer** and septic-tank cleaning practices introduced by the **Ministry of Social Justice and Empowerment.**

Main features of the Scheme to be implemented in all ULBs are:-

- **Identification: NAMASTE envisages** identifying the Sewer/Septic Tank Workers (SSWs).

- **Occupational Training and distribution** of PPE Kits to SSWs.

- **Assistance for Safety Devices** to Sanitation Response Units (SRUs).

- **Extending Health Insurance Scheme Benefits** to identified SSWs and their families under the Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).

- **Livelihood Assistance:** The Action Plan will promote mechanization and enterprise development by providing funding support and subsidy (capital +interest) to the sanitation workers, to procure sanitation related equipment.

- **IEC Campaign:** Massive campaigns would be undertaken jointly by the ULBs & NSKFDC to spread awareness about the interventions of NAMASTE.

Topic 59. CENTER ISSUES DIRECTIVE TO PREVENT TAILGATING AT AIRPORT E-GATES

Important for the subject: Schemes

The Bureau of Civil Aviation Security (BCAS) has asked airports and airlines to **use better technology and assign more manpower resources** to prevent passengers from tailgating through automatic gates at various check-points.

What is tailgating (piggybacking)?

- Tailgating, sometimes referred to as piggybacking, is a type of physical security breach in which an unauthorized person follows an authorized individual to enter secured premises.

- Tailgating is one of the simplest forms of a social engineering attack.

- It is an easy way for an unauthorized party to get around security mechanisms that are assumed to be secure

More on news:

- The government directive follows **two serious security breaches within a span of 10 days** in February, when ticketless travelers were able to enter the passenger building at Mumbai airport and even enter the boarding gate.

- **Digi Yatra, a biometric-based boarding system**, which allows passengers to use their facial scan as a ticket, has been rolled out at 13 airports so far and 24 more airports will get the facility in 2024.

- **E-gate manufacturers have been asked to improve their technology to ensure that two passengers cannot pass through them at the same time.**

About Digi Yatra:

- The project is being implemented by the DigiYatra Foundation — **a joint-venture company whose shareholders are the Airports Authority of India (26% stake) and Bengaluru Airport, Delhi Airport, Hyderabad Airport, Mumbai Airport and Cochin International Airport hold the remaining 74% of the shares.**

- In the first phase, the initiative will be launched at seven airports, starting with three — Delhi, Bengaluru, and Varanasi, followed by four airports namely Hyderabad, Kolkata, Pune, and Vijayawada by March 2023.

- The facial recognition system at various airports across the globe, including Dubai, Singapore, Atlanta and Narita (Japan), have helped bring in efficiency.

Key features of the initiative and how it works–

- **Centralized registration system for passengers** and each of them would get a unique ID on booking the tickets

- **ID can be created by sharing name, e-mail id, mobile number and details of any identity proof, including Aadhaar**

- The airline would share the **passenger data and the ID** with the airport from where the passenger would be flying out

- **Optionally linking of Aadhaar to airlines** at the time of booking for faster airport entry and automated check-ins without requiring any paper-based interventions

- **A biometrics-based digital processing system** for passenger entry and related requirements at the airport

- Voluntary for passengers on whether to opt for facial recognition biometric for air travel

- The Digi Yatra platform would be **operational by February 2019**

- Will be available at **major airports in the country**

- Real-time notifications about congestion and delays of flights

- Passengers would be notified when their luggage reaches the baggage claim belt.

Topic 60. CABINET APPROVES UTTAR POORVA TRANSFORMATIVE INDUSTRIALIZATION SCHEME 2024

Important for the subject: Schemes

The Union Cabinet chaired by Prime Minister Shri Narendra Modi approved the proposal of the Ministry of Commerce and Industry, **Department for Promotion of Industry and Internal Trade for Uttar Poorva Transformative Industrialization Scheme, 2024 (UNNATI – 2024)** for a period of 10 years from the date of notification along with 8 years for committed liabilities at a total cost of Rs.10,037 crore.

About the scheme:

- **Government of India has formulated New Industrial Development Scheme, UNNATI (Uttar Poorva Transformative Industrialization Scheme), 2024** as a Central Sector Scheme for the development of Industries and generation of employment in the states of North East Region.

- The scheme's main objective is to generate gainful employment, which will lead to the area's overall socio-economic development.

- It will create productive economic activity in the **manufacturing and service sectors**.

- This will be a **Central Sector Scheme.**

Salient features of the scheme:

- **Scheme period:** The scheme will be effective from the date of Notification and up to 31.03.2034 along with **8 years of committed liabilities.**

- **Application period for registration:** Industrial unit will be allowed to apply for registration from the date of notification up to 31.03.2026

- **Grant of registration:** All applications for registration shall have to be disposed of by 31.03.2027

- **Commencement of Production or operation:** All eligible Industrial Units to commence their **production** or operation within 4 years from the grant of registration.

- **Districts are categorized in two zones:** Zone A (Industrially Advanced Districts) & Zone B (Industrially Backward Districts)

- **Earmarking of funds:** 60% of the outlay of Part A has been earmarked to 8 NE states and 40% on First-In-First-Out (FIFO) basis.

- **For Micro industries (defined as per MSME industry norms)**, the P&M calculation will include the building construction and P&M costs for Capital Investment Incentive.

- **All new Industrial units and Expanding units** would be eligible for the respective incentives.

Implementation strategy:

- **DPIIT** will implement the scheme in cooperation with the states. Implementation will be overseen by following committees at the national and state levels.

- **The Steering Committee, headed by the Secretary, DPIIT (SIIT)**, will decide upon any interpretation of the scheme within its overall financial outlay and issue detailed guidelines for execution.

- **The State Level Committee, headed by the state's Chief Secretary,** will monitor implementation, checks and balances, ensuring transparency and efficiency.

- The Secretary Level Committee, headed by the senior Secretary of the state (Industries), will be responsible for implementing the scheme, including the recommendation of registration and incentives claims.

Incentives under the scheme:

Where GST is applicable	Where GST is not applicable
- Capital Investment Incentive (For Both New & Expanding Units): - Zone A: 30% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 5Cr. Zone B: 50% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 7.5 Cr.	- Capital Investment Incentive (For Both New & Expanding Units): - Zone A: 30% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 10 Cr. Zone B: 50% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 10
Central Capital Interest Subvention (For Both New & Expanding Units): Zone A: 3% interest subvention offered for 7 years Zone B: 5% interest subvention offered for 7 years	Capital Investment Incentive (For Both New & Expanding Units): Zone A: 30% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs. 10 Cr. Zone B: 50% of eligible value of investment in plant and machinery / construction of building & durable physical assets with cap of Rs
Central Capital Interest Subvention (For Both New & Expanding Units): Zone A: 3% interest subvention offered for 7 years Zone B: 5% interest subvention offered for 7 years	Central Capital Interest Subvention (For Both New & Expanding Units): Zone A: 3% interest subvention offered for 7 years Zone B: 5% interest subvention offered for 7 years

Manufacturing & Services linked incentive (MSLI) – For New Units only – linked to Net Payment of GST, i.e., GST paid less Input Tax Credit with upper limit. Zone A: 75% of eligible value of investment in P&M Zone B: 100% of eligible value of investment in P&M	Nil

Maximum Eligible benefits to one unit from all components of the scheme: Rs. 250 Cr.

Topic 61. NUTRITIONAL CRISIS: INDIA HAS MOST 'ZERO-FOOD' CHILDREN AT 6.7 MILLION; THIRD HIGHEST PREVALANCE AMONG 92 LMICS

Important for the subject: Schemes

A recent study highlights the **alarming prevalence of children aged 6-23 months** in **92 low- and middle-income countries (LMIC)** who **did not consume any food over 24 hours.**

Definition of 'Zero-food' Children:

- **'Zero-food' children** refer to those who **did not consume any animal milk, formula, or solid or semisolid food during the last 24 hours.**

- This category is **critical** because, at **approximately six months of age, breastfeedingalone is insufficient to meet the nutritional needs of a child.**

- Introducing **solid or semisolid foods** alongside breastfeeding is essential for fulfilling the nutritional needs of early childhood, playing a pivotal role in child growth and development.

 Details:

- **India,** with **6.7 million 'zero-food' children,** leads the **count,** constituting **nearly half of the surveyed group's total**.

