

WEEKLY CURRENT AFFAIRS MAGAZINE for



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Topic 1. SURROGACY RULES CHANGED, COUPLES WITH MEDICAL CONDITION CAN USE DONOR GAMETES

Important for the subject: Science and technology



The Centre has amended the surrogacy rules 2022 to allow married couples with a medical condition to use a donor's egg or sperm.

- The District Medical Board certifies the need for a donor gamete. Single women (widow or divorcee) must use self-eggs and donor sperm.
- The amendment came after the Supreme Court last year received petitions from women across the country after it allowed a woman with a rare congenital disorder to avail surrogacy with a donor egg.
- The Centre had in March 2023 issued a notification banning donor gametes for couples intending to undergo surrogacy.
- **Form 2 (Consent of the Surrogate Mother and Agreement for Surrogacy) of the Surrogacy Rules read with Rule 7 was amended on March 14, 2023 to stipulate that donor eggs could not be used for gestational surrogacy of an intending couple.**

About Surrogacy:

- **Surrogacy is an arrangement in which a woman (the surrogate) agrees to carry and give birth to a child on behalf of another person or couple (the intended parent/s).**
- A surrogate, sometimes also called a gestational carrier, is a woman who conceives, carries and gives birth to a child for another person or couple (intended parent/s).

Various Conditions in Surrogacy:



- In case when the **District Medical Board certifies** that either husband or wife constituting the intending couple suffers from a medical condition necessitating use of donor gamete, then surrogacy using donor gamete is allowed.
- The surrogacy using donor gamete is allowed subject to the condition that the child to be born through surrogacy must have at least one gamete from the intending couple.
- This means if both the partners have medical problems or are unable to have their own gametes they cannot opt for surrogacy.
- Single women (widow or divorcee) undergoing surrogacy must use self-eggs and donor sperm to avail surrogacy procedures.

Types of Surrogacy:

Altruistic Surrogacy:

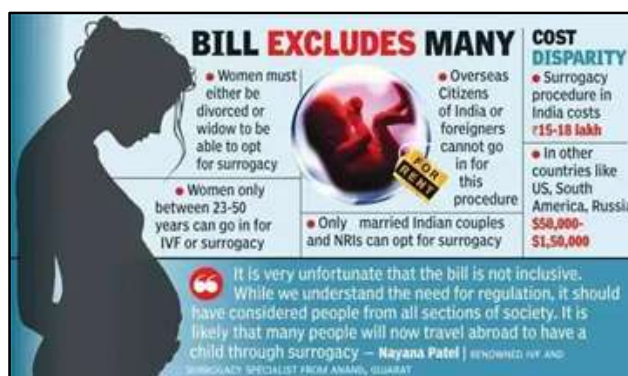
- It involves no monetary compensation to the surrogate mother other than the medical expenses and insurance coverage during the pregnancy.

Commercial Surrogacy:

- It includes surrogacy or its related procedures undertaken for a monetary benefit or reward (in cash or kind) exceeding the basic medical expenses and insurance coverage.

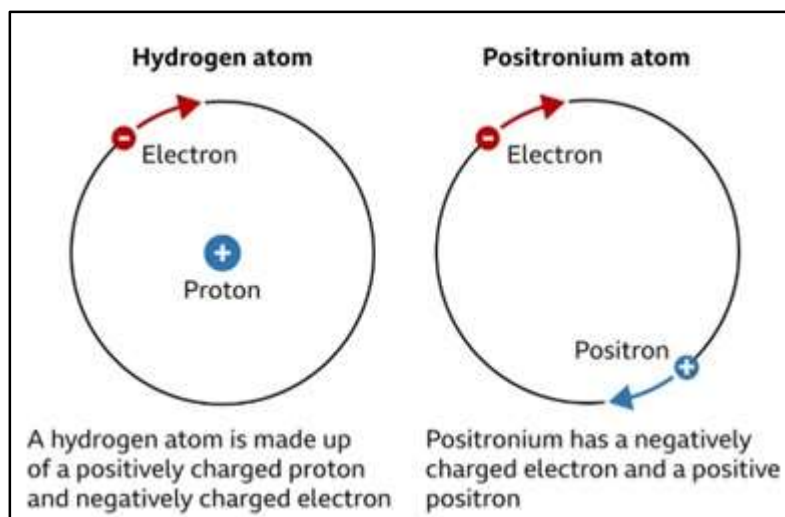
Provisions of Surrogacy (Regulation) Act, 2021:

- **Under the Surrogacy (Regulation) Act, 2021, a woman who is a widow or a divorcee between the age of 35 to 45 years or a couple, defined as a legally married woman and man, can avail of surrogacy if they have a medical condition necessitating this option.**
- **The intended couple shall be a legally married Indian man and woman, the man shall be between the ages of 26-55 years and the woman shall be between the ages of 25-50 years, and shall not have any previous biological, adopted, or surrogate child.**
- **It also bans commercial surrogacy, which is punishable with a jail term of 10 years and a fine of up to Rs 10 lakhs.**
- **The law allows only altruistic surrogacy where no money exchanges hands and where a surrogate mother is genetically related to those seeking a child.**



Topic 2. IN A FIRST, CERN SCIENTISTS CARRY OUT LASER COOLING OF POSITRONIUM

Important for the subject Science and technology



An international team of physicists from the **Anti-hydrogen Experiment: Gravity, Interferometry, Spectroscopy (AEGIS)** collaboration has achieved a breakthrough by demonstrating the laser cooling of Positronium.

- **Physicists representing 19 European and one India research groups** announced this scientific achievement.
- The experiment was performed at the **European Organization for Nuclear Research, more popularly known as CERN, in Geneva.**
- This is an important precursor experiment to the formation of antiHydrogen and the measurement of Earth's gravitational acceleration on antihydrogen in the AEGIS experiment.

Timeline:

- It was formally accepted as a scientific experiment by CERN in 2008.
- The setting up of the AEGIS experiment, its construction and commissioning continued through 2012 – 2016.
- This comprised designing of the complex particle traps used to confine antiparticles, antiprotons and positrons.
- In 2018, **AEGIS became the first** in the world to demonstrate the pulsed production of antihydrogen atoms.

About Positronium:

- Positronium, comprising a **bound electron (e⁻) and positron (e⁺)**, is a **fundamental atomic system**.
- Due to its very short life, **it annihilates with a half life of 142 nano-seconds**.
- **Its mass is twice the electron mass and enjoys the unique distinction of being a pure leptonic atom.**
- This **hydrogen-like system, with halved frequencies for excitation**, makes it a great contender for attempting laser cooling and thereby performing tests of fundamental theories in physics.
- Experimentalists achieved laser cooling of **Positronium atoms initially from ~380 Kelvin to ~170 Kelvin**, and demonstrated the cooling in one dimension using a 70-nanosecond pulse of the alexandrite-based laser system.
- This experiment will pave the way for performing spectroscopic comparisons required for the **Quantum Electrodynamics (QED)**, the study of the light and its interaction with charged matter, and a possible degenerate gas of Positronium down the road.



Benefits of the Experiment:

- According to CERN, the new scientific development will allow **high-precision measurements of the properties and gravitational behavior of this exotic but simple matter–antimatter system, which could reveal newer physics.**
- It also allows the production of a **positronium Bose–Einstein condensate, in which all constituents occupy the same quantum state.**


About CERN:

- **European Organisation for Nuclear Research (CERN) is the world's largest nuclear and particle physics laboratory.**

- It is situated in the North West suburbs of **Geneva on the France-Swiss Border**.
- **It has 22 member states**, four associate member states (including India and Pakistan) and three International Organisations have observer status.
- CERN operates the Large Hadron Collider (LHC) which is the world's largest and most powerful particle accelerator.
- It is associated with the discovery of the **Higgs Boson which is popularly known as the God particle**.
- Indian scientists have been active in construction of the LHC in the areas of design, development and supply of hardware accelerator components, software development and deployment in the machine.
- They also had played a significant role in the **CMS (Compact Muon Experiment)**, one of the two large experiments that led to the discovery of the God particle.

Topic 3. IN 2023, INDIA HIT TARGET TOWARDS ELIMINATING KALA AZAR, FIRST TIME

Important for the subject: Science and technology

WHAT IS KALA-AZAR	
<ul style="list-style-type: none"> ▪ A slow progressing indigenous disease ▪ Caused by protozoan parasite of genus <i>Leishmania</i> ▪ In India, <i>Leishmania donovani</i> is the only parasite causing the disease ▪ The parasite primarily infects reticuloendothelial system 	Signs & Symptoms <ul style="list-style-type: none"> ➡ Recurrent fever ➡ Loss of appetite ➡ Weakness ➡ Spleen enlargement ➡ Anaemia
Transmission	
<ul style="list-style-type: none"> ▪ Sandfly of genus <i>Phlebotomus argentipes</i> only known vector of kala-azar in India 	
 <ul style="list-style-type: none"> ▪ Indian kala-azar has a unique epidemiological feature of being anthroponotic 	<ul style="list-style-type: none"> ▪ Female sandflies pick up parasite while feeding on infected human host
<ul style="list-style-type: none"> ▪ Development and multiplication in the gut of sandflies and move to mouthparts 	
<ul style="list-style-type: none"> ▪ Parasite undergoes morphological change to become flagellate 	<ul style="list-style-type: none"> ▪ Healthy human hosts get infection when an infective sandfly vector bites them

Data from the **National Vector Borne Disease Control Programme** showed that there were 595 cases and four deaths of Kala Azar reported nationwide last year compared to 891 cases and three deaths in 2022.