- This is despite the crucial need for solid or semisolid foods alongside breastfeeding to meet the nutritional requirements during early childhood, crucial for growth and development.

- **India ranks third highest globally,** with **19.3% of children not receiving food**, following **Guinea (21.8%)** and **Mali (20.5%).**

- **Nigeria** and **Pakistan** also report **significant numbers of 'zero-food' children,** stressing the urgent need for targeted nutritional interventions in these regions.

Study findings:

- The study analysed data from **demographic and health surveys (DHS)** and **multiple indicator cluster surveys (MICS)** covering **276,379 children** across **92 LMICs**. The analysis focused on **feeding practices,** excluding **breastfeeding** and **liquid feedings outside of a sensitivity analysis.**

- **13.9 million children (10.4% of the sample)** had **not consumed any food in the last 24 hours.**

- **South Asia** and **West and Central Africa** reported the **highest prevalence** of **'zero-food'** instances.

- Over **99% of 'zero-food' children** had been breastfed during the same period, indicating they received some form of nutrition.

- **Latin America** and the **Caribbean,** and **East Asia** and the **Pacific,** showed the **lowest prevalence of 'zero-food' children**.

Implications:

- The study underscores the significant impact of **adequate feeding on reducing mortality,** and **malnutrition,** and **improving brain development and school readiness**.

Government initiatives to curb malnutrition in India:

- **Integrated Child Development Services (ICDS) Scheme:** It was launched in **1975** and the program **aims to** provide food, preschool education, primary healthcare, immunization, health checkups, and referral services to children under 6 years old and their mothers.

- **Pradhan Mantri Matru Vandana Yojana (PMMVY):** It is a **Centrally Sponsored DBT scheme** with a **cash incentive of ₹ 5000/-** (in three instalments) being provided directly in the bank/post office account of **Pregnant Women and Lactating Mothers**.

- **National Nutrition Mission (NNM):** The government of India has launched the National Nutrition Mission (NNM), also known as **POSHAN Abhiyaan,** to eradicate malnutrition by the year **2022**.

- **Anaemia Mukt Bharat Abhiyan:** The mission was launched in 2018 to accelerate anaemia decline by one to three percentage points annually.

- **Mid-day Meal (MDM) scheme:** It aims to improve nutrition levels among school children in addition to increasing enrolment, retention, and attendance.

- **National Food Security Act (NFSA), 2013:** NFSA Assuring food and nutrition security for the most vulnerable is the aim of this law, which makes access to food a legal entitlement.

National Nutrition Strategy by NITI Aayog:

- The nutrition strategy envisages a framework wherein **4 proximate determinants of nutrition – uptake of health services, food, drinking water** and **sanitation** and **income and livelihoods** work together to accelerate the decline of **malnutrition** in India.

- The Strategy envisages a **Kuposhan Mukt Bharat** – linked to **Swachh Bharat and Swasth Bharat.** Focus on **behavioural change.**

- The **aim** is to ensure that States create customized State/ District Action Plans to address local needs and challenges with a greater role for panchayats and urban local bodies.

Topic 62. SELA TUNNEL

Important for the subject: Geography

Prime Minister Shri Narendra Modi virtually dedicated to the nation the Sela Tunnel project during the Viksit Bharat Viksit North East programme in Itanagar, Arunachal Pradesh on March 09, 2024

- The tunnel has been constructed by the Border Roads Organisation (BRO) at an altitude of 13,000 feet on the road connecting Tezpur, Assam to Tawang in the West Kameng district of Arunachal Pradesh.

- Built at a total cost of Rs 825 crore, the tunnel will provide all-weather connectivity to Tawang across Sela Pass on the Balipara – Chariduar – Tawang Road, boosting the preparedness of the Armed Forces and augmenting the socio-economic development of the border region.

- The Sela Tunnel, **a strategically vital infrastructure project in Arunachal Pradesh**, is nearing completion.

- Sela Tunnel will provide all-weather connectivity and improve the ease of travel for the people of Tawang

- The Sela Tunnel has been **excavated below the Sela Pass, a high-altitude mountain pass situated at an elevation of 4,200 meters (13,800 feet) above sea level**.

- The region **experiences heavy snowfall and landslides, leading to frequent closures of the pass, effectively cutting off Tawang from the rest of Arunachal Pradesh.**

Topic 63. LAUNCH OF EXPLORATION LICENCE FOR CRITICAL AND DEEP-SEATED MINERALS BY THE STATES OF KARNATAKA AND RAJASTHAN – A FIRST IN THE COUNTRY

Important for the subject: Geography

Karnataka and Rajasthan launched an auction of Exploration Licence (EL) for critical and deep seated minerals on 06.03.2024.

- Exploration License blocks are being auctioned for the first time in the country.

- **Karnataka** launched an auction of one block of **Gold, Copper and Lithium and Rajasthan launched an auction of three blocks of Rare Earth Elements, Rare Metal and Potash minerals.**

- The **Mines and Minerals (Development and Regulation) Act, 1957 was amended through the MMDR Amendment Act, 2023**, to introduce a new mineral concession of Exploration Licence for 29 critical and deep-seated minerals to further boost exploration and mining of critical and deep-seated minerals in the country.

About the Critical Minerals:

- **Critical minerals** refer to mineral resources, both primary and processed, which are essential inputs in the production process of an economy, and whose supplies are likely to be disrupted due to the risks of non-availability or unaffordable price spikes.

- Minerals such as **antimony, cobalt, gallium, graphite, lithium, nickel, niobium, and strontium are among the 22 assessed to be critical for India.**

- Critical and deep-seated minerals such as **Cobalt, Lithium, Nickel, Gold, Silver, and Copper** are difficult to explore and mine as compared to surficial or bulk minerals.

- The exploration license granted through auction shall permit the licensee to undertake reconnaissance and prospecting operations for critical and deep-seated minerals mentioned in the newly inserted **Seventh Schedule to the MMDR Act.**

Minerals can broadly be divided into two categories:

- **Surficial deposits:** minerals such as iron ore, bauxite, limestone, dolomite, manganese, chrome, etc.

- These minerals are mostly found on surface or shallow depths, although some of them are also worked underground such as manganese and chromite in India and iron ore (Kiruna) in Sweden.

- Deep-seated / concealed deposits: minerals such as gold, lead, zinc, copper, nickel, PGMs, diamond, REE etc. These are mostly deep-seated or concealed but are also worked open cast such as copper in Malanjkhand, gold (super-pit mine) in Western Australia.

- **Deep-seated minerals** such as gold, silver, copper, zinc, lead, nickel, cobalt, platinum group of minerals, diamonds, etc. are high value minerals. It is difficult and expensive to explore and mine these minerals as compared to surfacial/ bulk minerals.

- These minerals are extremely critical for new age electronics, transition to clean energy (solar, wind, electric vehicles) as well as in traditional sectors like infrastructure, defence, etc.

Topic 64. DAHEJ: MAJOR REASON FOR LARGE SEMICONDUCTOR INVESTMENTS IN GUJARAT

Important for the subject: Geography

Ashwini Vaishnaw, the Union Minister of Railways, Communications, and Electronics & Information Technology, highlighted the significant **influence of Dahej's large chemical cluster on attracting major semiconductor investments to Gujarat's South-west coast**.

- The Union Cabinet sanctioned the creation of **three semiconductor units** as part of the **initiative to develop the semiconductor** and **display manufacturing ecosystems** in **India**, with construction set to commence within 100 days of approval.

- In June 2023, **Micron** received approval to **establish a semiconductor unit in Sanand, Gujarat.**

- **Tata Electronics,** in collaboration with **Powerchip Semiconductor Manufacturing Corp (PSMC) from Taiwan**, plans to build a **semiconductor fab in Dholera, Gujarat,** investing **₹91,000 crore**.

- Additionally, **CG Power** will collaborate with **Renesas Electronics Corporation** from **Japan** and **Stars Microelectronics** from **Thailand** to **create a semiconductor facility** in **Sanand, Gujarat,** with a **₹7,600 crore investment**.

- **Tata Semiconductor Assembly and Test Pvt Ltd** is also set to establish a **semiconductor unit** in **Morigaon, Assam,** with an investment of **₹27,000 crore**

Semiconductor manufacturing:

- The **semiconductor manufacturing process** requires nearly **250 speciality gases** and **chemicals,** which the **Dahej chemical cluster can provide,** making it an **attractive location for semiconductor investments**.

- This has led to a **strategic gravitation** towards areas with established **chemical industries.** The expectations are for the addition of more **fabrication plants** and **assembly, testing, marking, and packaging (ATMP) units** within the next five years.

- The government's **Semiconductor Mission** aims to establish a comprehensive semiconductor value chain in India, encompassing design, fabrication, ATMP, and leveraging the country's talent pool and resources.

- The inauguration of **Qualcomm's Chennai Design Centre** marks a significant step in completing the **semiconductor ecosystem and value chain in India.**

- Emphasizing the importance of advancing beyond **2G** to **lead** in **5G** and **6G** technologies, the role of **Tamil Nadu** as a **talent hub** and the **Qualcomm Design Centre's contribution to semiconductor design** is immense

Dahej industrial cluster:

- Located in the **Bharuch district** of **Gujarat** and spread over 76.30 sq. km., **Dahej** has potential for **new MSMEs** for sectors like **agro, livestock, forest** and **demand-based industries.**

- The **major exportable items** include **dyes intermediate and chemicals, bulk drugs and pharmaceuticals. Lignite, silica and ball clay** are the major minerals and **black trap, sand, hard murrum** and **gravel** are the minor minerals found in **Dahej**.

Topic 65. CHINA LITHIUM BOOM SLOWS AS SAGGING PRICES BATTER HIGH-COST MINERS

Important for the subject: Geography

The **decline in lithium prices,** essential for **electric vehicle (EV) batteries**, is **negatively affecting China's lithium mining industry,** particularly the **mining of lepidolite,** a **type of hard rock ore costly to process into lithium.**

- Lithium is mined from ores of **petalite (LiAl(Si2O5)2, lepidolite K(Li,Al)3(Al,Si,Rb)4O10(F,OH)2, spodumene LiAl(SiO3)2** and also **subsurface brines.**

Decreased lithium mining in China:

- This trend is due to **decreased EV demand globally,** causing **lithium prices** to drop significantly—over **80%** in the past year according to **Benchmark Mineral Intelligence**.

- **Benchmark Mineral Intelligence** also known as **Benchmark Minerals,** founded by **Simon Moores** in **2014,** is a **London-based IOSCO-regulated Price Reporting**

Agency (PRA) and **specialist information provider** for the **lithium-ion battery** to **electric vehicle (EV) supply chain.**

- **China**, responsible for about **a quarter of global lithium production in 2023,** is expected to see a substantial impact on its **lepidolite mining operations** due to these **lower prices** and the **high cost of extraction**.

- **Rystad Energy** has significantly **reduced its growth forecast for China's mined lithium output in 2024** to **12%** from an initial **54%,** mainly because of the challenges facing **lepidolite mining**.

- The **cost of processing lithium** from **lepidolite** in **China** is significantly **higher** than from other sources like **brine deposits** and **spodumene,** making **lepidolite mining economically unfeasible** in the current price environment

Lithium mines in China:

- **China,** ranking **fourth globally in lithium reserves,** has been actively promoting investment to increase its **lithium mining capacity, aiming** to **fulfil the battery sector's demands and reduce import dependency.**

- A significant focus has been on the **southern province of Jiangxi,** known for its recent **lepidolite projects**.

- These projects, such as **CATL's Jianxiawo mine** and **Yongxing's Huashan mine,** have been challenged by the **lower lithium content in kaolinite, a clay mineral,** making production costly at about **1,20,000 yuan per ton of lithium carbonate equivalent (LCE).**

- **CATL** acquired exploration rights for the **Jianxiawo mine** with an 865 million yuan bid.

Lithium Production in the World:

- According to the US Geological Survey (USGS), global lithium production in 2019 stood at 77,000 tonnes.

- **Australia, Chile, China and Argentina are the world's top four lithium-producing countries.**

- Australia is by far the world's top producer of lithium, with an output of 42,000 tonnes in 2019.

About lithium

- Lithium is a **non-ferrous metal** and is one of the key components in EV batteries.

- It has the symbol Li and is a chemical element.

- It's a **silvery-white metal** with a delicate texture.

- It is the **lightest metal and the lightest solid element** under normal circumstances.

- It must be kept in mineral oil since it is very reactive and combustible.

- It is **both an alkali and a rare meta**

Lepidolite:

- **Lepidolite** is a lilac-gray or rose-colored member of the **mica group of minerals** with the chemical formula K(Li,Al)3(Al,Si,Rb)4O10(F,OH)2.

- It is the **most abundant lithium-bearing mineral** and is a **secondary source of this metal**. It is the **major source of the alkali metal rubidium**.

- **Lepidolite** is found with other **lithium-bearing minerals,** such as **spodumene,** in **pegmatite bodies**. It has also been found in **high-temperature quartz veins, greisens** and **granite**.

Topic 66. BACKED BY BRAHMOS, THE NAVY'S MINICOY BASE TO KEEP WATCH OVER THE ARABIAN SEA

Important for the subject: Geography

INS Jatayu:

The **Indian Navy** is significantly enhancing its capabilities with the establishment of **INS Jatayu** on **Minicoy Island in Lakshadweep**. This new base will feature **advanced radar systems, jetties, an airfield,** and **coastal batteries** equipped with **BrahMos supersonic cruise missiles**.

- Additionally, new infrastructure and facilities were inaugurated at the **Karwar naval base** in **Karnataka**, including **major piers and residential accommodations,** enhancing the living conditions for officers and civilian defence personnel.

- The **inclusion of extended-range BrahMos missiles** and **new radar facilities** at **Minicoy** is intended to **improve India's surveillance capabilities** and **provide a flexible response to threats**.

Importance of 'INS Jatayu' naval base:

- This upgrade aligns with **India's long-term plan to bolster its security presence in strategic locations,** particularly to counter the **expanding Chinese naval activities** in the **Indian Ocean.**

- The importance of this base is underscored by its proximity to the **critical Sea Lanes of Communication (SLOC)** and its position a few hundred miles from the **Maldives**.

- It also aims to strengthen India's position in the emerging global maritime order, contributing to the Maritime Domain Awareness network and enhancing the capabilities of the **Quad Alliance**.

- The development also aimed at **boosting tourism** and **accommodating increased demand from tourists**, such as the expansion of the **Agatti airfield** and the development of a **dual-use airfield in Minicoy** with a longer runway.

Karwar naval base (INS Kadamba):

- Code named **Project Seabird.**

- **It** has undergone significant expansion since its **Phase I completion in 2011,** which initially allowed accommodation for **10 ships**.

- This expansion includes the **Cabinet Committee on Security-approved Phase IIA,** significantly enlarging the **base's capacity to berth 32 ships and submarines, plus 23 yardcraft**. **Phase IIA** features include extensive **berthing space, technical facilities, electrical substations,** and an **iconic Covered Dry Berth** for **simultaneous maintenance** of **up to four capital ships**.

- This phase also introduces **four townships providing around 10,000 dwelling units** for various personnel and a **dual-use naval air station** with a **2,700-metre runway alongside a civil enclave for commercial flights.**

Unique features:

- The Navy's aircraft carrier **INS Vikramaditya** is based at **Karwar**.

- The base also has the **country's first sealift facility,** a unique **"shiplift"** and **transfer system** for **docking** and **undocking ships** and **submarines.**

Significance:

- Once fully operational, the expanded base is expected to **house approximately 50,000 individuals,** significantly benefiting the local economy.

- The expansion underscores the **strategic importance of maintaining robust naval capabilities,** especially considering the ongoing maritime security challenges, such as **drone and missile attacks in the Red Sea** and **piracy in the Gulf of Aden,** emphasizing the **critical role of sea lanes in global trade,** with over **90%** of **India's trade transiting by sea**.

Minicoy island:

- **Minicoy,** locally known as **Maliku**, is an island in Lakshadweep, India.

- Along with **Viringili,** it is on **Maliku atoll,** the **southernmost atoll of the Lakshadweep archipelago**.

- Administratively, it is a census town in the Indian union territory of Lakshadweep.

- The **island** is situated **425 km west of Trivandrum,** the **capital city of Kerala**.

- The **Eight Degree Channel** separates the **islands of Minicoy** and **Maldives**.