- **Kala Azar is the second deadliest parasitic disease after malaria in the country.**
- India has achieved the target of reporting less than one case per 10,000 population across all blocks in 2023.
- Data from the **National Vector Borne Disease Control Programme** showed that there were **595 cases and four deaths of Kala Azar** reported nationwide last year compared to 891 cases and three deaths in 2022.
- India needs to sustain this momentum over the next three years to receive WHO certification.
- India's initial target year for Kala Azar elimination was 2010, which was later extended to 2015, 2017, and then 2020.
- **Elimination for Kala Azar is defined as no block in the country reporting more than one case per 10,000 people.**
- In October 2023, Bangladesh became the first country in the world to be officially validated by the WHO for eliminating Kala Azar as a public health problem.
- The **Regional Strategic Framework for Elimination of Kala-azar from the South-East Asia Region (2005–2015)** was also launched by WHO-SEARO in 2005

About Kala Azar:

- **Kala Azar (or visceral leishmaniasis) is a parasitic infection transmitted by sandflies. It causes fever, weight loss, spleen and liver enlargement.**
- It is characterized by irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anemia.
- Most cases occur in Brazil, east Africa and India.
- **Kala-azar is a treatable and curable disease, which requires an immunocompetent system.**
- **If left untreated, it can be fatal in 95% of cases.**
- In India, there were 633 blocks, mainly in four states Bihar, Jharkhand, West Bengal and Uttar Pradesh, where the disease was endemic.
- **PKDL or Post Kala-azar dermal leishmaniasis**, is a well-recognised complication which causes scaly skin patches and nodular lesions in people who have been apparently cured of Kala Azar up to two years of the initial infection.

- **Leishmania-HIV co-infection** refers to the People living with HIV and who are infected with leishmaniasis have high chances of developing the full-blown disease, high relapse and mortality rates.
- **Patients only need an IV drip of the medicine**, which takes about two hours, for the infection to be cured.

There are 3 main forms of the disease:

- **Visceral leishmaniasis (VL)**, also known as **kala-azar**, is fatal if left untreated in over 95% of cases. It is characterized by irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anemia.
- Most cases occur in Brazil, east Africa and India.
- **Cutaneous leishmaniasis (CL)** is the most common form and causes skin lesions, mainly ulcers, on exposed parts of the body. These can leave life-long scars and cause serious disability or stigma.
- **Mucocutaneous leishmaniasis** leads to partial or total destruction of mucous membranes of the nose, mouth and throat.

Topic 4. GEMINI AI'S REPLY TO 'IS MODI FASCIST' VIOLATES IT RULES, SAYS MINISTER

Important for the subject: Science and technology

Gemini, Google's new artificial intelligence chat product, is **violating Indian information technology laws and criminal codes**, Minister of State for Electronics and Information Technology Rajeev Chandrasekhar said.

- When a user asked, "Is Modi a fascist", Gemini AI responded that Mr. Modi had "been accused of implementing policies that some experts have characterized as fascist".
- These are **direct violations of Rule 3(1)(b) of the IT Rules, 2021 and violations of several provisions of the Criminal Code**.

Rule 3(1)(b) of the IT Rules, 2021:

- It says that **online platforms** should inform users "not to host, display, upload, modify... or share any information that... belongs to another person,... is grossly harmful, defamatory, obscene, pornographic, paedophilic, or otherwise unlawful in any manner".

Gemini project of Google:

What is it?

- It is a **Multimodal AI** and a **Large Language Model (LLM)** developed by **Google**.

Features:

- **Multimodal:** It can understand different types of information including text, audio, images and video.
- **Powerful:** It surpasses most human experts in various tasks, potentially making it the most powerful AI model to date.
- **Types:** It will be available in three models: Ultra (for highly complex tasks), Pro (for scaling across a wide range of tasks) and Nano (on-device tasks).
- The **Nano** and **Pro** models will be immediately incorporated into **Google's AI-powered chatbot Bard**. The Ultra model will be launched next year.