- The **Nine Degree Channel** separates the **island of Minicoy** from the **main Lakshadweep archipelago**.

Topic 67. BENGALURU WATER CRISIS: IS THE SOUTHERN METROPOLIS HEADING TOWARDS DAY ZERO?

Important for the subject: Geography

Bengaluru, India's third-most populous city, faces its **most severe potable water crisis** in its **nearly 500-year history.** Over **30 localities** are receiving water on a rotational basis every other day, risking reaching a **'Day Zero' scenario** akin to **Cape Town in 2018.**

- **Day Zero:** The day when the municipal water supply for this major city was estimated to run out.

Causes of water crisis:

- The crisis is attributed to the **destruction of water bodies and wetlands** due to **real estate expansion since 1990,** mirroring **Cape Town's experience**.

- **Bengaluru** now relies on **distant river water,** compromised by recurring droughts.

- A **2016 International Lake Conference** predicted this scenario, citing government policies over the past **30 years** that **favored urban development over environmental preservation**.

Impact of Urbanisation:

- A study by the **Indian Institute of Science** highlights the **negative effects of unplanned urbanisation** on **Bangalore's ecology, hydrology,** and **environment.** It points to **increased pollution, water scarcity,** and **mismanagement of waste** due to **rapid urban expansion.**

Deterioration of Lakes:

- **Bengaluru's 262 lakes in 1961** have **dwindled to 81,** mainly due to **real estate developments.**

- Only **33** of these **lakes** remain **functional**, protected by their location in **non-reclaimable zones.Pollution** has significantly **reduced the quality and sustainability of these water sources**.

Government and Community Response:

- The **Karnataka government** has advised focusing on areas with **contaminated wells and directed Urban Local Bodies (ULBs)** to **protect water bodies** by removing encroachments and penalising waste dumping.

- Meanwhile, **Resident Welfare Associations (RWAs)** have implemented **water rationing, banned non-essential water usage,** and are **exploring alternative**

conservation methods, such as using disposable cutlery and wet wipes to reduce water consumption.

Lake in news:

- Several species of birds are being sighted at **Doddakallasandra Lake** in **South Bangaluru**.

Details:

- The lake became a **temporary habitat** for several bird species including **painted storks, black-headed ibis, little egrets, sandpipers, black-winged stilts, cormorants, grey-headed swamphens, peacocks,** and **glossy ibises.**

- Many of these birds, characterized by their long legs and bills, depend on wetlands for foraging.

- **Painted storks,** listed as **"Near Threatened"** on the **IUCN Red List,** were among the notable visitors with their distinctive pink flight feathers. **Purple swamphens** were also seen engaging in playful chases.

Topic 68. A TRIBE IN THE WESTERN GHATS IN NEED OF A LIFELINE

Important for the subject: Geography

The **Makuta village** houses a **Girijan colony** inhabited by the **'Phani Yerava' tribe.** In **2021,** with local assistance, **all 19 Yerava households successfully claimed forest land rights** under the **Forest Rights Act,** covering **135 acres** historically occupied by their ancestors.

- The **Makuta village** is in the **Western Ghats' Kodagu district, Karnataka,** part of the **Talacauvery sub-cluster** and is **one of the 10 World Heritage Sites in Karnataka**. This area is known for its **dense tropical evergreen forests.**

- The findings are part of a larger research study titled **"Tribals, Forest Rights and Heritage Conservation: A Study of Western Ghats in Karnataka,"** sponsored by the **Indian Council of Social Science Research, New Delhi.**

- The study suggests a need for **targeted policies to support tribal communities** facing **socio-economic hardships** and **addiction problems,** advocating for a holistic approach to improving their quality of life.

Key findings:

- Despite obtaining **forest rights,** the **tribe's enthusiasm** is dampened by the diminishing returns and increasing hardships of **forest-dependent livelihoods.**

- The **tribal community** now **primarily engages in daily labour,** often travelling to nearby Kasaragod, Kerala, for work due to better wages and language comfort.

- While still **collecting minor forest produce** like **fuelwood, honey, dhoopa (incense),** and **shekakai (soap pod),** most of it is for personal consumption without stockpiling, indicating a shift away from the **traditional forest-based economy.**

About Forest Rights Act, 2006:

- The Forest Rights Act (FRA), 2006 recognizes the rights of the **forest-dwelling tribal communities and other traditional forest dwellers to forest resources, on which these communities were dependent for a variety of needs, including livelihood, habitation and other socio-cultural needs.**

Objectives:

- To undo the **historical injustice** that occurred to the forest-dwelling communities.

- To **ensure land tenure, livelihood and food security of the forest-dwelling Scheduled Tribes and other traditional forest dwellers.**

- To **strengthen the conservation regime** of the forests by including the responsibilities and authority of Forest Rights holders for sustainable use, conservation of biodiversity and maintenance of ecological balance.

What Rights Do Forest Dwellers Get Under the Act?

- The Forest Rights Act, of 2006 recognises **three types of Rights:**

Land Rights:

- The Act gives the forest dwellers the right to ownership land farmed by them, Important for the subject to a **maximum of 4 hectares per family.**

- Ownership is only for land that is actually being cultivated by the concerned family and no new lands can be granted.

- The land cannot be sold or transferred to anyone except by inheritance.

Use Rights:

- The rights of the dwellers extend to extracting **Minor Forest Produce** (such as tendu patta, herbs, medicinal plants etc.), grazing areas, to pastoralist routes, etc.

- Minor forest produce **does not include timber.**

Right to Protect and Conserve:

- The Act gives the forest-dwelling communities the right to protect and manage the forest.

- This is vital for the thousands of village communities protecting their forests and wildlife against threats from forest mafias, industries and land grabbers.

Who Can Claim These Rights?

- Members or community of the Scheduled Tribes who primarily reside in and who depend on the forests or forest lands for bonafide livelihood needs.

- It can also be claimed by any member or community who has **for at least three generations (75 years) before 13th December 2005** primarily resided in forest land for bona fide livelihood needs.

How Are These Rights Recognised?

- **Section 6 of the Forest Rights Act, 2006** provides a transparent three-step procedure for deciding on who gets rights:

- **Step-1:** Gram Sabha makes a recommendation – i.e. who has been cultivating land for how long, which minor forest produce to be collected, etc.

- **Step-2**: The Gram Sabha's recommendation goes through two stages of screening committees at the Taluka and District levels.

- **Step-3**: The District Level Committee makes the final decision. The committees have six members – three government officers and three elected persons.

Topic 69. MEGHALAYA'S BYRNIHAT MOST POLLUTED 'CITY' IN INDIA

Important for the subject: Environment

In February, **Byrnihat,** an **industrial town** on the **Meghalaya-Assam border,** was identified as **India's most polluted city** according to a **report** by the **Centre for Research on Energy and Clean Air (CREA).**

Details of the report findings:

- This report, highlighting the **issue of air pollution in urban centres of the Northeast**—a region typically perceived as the **greenest part of India**—revealed **Byrnihat's PM2.5 levels to be significantly high**, with a **monthly average concentration of 183 μg/m^3.**

- This level not only **surpassed** that of **Bihar's Araria,** the **second-most polluted city**, by approximately **60 μg/m^3** but was also nearly **1.8 times higher than the PM2.5 concentration in Delhi,** ranked as the **14th most polluted city** for the same month.

- The findings also placed other **northeastern urban centers—Nalbari (5th**), **Agartala (12th), Guwahati (19th),** and **Nagaon (28th)**—among the **top 30 most polluted cities in India** for February.

- This suggests a concerning trend of escalating pollution levels across the region. Furthermore, **out of 11 cities in the northeastern states** with continuous ambient air quality monitoring stations, **six exceeded the daily National Ambient Air Quality Standards (NAAQS)** prescribed by the **Central Pollution Control Board** for **PM2.5** levels, indicating a pressing environmental challenge in these areas.

Cleanest cities:

- Conversely, cities like **Sivasagar,** **Silchar,** **Aizawl,** and **Imphal** in the **northeast** recorded **PM2.5 concentrations below the National Ambient Air Quality Standards (NAAQS),** marking them as the **cleanest in the region.**

- However, **none of these cities met the World Health Organization's (WHO) safe guideline concentrations for PM2.5.**

- This situation underscores the urgent need for **enhanced air quality monitoring and management,** especially given the environmental degradation attributed to unregulated industrial activities, insufficient public transportation, and poor construction practices among other factors.

- The report also noted an **overall improvement in air quality across India in February,** with an **increase in cities** classified under the **'good'** and **'satisfactory'** categories and a **decrease** in those categorized as **'moderate,'** **'poor,'** and **'very poor.'**

- This improvement was attributed to **better wind speeds, rising temperatures,** and **possibly reduced emissions,** reflecting a positive trend in efforts to tackle air pollution.

Centre for Research on Energy and Clean Air (CREA):

- CREA is an **independent research organisation** focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution.

- They use scientific data, research and evidence to support the efforts of governments, companies and campaigning organisations worldwide in their efforts to move towards clean energy and clean air.

- They believe that effective research and communication are the key to successful policies, investment decisions and advocacy efforts.

- Registered as a **nonprofit** in **Finland**, with **staff across Asia and Europe.** Their work is **funded** through **philanthropic grants** and **revenue from commissioned research**.

Topic 70. SUPREME COURT STOPS ASSAM'S MOVE TO WITHDRAW NOTIFICATION OF POBITORA WILDLIFE SANCTUARY

Important for the subject: Environment
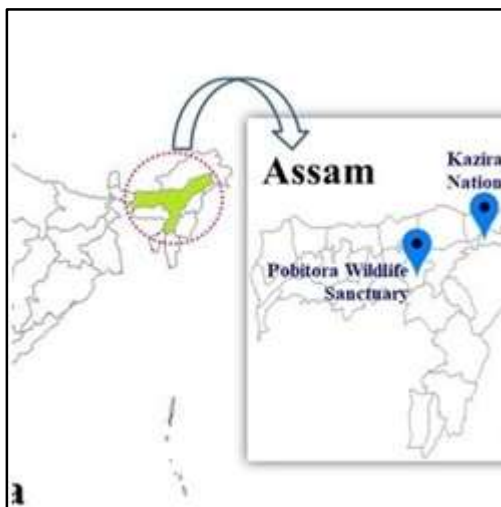
The **Supreme Court** halted the **Assam government's attempt to withdraw a notification from March 17, 1998,** that established the **Pobitora wildlife sanctuary,** a **crucial habitat for one of the largest rhino populations in India**.

Concerns Over Sanctuary Declaration:

- The government highlighted that the **sanctuary's declaration overlooked the rights of villagers from marginalized communities** in **Thengabhanga, Murkata,** and **Mayong,** who have lived in the area since before India's independence.

- Following the **withdrawal of the 1998 notification,** the **government formed a committee** to **assess the rights and claims of forest dwellers** and to **reconsider the declaration of the Pobitora region as a wildlife sanctuary**.

- **Justice B.R. Gavai** emphasized that **withdrawing a notification declaring a wildlife sanctuary requires approval from the National Board of Wildlife** and noted previous orders against the **dereservation of protected areas.** The Court found the withdrawal **"ex facie illegal."**

- Assam's counsel argued that the **withdrawal aimed to correct a past error in land demarcation,not to dismantle the sanctuary.**

- The justices affirmed the government's responsibility towards both the sanctuary and the rights of forest dwellers.

Pobitora Wildlife Sanctuary:

- **Pobitora Wildlife Sanctuary** is situated in the **flood plains** of **River Brahmaputra** in the district of **Morigaon** in the state of **Assam**.

- It harbours the **highest density of Rhino in the world** and the **second highest concentration of Rhino** in **Assam** after **Kaziranga National Park.**

- It is often called **'Mini Kaziranga'** because of the **similar landscape** and the **sizeable population of the one-horned rhino.**

- **Fauna:** Leopard, Leopard cat, Fishing cat, Jungle cat, Feral Buffalo, Wild pigs, Chinese pangolins, etc.

- **Flora:** Its maximum consists of the wet savannah of Arundo donax and Saccharum. The remaining area is covered by water bodies.

Topic 71. COUNTRIES HOPE TO BRING BBNJ OR HIGH SEAS TREATY INTO FORCE BY 2025; ONLY 2 HAVE RATIFIED IT SO FAR

Important for the subject: Environment

The **Blue Leaders High-Level Event on Biodiversity Beyond National Jurisdiction** was held in **Belgium** on March 7, 2024, **aiming** to **encourage nations to ratify a new treaty** focused on **protecting the high seas from threats like pollution, climate change, and overfishing.**

Treaty Details:

- The **treaty for the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction (BBNJ Treaty)** was agreed upon in **March 2023** and **formally adopted two months later**.

- The treaty **focuses** on **increasing protected marine areas, equitable sharing of profits from marine genetic resources,** and **establishing guidelines for Environmental Impact Assessments (EIA) for ocean activities**.

- Countries such as **Belgium, Cape Verde, Greece, Monaco, Nigeria, Norway,** and **the UK** participated in the event.

- To date, **88 countries** have **signed the treaty,** with **Chile** and **Palau** being the **only two to have ratified it**.

- The treaty will officially come into force **once 60 countries ratify it**.

Goals and Challenges:

- The treaty **aims** to address the **lack of protection in the high seas**, which constitute over **two-thirds of the global ocean** yet have **only 1.44% designated as protected areas.**

- It also **aims** to **ensure fair distribution of benefits from marine genetic resources** and to set protocols for **environmental impact assessments of oceanic activities.**

Implementation and Future Efforts:

- After **ratification,** significant efforts will be required to operationalize the treaty, including establishing **procedures, budgets**, and **deciding on the location for the Secretariat,** with **Belgium** offering to **host it in Brussels**.

- Additionally, there is a **push to protect at least 30% of marine life by 2030,** a target that aligns with the **"Kunming-Montreal Global Biodiversity Framework."**

- **Effective conservation and sustainable use of marine biodiversity** under the **BBNJ Treaty** will require **strong scientific support**.

What is the BBNJ Treaty?

- The "BBNJ Treaty", **also known as the "Treaty of the High Seas"**, is an international agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, **currently under negotiation at the United Nations**.

- The treaty will be**legallybinding**in nature.

- This new instrument is**being developed within the framework of the UNCLOS,**the main international agreement governing human activities at sea.

- It will achieve **a more holistic management of high seas activities,** which should better balance the conservation and sustainable use of marine resources.

- BBNJ **encompasses the high seas, beyond the exclusive economic zones or national waters of countries**.

- According to the**International Union for Conservation of Nature (IUCN)**, these areas account for **"almost half of the Earth's surface"**.

- These areas are**hardly regulated and also least understood or explored** for its biodiversity – only 1% of these areas are under protection.

An important element under the treaty: The **benefit sharing of marine genetic resources (MGRs).**

- It includes marine plants, animals and microbes from areas beyond national jurisdiction.

- The **element aims** to address the inequalities in sharing benefits from samples, basic and applied research results as well as monetary benefit sharing from MGRs.

- Launched at the **One Ocean Summit** in February 2022, the **High Ambition Coalition on Biodiversity Beyond National Jurisdiction** brings together many delegations engaged in the BBNJ negotiations on a common and ambitious outcome at the highest political level.

- The negotiations are **centred around a package of elements** agreed upon in 2015, namely:

- the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, in particular, together and as a whole, marine genetic resources, including questions on the sharing of benefits

- area-based management tools, including marine protected areas

- environmental impact assessments

- capacity-building and the transfer of marine technology

India's Stance and Global Concerns:

- **India** has **not signed the treaty** but **expressed support for its implementation at the G20 New Delhi Leaders' Declaration** in September 2023.

- There are concerns about **potential delays** in **ratification,** reminiscent of the lengthy process for the **United Nations Convention on the Law of the Seas.**

- However, there's optimism due to strong political momentum and support for the treaty.

Topic 72. MEANT TO REDUCE STRESS ON BIG CATS, WHY SAFARI PARKS MAY BE A DOUBLE-EDGED SWORD

Important for the subject: Environment

On March 6, the **Supreme Court** expressed its willingness to **approve the creation of a Tiger Safari** at **Pakhrau** within the **buffer zone** of the **Corbett tiger reserve.** This initiative is intended **exclusively for local tigers** that are injured, have been involved in conflicts, or are orphaned, explicitly excluding tigers from zoos.

What is tiger safari?