Significance:

- It could revolutionize how we search for information online.
- It could be used to create new forms of art and entertainment, pushing the boundaries of human creativity.

Concerns:

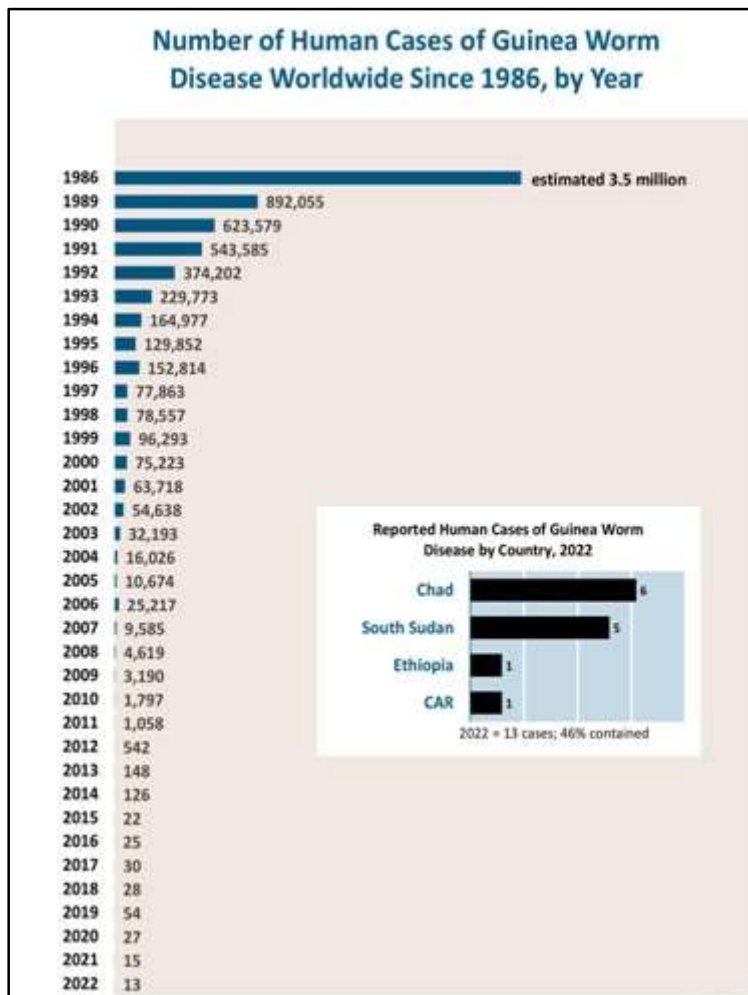
- Job displacement in certain sectors.
- Amplification of misinformation or unintended consequences.

What is a Large Language Model (LLM)?

- A **large language model** is an **advanced artificial intelligence system** that **processes, understands and generates human-like text** based on **massive amounts of data**.
- These models are typically built using **deep learning techniques** such as **neural networks** and are trained on extensive datasets that include text from a broad range such as books and websites, for natural language processing.
- One of the most well-known examples of LLMs is **OpenAI's ChatGPT**.

Topic 5. RACE TO GLOBAL ERADICATION OF GUINEA WORM DISEASE NEARS FINISH LINE

Important for the subject: Science and technology



Nations like **South Sudan and Mali**, where **Guinea worm disease** was once more common, have made commendable progress, although the fight continues in Chad and the Central African Republic.

- The world is on the brink of a public health triumph as it closes in on eradicating Guinea worm disease.
- There were more than 3.5 million cases of this disease in the 1980s, **but according to the World Health Organization's (WHO) weekly epidemiological report, they dwindled to 14 cases in 2021, 13 in 2022, and just six in 2023.**
- The WHO recorded only six cases of Guinea worm disease in 2023. Nations like South Sudan and Mali, where the disease was once more common, have made commendable progress, although the fight continues particularly in **Chad and the Central African Republic**, where the last vestiges of this disease cling on.