- A **"tiger safari"** is a concept that emerged within the realm of **wildlife tourism**, specifically **aimed** at **facilitating the viewing of tigers within their natural or semi-natural habitats.**

- Although **not explicitly defined under The Wildlife (Protection) Act, 1972,** the idea gained formal recognition in the **Guidelines for Tourism** issued by the **National Tiger Conservation Authority (NTCA) in 2012**.

- These guidelines envisaged **tiger safaris within the buffer areas of tiger reserves, primarily** to **manage the high tourist influx in the core habitats critical for tiger conservation**.

- By **2016,** the **NTCA** had issued more **specific guidelines for establishing Tiger Safaris** in **buffer** and **fringe areas** of **tiger reserves,** explicitly for **rehabilitating injured, conflicted,** or **orphaned tigers.**

- These **guidelines** emphasized that **tigers for these safaris should not be sourced from zoos.** However, in a notable shift in policy in **2019,** the **NTCA permitted the introduction of animals from zoos into tiger safaris** and delegated the responsibility of selecting such animals to the **Central Zoo Authority (CZA).**

- The **Supreme Court,** however, has criticized the idea of **housing zoo tigers or other captive animals in tiger habitats,** highlighting the risk it poses to wild tigers and other wildlife due to potential **disease transmission**.

- The court has suggested that the **NTCA's approach** of considering **tiger safaris as zoos within tiger reserves contradicts** the **core objectives of tiger conservation**.

But why build a tiger safari in a forest?

- The **construction of tiger safaris within forests** is **primarily** motivated by the **intent to mitigate the adverse effects of tourism on wildlife within tiger reserves.**

- **Safari parks offer these animals a chance to live in an environment** that closely **resembles their natural habitat.**

- The establishment of safari parks in buffer areas aligns with the **dual objectives** of **supporting the livelihood and developmental needs of local communities** while simultaneously **generating revenue and fostering positive attitudes towards tiger conservation.**

Challenges:

- Historical data indicates that **creating new safari routes** to manage tourism demand in tiger reserves often results in **increased tourist influx** rather than its intended reduction.

- The practice of showcasing **"rescued" tigers** in **safari parks** marks a departure from previous norms, which favoured **non-display facilities** for such animals**.**

- Conservationists raise **ethical concerns,** arguing that the **concept of housing "rescued" wildlife in safari parks** prioritizes the welfare of individual animals over the broader interests of the species and conservation goals.

What is the ground reality in Corbett and elsewhere?

- The **Pakhrau Safari Park** planned on the south western edge of the **Corbett Tiger Reserve** near **Uttar   Pradesh**, **aims** to   avoid **disrupting   tiger   and   wildlife movements** towards the **Rajaji tiger reserve** by utilizing an **existing forest road without necessitating tree cutting.**

- This **initiative** seeks to extend the **economic benefits of tiger tourism** beyond the **Ramnagar area,** which has so far capitalized on its proximity to **Corbett,** aiming to promote **livelihood and development opportunities** on the **reserve's other side**.

- However, parallels drawn with the **Ranthambhore safari park** in **Rajasthan,** intended for rescued tigers to alleviate tourism pressure and boost local livelihoods, suggest caution.

- Since its **conception in 2015-16,** the project has faced repeated setbacks, with attempts to construct peripheral walls collapsing and necessitating continuous repairs.

- Prior to the **Supreme Court's recent restriction on using zoo animals for such parks,** various safari parks within protected forests, like the **Nahargarh Biological Park** inaugurated in **2016,** have featured animals from zoos, including **Asiatic lions** and **Royal Bengal tigers,** among others.

- This practice, however, has proven problematic for territorial species, leading to stress and aggressive behaviour, as seen with **resident leopards** reacting to captive ones in **Nahargarh**, indicating the **complex dynamics** and challenges involved in **integrating safari parks within natural wildlife habitats**.

Topic 73. 7396 GOLDEN LANGURS IN INDIA, REVEALS SURVEY

Important for the subject: Environment

A recent survey conducted by a collaboration of **wildlife research and conservation organizations,** including the **Primate Research Centre NE India (PRCNE), Assam Forest Department, Bodoland Territorial Council, Salim Ali Centre for Ornithology and Natural History (SACON),** and **Conservation Himalayas,** has estimated the population of **golden langurs** in **India** at **7,396 individuals**.

- This **endangered primate, Trachypithecusgeei,** is found exclusively in the **Manas Biosphere Reserve** and **fragmented forests in western Assam.**

- The survey was conducted in **two phases**, first covering the **western part of the Manas Biosphere Reserve**, including the newly upgraded **Raimona National Park** and several reserve forests, and then focusing on **fragmented habitats** in **Bongaigaon, Kokrajhar,** and **Dhubri districts.**

- Utilizing the **block count method** for the first time for **golden langurs,** the habitat was divided into 51 blocks, surveyed by teams of trained enumerators and forest staff.

- The survey identified **7,720 individuals** in **706 groups** and **31 lone or floating males,** leading to an estimated minimum population of **7,396** in **707 groups,** including both **bisexual** and **male bands**, along with **lone males.**

- The population is divided into **two major sub-populations:** a northern extended population in the **Manas Biosphere Reserve,** estimated at **5,566 individuals** in **534 groups,** and a **southern fragmented population** estimated at **1,830 langurs** in **173 groups**.

Golden langur:

- **Gee's golden langur (Trachypithecusgeei),** also known as simply the **golden langur,** is an **Old World monkey** found in a **small region of Western Assam, India** and in the neighbouring foothills of the **Black Mountains of Bhutan.**

- Long considered sacred by many Himalayan people. Adult males have a cream to golden coat with darker flanks while the females and juveniles are lighter.

- It **lives in high trees** and has a **herbivorous diet of fruits, leaves, seeds, buds** and **flowers**

- It is **one of the most endangered primate species** of **India** and **Bhutan.**

- In **2008-09,** there were **6,000 golden langurs in India,** which has grown to **7,396 in 2020-21.**

- **IUCN Red List:** Endangered

- **CITES:** Appendix-I

Unstable situation:

- The latest population estimation reveals that the **Ripu Reserve Forest** hosts the **largest northern population of golden langurs** with **2,847 individuals,** while the **Chakrashila Wildlife Sanctuary** in the **Kokrajhar** district harbours the most in the **southern fragmented range with 838 langurs.**

- Despite this **population growth**, the survey report signals an **unstable situation in the golden langurs' fragmented habitats,** primarily due to the **absence of non-breeding all-male bands.**

- To mitigate the challenges posed by this fragmentation and the ensuing **anthropogenic threats,** the primatologists recommend the creation of corridor linkages among these habitats.

- These corridors, potentially established through plantations and canopy bridges, aim to facilitate safer movement for the langurs across their disjointed habitats.

Topic 74. SCIENTISTS GENETICALLY MODIFY 'SEXUAL' FRUIT FLY TO REPRODUCE ASEXUALLY

Important for the subject: Environment

In a recent development, researchers from **Cambridge University** and the **California Institute of Technology** achieved a significant milestone by **engineering a sexually reproducing species of fruit fly (Drosophila melanogaster) to reproduce asexually.**

- This **transformation,** demonstrating the **extensive biological implications of minor genetic modifications,** was first reported in a study published in July 2023, with a follow-up study appearing in the February 2024 issue of Heredity.

The Drosophila family:

- The **Drosophila family** encompasses over **1,600 identified species,** showcasing a broad spectrum of natural diversity. Among these, researchers have discovered a unique case of **parthenogenesis,** a **type of reproduction where females produce offspring without male fertilization.**

- **Parthenogenesis** is a form of reproduction in which an egg can develop into an embryo without being fertilized by a sperm.

- Specifically, the **species Drosophila mangebeirai** consists **solely of females that can lay eggs developing directly into new female progeny without sperm.**

- Furthermore, **approximately 76%** of **Drosophila species,** typically **reproducing sexually,** have shown the **capability to hatch a minor fraction of eggs laid by isolated virgin females into larvae,** and an even smaller fraction of these can develop into adults.

- This occasional capability for **parthenogenesis** is termed **facultative parthenogenesis,** with **Drosophila mercatorum** being an example.

- However, **Drosophila melanogaster,** the **canonical species** extensively used in genetics research, **engages strictly in sexual reproduction,** highlighting the diverse reproductive strategies within the Drosophila family.

The genes for parthenogenesis:

- The research **aimed** to unveil the **genetic mechanisms enabling parthenogenesis** in **Drosophila mercatorum** and to replicate these conditions in **Drosophila melanogaster** to induce **parthenogenesis.**

- Through **RNA sequencing, 44 genes** were identified in **D. mercatorum eggs** that exhibited **differential expression** during **parthenogenetic development compared to their sexually reproducing counterparts.**

Engineering asexual reproduction:

- Researchers succeeded in **engineering asexual reproduction** in **Drosophila melanogaster** by **manipulating the expression levels of specific genes** identified in **Drosophila mercatorum,** a species that **can reproduce through parthenogenesis.**

- By adjusting the expression of **44 genes** to match those found in the **parthenogenetic eggs** of **D. mercatorum,** they achieved **parthenogenesis in D. melanogaster.**

- Specifically, introducing **two additional copies of the pologene**, an extra copy of the **Myc gene**, and **reducing the expression of the Desat2 gene** resulted in **1.4% of D. melanogaster eggs** developing parthenogenetically into adults.

- These **parthenogenetically born flies** were also **capable of mating with males and producing offspring,** thus converting a species that reproduces strictly sexually into one that can reproduce facultatively through parthenogenesis.

The polar bodies:

- In the process of **sexual reproduction in flies,** each offspring inherits **two sets of chromosomes,** one from each parent, but **only transmits one chromosome from each pair to its eggs or sperm.**

- Following **fertilization,** the egg contains **five sets of genomes:** one in the maternal pronucleus, one in the paternal pronucleus, and three additional sets in nuclei called **polar bodies** located at the egg's periphery.

- **Polar bodies,** normally a **by-product** of **chromosome segregation,** are typically discarded as the **male** and **female pronuclei fuse** to form the **progeny nucleus.**

- However, in **unfertilized eggs** lacking the **male pronucleus**, the **female pronucleusalone cannot initiate embryonic development.**

- Researchers discovered that modifying the protein levels of **polo, Myc,** and **Desat2** made the **sequestration** and **disposal of polar bodies inefficient,** allowing them to potentially substitute for the **absent male pronucleus and initiate embryonic development,** thus enabling **parthenogenesis.**

Significance:

- This finding has significant implications for **pest control strategies** that involve releasing **sterilized males or males** with **genetically edited genomes** to **suppress progeny numbers.**

- Such approaches may inadvertently select individuals capable of facultative **parthenogenesis,** thereby **reducing their long-term effectiveness**.

Topic 75. FIGHTING WARMING: WHEN GASSES ARE CONTRABAND

Important for the subject: Environment

A California man is facing criminal charges for smuggling greenhouse gasses (GHGs).

Greenhouse Gasses (GHGs):

- **Atmospheric gasses like carbon dioxide, methane, nitrous oxide (N2O), water vapor, and chlorofluorocarbons** are capable of trapping the out-going infrared radiation from the earth's surface thereby causing greenhouse effect.

- Hence these glasses are known as greenhouse gasses and the heating effect is known as greenhouse effect.

About Refrigerants:

- A refrigerant is a working fluid used in the refrigeration cycle of air conditioning systems and heat pumps where in most cases they undergo a repeated phase transition from a liquid to a gas and back again.

About HFCs:

- **Hydrofluorocarbon (HFC),** any of several organic compounds composed of hydrogen, fluorine, and carbon.

- HFCs are produced synthetically and are used **primarily as refrigerants.**

- They became widely used for this purpose beginning in the late 1980s, **with the introduction of the Montreal Protocol, which phased out the use of chemicals such as halons and chlorofluorocarbons (CFCs) that contribute to the depletion of Earth's ozone layer.**

About HCFC:

- HCFCs are compounds containing **carbon, hydrogen, chlorine and fluorine.**

- Industry and the scientific community view certain chemicals within this class of compounds as acceptable temporary alternatives to chlorofluorocarbons.

- **HCFC-141 b is one of the most powerful ozone-depleting chemical**s after Chlorofluorocarbons (CFCs).

- Nearly, **50 % of the consumption of ozone depleting chemicals in the country was attributable to HCFC-141 b in the foam sector.**

About Montreal Protocol:

- The **1987 Montreal Protocol on Substances that deplete the Ozone Laye**r and its succeeding amendments were subsequently negotiated to control the consumption and production of anthropogenic (ODSs) and some hydrofluorocarbons (HFCs).

- The Protocol was signed by **197 parties in 1987 to control the use of ozone-depleting substances, mainly chlorofluorocarbons (CFCs).**

- The Montreal Protocol mandated the **complete phase-out of CFCs and other ozone-depleting** substances (ODS), which it has successfully managed to do in the last three decades.

- **CFCs were gradually replaced, first by HCFCs, or hydrochlorofluorocarbons,** in some cases, and eventually by HFCs which have minimal impact on the ozone layer.

- The adoption of the 2016 Kigali Amendment to the Montreal Protocol will phase down the production and consumption of some HFCs and avoid much of the projected global increase and associated climate change.

- Under Kigali it was agreed to phase down the consumption of HFCs by 80% by 2047.

Topic 76. MINISTRY OF MINORITY AFFAIRS APPROVES 'CENTRE OF JAIN MANUSCRIPTOLOGY' (GUCJM) AT GUJARAT UNIVERSITY

Important for the subject: History

In the spirit of **'Virasat Se Vikas' and 'Virasat Se Samvardhan', The Ministry of Minority Affairs inspired by 'Panch Pran'** of Honorable Prime Minister, has approved the 'Centre of Jain Manuscriptology (GUCJM) at Gujarat University amounting to Rs. 40 Crore.

- Centre aims at academic support for development of **Apbhransh and Prakrit language of Jainism in the University under PMJVK scheme**

- Centre facilitates collaboration between the University and the Ministry to enhance educational opportunities for minority communities in India to carry out research in the field of Jain Studies.

- The initiative will promote education and research in the field of Jain Studies and empowerment of minority communities through education and research

About Pradhan Mantri Jan Vikas Karyakram (PMJVK) scheme:

- **Pradhan Mantri Jan Vikas Karyakram (PMJVK), a Centrally Sponsored Scheme (CSS).**

- The scheme functions under the **Ministry of Minority Affairs.**

- It is an area development programme under which **community infrastructure and basic amenities are being created in the identified areas.**

- The scheme is being implemented under the aegis of the **State Governments/ Union Territory (UT) Administrations** on a fund sharing pattern and the projects are implemented and managed by the concerned State/ UT Government.

- The scheme was restructured and implemented with effect from May, **2018 as Pradhan Mantri Jan Vikas Karyakram (PMJVK), so as to reduce gaps**, if any, in the socio-economic parameters in 1300 identified areas of the country

About Jain Minorities:

- This made the **Jain community, which makes for 9.5 million or 0.72 percent of the population as per 2011 census.**

- It is the sixth community to be designated this status as a "national minority", **after Muslims, Christians, Sikhs, Buddhists, and Parsis.**

About Apabhramsha language

- It is a **literary language of the final phase of the Middle Indo-Aryan languages.**

- When the **Prakrit languages were formalized by literary use, their variations came to be known as Apabhramsha.**

- Despite this close relationship, scholars generally treat Apabhramsha and the nonliterary Prakrits separately.

About Prakrit language:

- Prakrit is a group of **vernacular Middle Indo-Aryan languages** that were used in the Indian subcontinent from around the **3rd century BCE to the 8th century CE.**

- The term Prakrit is usually applied to the middle period of **Middle Indo-Aryan languages, excluding earlier inscriptions and Pali.**

Topic 77. SABARMATI ASHRAM REDEVELOPMENT PLAN

Important for the subject: History

The redeveloped 'Kochrab Ashram' inaugurated by Prime Minister Narendra Modi in Ahmedabad.

- **On March 12, marking the 94th anniversary of the Dandi March** that began from the Sabarmati Ashram, Prime Minister Narendra Modi performed the 'Ashram Bhoomi Vandana', a symbolic laying of the foundation stone, and unveiled the masterplan of the Rs 1,200 crore Gandhi Ashram Memorial and Precinct Development Project.