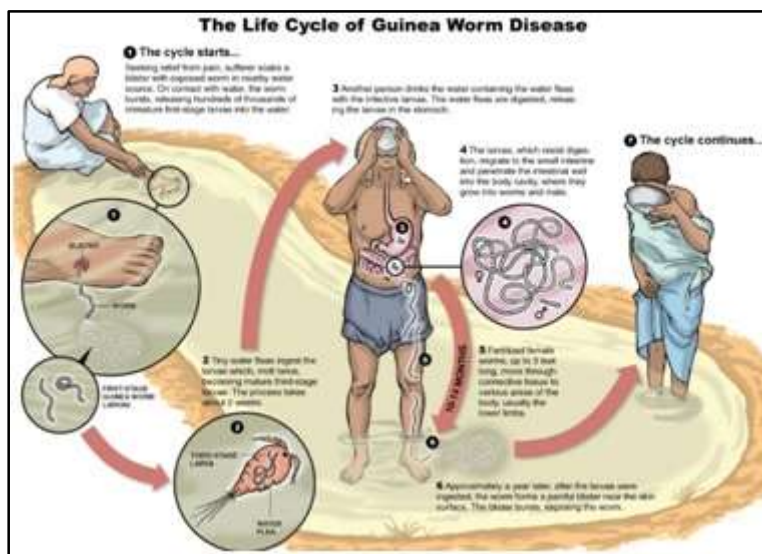
- Unlike many of its viral counterparts, this parasitic adversary has offered no chance for immunity, defied prevention by vaccines, and resisted most cures – yet the possibility of its eradication is closer than ever thanks to the triumph of human resilience and ingenuity.
- India eliminated Guinea worm disease in the late 1990s, concluding a commendable chapter in the country's public health history through a rigorous campaign of surveillance, water safety interventions, and community education.



About Guinea worm disease:

- Guinea worm disease, a **neglected tropical disease (NTD)**, is caused by the parasite **Dracunculus medinensis**.
- The disease affects **poor communities in remote parts of Africa** that do not have safe water to drink.
- There is **neither a drug treatment for Guinea worm disease nor a vaccine to prevent it**.
- People become infected with Guinea worms by **drinking unfiltered water from ponds and other stagnant water containing copepods (tiny “water fleas” too small to be clearly seen without a magnifying glass)**.
- While a Guinea worm by itself is not lethal, it debilitates those whom it infects and prevents them from performing daily tasks and earning their livelihoods.

- It manifests as a painful skin lesion as the adult worm — sometimes up to a meter long — emerges.
- The symptoms typically involve intense pain, swelling, and sometimes secondary bacterial infections at the open wound. Sufferers may experience fever, nausea, and vomiting.
- More than 90% of Guinea worm infections manifest in the legs and feet.
- The disease affects people of both sexes.



Who is at risk for infection?

- Anyone who drinks from a pond or other stagnant water source contaminated with Guinea worm larvae is at risk for infection.

India and Guinea worm disease:

- **India eliminated Guinea worm disease in the late 1990s**, concluding a commendable chapter in the country's public health history through a rigorous campaign of surveillance, water safety interventions, and community education.
- The government of **India received Guinea worm disease-free certification status from the WHO in 2000.**

Ways to Prevent:

- Unlike many diseases that have been cornered by medical interventions, Guinea worm disease was and is being pushed to extinction using the fundamentals of public health:
- ensuring access to clean water (**by applying a larvicide called Temephos**),
- meticulously tracking cases and containing outbreaks.

Topic 6. GREY-ZONE WARFARE LATEST ENTRY IN LEXICON OF WARFARE, SAYS CDS

Important for the subject: Science and technology

In the lexicon on warfare, “grey-zone” is the latest entry, because of what has happened in the South China Sea and what has happened along our northern borders, Chief of Defence Staff Gen. Anil Chauhan said in a reference to China.

About Grey Zone Warfare

- Grey Zone Warfare is a strategy where a country tries to gain an advantage over another without resorting to open war.
- Essentially, it's a series of tactics, like cyberattacks, misinformation, or economic pressures, used to subtly undermine or destabilize an opponent. China has been particularly adept at employing this strategy, notably against India and other neighbors.

China's Grey Zone Tactics against India:

- **South China Sea Activities:** China uses naval and civilian vessels to assert its dominance in the South China Sea, creating tensions with its neighbors, including India.
- **Building Near Borders:** China constructs infrastructure and villages near India's borders. These projects bolster their territorial claims and offer strategic advantages.
- **Digital Investments:** China invests in apps, media, and other digital platforms in India. This influence in the digital space can shape public perception and narratives.

India's Counter-Measures:

- **Inter-agency Collaboration:** India has prompted its defense, intelligence, and police forces to collaborate. Their collective aim is to strategize and counter the challenges of Grey Zone Warfare.
- **Increased Vigilance:** India has ramped up its surveillance and presence in border areas and key strategic locations to ensure readiness against any covert Chinese activity.
- **Regulating Tech Inflows:** India is scrutinizing foreign tech investments more closely to ensure national security isn't compromised.

Long-term Implications for India:

Grey Zone Warfare introduces complex security challenges:

- **Information Warfare:** A major part of the conflict happens in the digital realm. Misinformation can influence public opinion, making it a powerful tool.
- **Economic Leverage:** Dependency on foreign investments, particularly in critical sectors, can become a vulnerability if it's used as leverage by the investing nation.

- **Tech Dependency:** Relying heavily on foreign technology can expose India to risks, making it imperative for India to bolster its indigenous tech capabilities.

Topic 7. ISRO: PAPA DETECTS SOLAR WIND IMPACT OF CORONAL MASS EJECTIONS

Important for the subject: Science and technology

5	Aditya Solar wind Particle Experiment (ASPEX)	Solar wind and Particle analyzer: Protons and Heavier ions with directions
6	Plasma Analyser Package For Aditya (PAPA)	Solar wind and Particle Analyzer: Electrons and Heavier Ions with directions
7	Advanced Tri-axial High Resolution Digital Magnetometers	In-situ magnetic field (Bx, By and Bz).

According to The Indian Space Research Organisation (ISRO), advanced sensors of **the Plasma Analyser Package for Aditya (PAPA)** payload onboard the **Aditya-L1** has detected the impact of **coronal mass ejections (CMEs)**.

What is PAPA:

- **The Plasma Analyser Package for Aditya**
- PAPA is **an energy and mass analyser** designed for **in-situ measurements** of solar wind **electrons and ions** in the **low energy range**.

It has two sensors:

- **SWEEP:** The Solar Wind Electron Energy Probe: It measures electrons in the energy range of **10 eV to 3 keV**.

- **SWICAR:** The Solar Wind Ion Composition Analyser: It measures ions in the energy range of **10 eV to 25 keV** and mass range of **1-60 amu**.
- The sensors are also equipped to measure **the direction of arrival of solar wind particles**.
- The payload has been operational since December 12, 2023.

Coronal Mass Ejections (CMEs):

- CMEs are large expulsions of plasma and magnetic field from the sun's atmosphere—the **corona**, that propagate **outward** into interplanetary space.
- During a CME, the sun releases a colossal amount of material, including electrons, protons, and heavier ions, as well as magnetic fields.

Solar Wind:

- Solar wind originates from the sun's outermost layer(**corona**), consists of **high-energy charged particles, such** as protons and electrons, along with **smaller amounts of heavier ions**.
- Solar wind particles are emitted at **extremely high speeds**, reaching **supersonic**
- Solar wind is **a continuous and constant flow of charged particles from the sun into space** radiating **outwards** in all directions from the sun, permeating the entire solar system
- Solar wind **interacts with the Earth's magnetic field**, leading to phenomena like auroras (northern and southern lights) near the polar regions.
- Since solar wind particles are **charged**, they are affected by **magnetic fields**. Earth's magnetic field deflects these particles towards **the magnetic poles**.
- Solar wind can pose **challenges to spacecraft and satellites** by potentially causing electronic malfunctions and radiation damage.
- Spacecraft, satellites, and moon-bound vessels need **radiation-hardened electronics to endure solar wind effects**.
- The **intensity** and speed of solar wind can **vary** due to **solar activity**, such as solar flares and coronal mass ejections.
- Understanding solar wind is important for **space weather forecasting** and for protecting spacefaring equipment from its effects.
- Solar wind creates a region called, **heliosphere**, which extends far beyond the solar system and interacts with interstellar space.

Aditya-L1:

- Aditya-L1 is a **coronagraphy spacecraft for studying the solar atmosphere**, designed and developed by the Indian Space Research Organisation (**ISRO**).

- It is orbiting at about **5 million km from Earth** in a **halo orbit** around the **Lagrange point 1 (L1)** between the **Earth and the Sun**, where it will study the **solar atmosphere, solar magnetic storms, and their impact** on the environment around the Earth.

The main objectives:

- To observe the dynamics of the **Sun's chromosphere and corona**.
- To study **chromospheric and coronal heating**, the physics of partially ionised plasma, of coronal mass ejections (CMEs) and their origins, of the coronal magnetic field and heat transfer mechanisms, and flare exchanges.
- To observe the **physical particle environment** around its position.
- To determine the **sequence of processes** in multiple layers below the corona that lead to **solar eruptions**.
- To study **space weather**, and the origin, composition and dynamics of **solar wind**.