About Various Settlements:

- Gandhi set up five settlements during his lifetime — t**wo in South Africa (Phoenix Settlement in Natal, and Tolstoy Farm outside Johannesburg), where he lived from 1893 to 1914, and three in India, where he arrived in January 1915.**

Kocharab:

- Gandhiji set up the first ashram in **Ahmedabad in Kocharab in 1915.**

- **Gandhi's India ashram was originally established at the Kochrab Bungalow** of **Jivanlal Desai, a barrister,** and friend of Gandhi, on 25 May 1915. At that time the ashram was called the Satyagraha Ashram.

Sabarmati:

- In 1917, Gandhi founded the ashram at **Sabarmati — his fourth ashram — on the western bank of the Sabarmati River.**

- The location was to the north of the village of Juna Vadaj, beyond the **Chandrabhaga rivulet, a tributary of the Sabarmati.**

- He spent the most time here, and it was the cradle of eight major movements related to India's struggle for independence.

- Apart from the Dandi March that Gandhi began from here on March 12, 1930, **he also launched the Champaran Satyagraha (1917), the Ahmedabad mills strike and Kheda Satyagraha (1918), the Khadi movement (1918), the Rowlatt Act and Khilafat Movements (1919), and the Non-Cooperation movement (1920) while living in Sabarmati.**

Sewagram:

- Sevagram (meaning "A town for/of service") is a town in the state of **Maharashtra, India.**

- It was the place of Mahatma Gandhi's ashram and his residence from 1936 to his death in 1948.

- After **Sabarmati, Sevagram Ashram** holds immense importance due to the residence of Mahatma Gandhi.

History of Sabarmati:

- The Sabarmati ashram is sited between a prison and a crematorium, and Gandhi believed that a satyagrahi has invariably to go to either place.

- At the **ashram, Gandhi formed a tertiary schoo**l that focused on manual labor, agriculture, and literacy, in order to advance his efforts for the nation's self-sufficiency.

- It was also from here that on 12 March 1930, **Gandhi marched to Dandi, 241 miles** from the ashram, with 78 companions in protest at the British Salt Law, which increased the taxes on Indian salt in an effort to promote sales of British salt in India.

- This mass act of civil disobedience in turn led to the imprisoning of some 60,000 by the British Raj over the following three weeks.

Subsequently, the government seized the ashram.

- On 12 March 1930, **Gandhi vowed that he would not return to the ashram until India had gained** independence and Gandhi did not come back to Sabarmati ashram.

- Gandhi was assassinated on 30 January 1948.

Topic 78. GI TAG FOR MAJULI MASKS OF ASSAM: HISTORY, CULTURAL SIGNIFICANCE OF THE CENTURIES-OLD ART FORM

Important for the subject: History

The traditional Majuli masks in Assam were given a **Geographical Indication (GI) tag by the Centre on Monday (March 4).**

- Majuli manuscript painting also got the GI label.

- Majuli, the largest river island in the world and the seat of Assam's neo-Vaishnavite tradition, has been home to the art of mask-making since the 16th century.

- **What are Majuli masks?**

- The handmade masks are traditionally used to **depict characters in bhaonas, or theatrical performances with devotional messages under the neo-Vaishnavite tradition.**

- These were introduced by the 15th-16th century reformer **saint Srimanta Sankardeva.**

- The masks can depict gods, goddesses, demons, animals and birds — **Ravana, Garuda, Narasimha, Hanuman, Varaha Surpanakha all feature among the masks.**

- They can range in size from those covering just the face (mukh mukha), which take around five days to make, to those covering the whole head and body of the performer (cho mukha), which can take up to one-and-a-half months to make.

- The masks are made of **bamboo, clay, dung, cloth, cotton, wood** and other materials available in the riverine surroundings of their makers.

Why is the art practiced in monasteries?

- Sattras are monastic institutions established by Srimanta Sankardev and his disciples as centers of religious, social and cultural reform.

- Today, they are also centers of traditional performing arts such as **borgeet (songs), sattriya (dance) and bhaona (theater), which are an integral part of the Sankardev tradition.**

- Majuli has 22 sattras, and the patent application states that the mask-making tradition is by and large concentrated in four of them — Samaguri Sattra, Natun Samaguri Sattra, Bihimpur Sattra and Alengi Narasimha Sattra.

The makers of the masks

- The arts of dance, song and musical instruments are closely tied to the sattras and the one who began this was Assam's guru Srimanta Sankardev.

- In the 16th century, he established this art of masks through a play called Chinha Jatra.

- At that time, to attract ordinary people to Krishna bhakti, he had presented the play in his birthplace Batadrava.

- Samaguri Sattra had been practicing mask-making since its establishment in 1663.

What is Majuli manuscript painting, which also received the GI tag?

- It is a form of painting also originating in the 16th century and is done on sanchi pat, or manuscripts made of the bark of the sanchi or agar tree, using homemade ink.

- The earliest example of an illustrated manuscript is said to be a rendering of the Adya Dasama of the Bhagwat Purana in Assamese by Srimanta Sankardev.

- This art was patronized by the Ahom kings.

- It continues to be practiced in every satra in Majuli.

Topic 79. WHAT IS CUTTACK'S FAMED SILVER FILIGREE WORK, WHICH RECENTLY RECEIVED GI TAG

Important for the subject: History

The famous **Rupa Tarakasi, or silver filigree work of Odisha's Cuttack, has received the geographical indication (GI) tag.**

- The **Odisha State Cooperative Handicrafts Corporation Limited (Utkalika)** had applied for the tag.

- A GI tag is conferred upon products originating from a specific geographical region, signifying unique characteristics and qualities.

Rupa Tarakasi

- **Odisha's Cuttack** is known for its silver filigree work, of intricate design and fine craftsmanship. In Odia, "tara" means wire and "kasi" means to design.

- As part of **Rupa Tarakasi, silver bricks are transformed into thin fine wire**s or foils and used to create jewelry or showpieces.

- **In Cuttack the work is generally done by boys,** whose sensitive fingers, and keener sight enable them to put the fine silver threads together with the necessary rapidity and accuracy.

- The filigree work is quite distinct in character from the indigenous silver jewelry of the country.

Origin

- **While th**e exact origin of the filigree art in Cuttack is not clear, it is known to have existed as far back as the 12th century.

- The art form received considerable **patronage under the Mughals.** Over the years, as Cuttack transitioned through the hands of different rulers, the silver filigree took on a new form with each.

History

- The silver filigree work in which the people of Cuttack have attained such surprising skill and delicacy is identical in character with that of Arabia, Malta, Genoa, Norway, Sweden and Denmark, and with the filigree work of ancient Greece, Byzantium, and Etruria, and was probably carried into the West by the Phoenicians and Arabs, and into Scandinavia by the Normans and in the course also of the medieval trade between Turkestan and Russia.

Popular Product Categories:

- The iconic items found only in Cuttack are the Durga Puja Medha (silver decorations for the Durga idol and pandal), Odissi jewelry, religious/cultural pieces linked directly to the customs of Odisha, and the Dama chain.

Topic 80. MADHYA PRADESH HC ORDERS ASI SURVEY OF BHOJSHALA COMPLEX

Important for the subject: History

The Indore Bench of the Madhya Pradesh High Court on Monday directed the Archaeological Survey of India (ASI) to conduct a scientific survey of the **Bhojshala Temple-Kamal Maula Mosque complex situated in the State's Dhar district.**

- The site is an **ASI-protected, 11th Century CE monument.**

- Under an agreement with the ASI, puja is performed in the temple by Hindus every Tuesday and Namaz offered every Friday.

About Bhojshala:

- The **Bhojshala is an historic temple located in Dhar, Madhya Pradesh, India.**

- The name is derived from the celebrated king Bhoja of the **Paramāra dynasty of central India,** a patron of education and the arts, to whom major Sanskrit works on poetics, yoga and architecture are attributed.

- The architectural parts of the structure itself are of different periods but mainly date the **12th century**, with the Islamic tombs in the campus added between the 14th and 15th century.

- Bhojshala is presently a Monument of National Importance protected by the Archaeological Survey of India under the **Archaeological Sites and Remains Act, 1958**, otherwise known as the AMASR Act.

About King Bhoja:

Bhoja (1010–1055 CE) was an Indian king from the Paramara dynasty.

- His kingdom was centered around the Malwa region in central India, where his capital Dhara-nagara (modern Dhar) was located.

- Bhoja fought wars with nearly all his neighbors in attempts to extend his kingdom, with varying degrees of success.