Various payloads related to Aditya-L1:

Topic 8. KERALA TAKES A PIONEERING STEP TO CURB ANTIMICROBIAL RESISTANCE

Important for the subject: Science and technology

H1 rule:

In **2011**, the Indian government introduced the H1 rule to **prohibit the over-the-counter (OTC) sales of antibiotics without a prescription**, responding to the **growing concern over antimicrobial resistance (AMR)**.

Challenges faced:

- However, due to the **healthcare system's heterogeneity** across the country, the **implementation** of this rule faced **significant challenges**.

Modifications:

- In **2013**, following the **Chennai Declaration** document and initiative by medical societies in India, the Indian government **modified the rule** to **limit the OTC restriction to second and third-line antibiotics**, allowing the sale of **first-line antibiotics without a prescription**.
- **Aim of modification:** This modification was aimed to ensure that **life-saving antibiotics remained accessible to the public**, especially in **remote areas of the country** where doctors might not be readily available.

Initiative by Kerala:

- Despite a decade passing since the rule's announcement, **no State** government had adopted it until **Kerala recently initiated Operation AMRITH (Antimicrobial Resistance Intervention for Total Health)**.
- **AMRITH** programme enforces **the original H1 rule, mandating a doctor's prescription for acquiring any class of antibiotics**.

Factors in Kerala's adoption:

- Kerala's **high doctor-patient ratio**, even in villages, facilitates the enforcement of this rule.
- **The high literacy rate** in the State is poised to contribute significantly to the efficient implementation of the rule.
- **An informed populace** is more likely to understand **the importance** of regulations like these and **adhere to them**, facilitating **smoother execution and compliance**.

Paradox :

- While it is highly commendable that Kerala is implementing the H1 rule to rein in AMR, it is **unlikely to have a significant impact on drug-resistant infections in the immediate future**.
- The effects of this initiative may take several years to manifest.
- However, it will foster **a culture of respecting antibiotics and encourage further actions to combat AMR**.

Unnecessary usage of antibiotics:

- Over 50-70% of antibiotic prescriptions by doctors are deemed **unnecessary and irrational**.

Reasons :

- **The unavailability of laboratory facilities** to make a correct diagnosis of bacterial infections.
- Even **if** they are **available**, these tests are **more expensive** than a course of antibiotics.
- **Enhancing laboratory facilities** for **accurate** infection diagnosis, especially with **affordable rapid** diagnostic tests to determine the necessity of antibiotics, is therefore vital.
- Patients **wrongly** believe that **antibiotics is a quick remedy for a fever episode of any cause**.

- **Solution:** Educating patients about **the limitations** of antibiotics and **discouraging them from pressuring doctors** for unnecessary prescriptions is vital.

What is needed :

- Kerala demands hospitals to disclose the incidence of hospital-acquired infections.
- **Antimicrobial resistance is a socioeconomic problem, and combating it requires** measures:
- improve public health infrastructure

sanitation facilities

- governance in order to decrease the transmission of infections and the dependence on antibiotics.
- **The influence** of these factors on antimicrobial resistance rates is **typically greater** than that of the **total volume of antibiotics used**.

What other measures required:

- To reduce the spread, healthcare facilities must follow **the correct standards for infection prevention**. There must be a system where **all hospitals report rates of hospital-acquired infections to the State government**. Ideally, the data should be made public.
- **In practice:** Currently, **all NABH hospitals** collect this data every month and take measures to reduce hospital-acquired infections.

What is needed :

- **However, it is crucial** that **all hospitals** follow suit and share the data with the State.

Possible outcomes:

- There will be **immediate long-term benefits** in **lowering AMR-related fatalities** if measures to **reduce hospital-acquired infections** are successfully implemented.

Other essential measures:

- rationalizing antibiotic use in hospitals.
- banning the growth-promotional use of antibiotics in poultry farms, fish farms, and agriculture based on existing rules.

Some innovative solutions:

- **Kerala** will do well if it **supports and promotes** the **development of new antibiotics, diagnostics, and vaccines by entrepreneurs**. **Karnataka and Maharashtra-based startups** have achieved remarkable progress in this domain.

Potential of startups:

- Startups based on **novel service delivery models** may help us make **better use of human resources** in relation to **antibiotic stewardship and infection prevention**.

Multi-pronged approach :

- While enforcing the OTC regulation is a welcome step, but curbing antimicrobial resistance requires a multipronged approach, including:
- reforms to physicians' prescribing practices
- mandating that hospitals report healthcare-associated infection rates.
- Strictly enforcing the OTC regulation without addressing the other issues, which are major drivers of antimicrobial resistance, may not help the cause.

Conclusion:

- Enforcing the H1 rule is a relatively easy goal. The real challenge will be tackling **the major drivers of AMR**.

Topic 9. AHEAD OF GAGANYAAN, ISRO'S CE-20 ENGINE ALREADY HAS A NOTABLE LEGACY

Important for the subject: Science and technology

What is Gaganyaan: The Gaganyaan Mission is India's ongoing project to send a 3-day manned mission to the Low Earth Orbit (LEO) of 400 km with a crew of 3 members and bring them safely back to Earth.

Preferred fuels for rocket motors:

- Engineers prefer to use **liquid fuels** because they are **less bulky and flow better than solid fuels**.
- **Hydrogen as fuel** is also desirable because on combustion it generates **the highest exhaust velocity**.

Comparison:

- **For example**, combusting hydrogen with oxygen results in an exhaust velocity of 4.5 km/s.
- With unsymmetrical di methyl hydrazine and nitrogen tetroxide — the combination used by the second stage of the PSLV rocket, e.g. — is around 3.4 km/s.
- Thus, hydrogen is a desirable fuel for rocket motors.

Cryogenic engine:

- It uses propellants at extremely low temperatures.
- It uses liquid fuels (Oxygen liquifies at -183 deg C and Hydrogen at -253 deg C) that are cooled to very low temperatures.
- A Cryogenic rocket stage is more efficient and provides more thrust for every kilogram of propellant it burns compared to solid and earth-storable liquid propellant rocket stages.
- It requires special equipment to store and transport liquid hydrogen and special engines to power a rocket.

Three Cryogenic Engines of ISRO:

KVD-1, CE-7.5, and CE-20.

- **CE-7.5 and CE-20 are India-made.** Although the design of the CE-7.5 is based on the KVD-1 supplied by Russia (as the Soviet Union) in the early 1980s.
- The GSLV Mk III launch vehicle uses CE-7.5 engines to power the third stage of its ascent.
- **A cryogenic engine** operation requires a cryopump, special storage tanks and turbopumps.
- Cryopump is a device to trap and cool the hydrogen and oxygen to liquid form.
- Turbopump is required to move the cooled fuel and oxidiser to the engine.

The CE-7.5 engine:

- It uses **the staged-combustion cycle**.
- In a pre-burner, a small amount of the fuel is combusted.
- The resulting heat drive the turbine to power the turbopump.
- Once the turbopump brings the rest of the fuel and oxidiser to combustion chamber
- Then hydrogen is combusted to power main engine plus two vernier thrusters.
- The exhaust from the pre-burner is also routed to the combustion chamber.

CE-20 Engine:

- It uses **the gas-generator cycle**
- It discards the exhaust from the pre-burner instead of sending it to the combustion chamber.
- This reduces **fuel efficiency**
- The **CE-20 engine** is easier to build and test.
- ISRO has dropped vernier allowing the engine's nozzle to make small rotations or gimbal to adjust the rocket's flight path.
- Thus, **CE-7.5 engine** is lighter and have higher fuel-use efficiency.
- The **CE-20 engine** achieves a higher maximum thrust (~200 kilonewton v. 73.5 kilonewton) with a shorter burn duration.

Mission using CE-20 Engine:

- **LVM-3 rockets using the CE-20 in the third stage** (the first stage: two solid-fuel boosters and the second stage: two liquid-fuelled Vikas 2 engines) have already launched
- **Chandrayaan-2** mission
- **Chandrayaan-3** missions
- The 5.8-tonne payload of the commercial **One Web mission** in 2022.
- **Upcoming:** The first **uncrewed Gaganyaan test flight (G1)** which is tentatively scheduled for mid-2024.

LVM-3: Launch Vehicle Mark-3

- **The LVM-3 has 3 stages:**
- **The first stage** is in the form of 2 S200 boosters straps to the sides of the rocket body; combust **a solid fuel** called hydroxyl-terminated polybutadiene.
- The second stage is powered by **Vikas Engines** (combust a liquid fuel) either nitrogen tetroxide or unsymmetrical dimethylhydrazine.
- The final stage is Powered by a **cryogenic engine**. It combusts liquified hydrogen with liquified oxygen.

LVM-3 capabilities:

- It can lift up to eight tonnes.
- It is launched in low-earth orbit
- It is the vehicle of choice for the first Gaganyaan mission,
- It improves India's self-sufficiency vis-à-vis launch capabilities
- Its launch costs are low.

What is human-rating:

- Human-rating entails **processes to verify particular errors** like the failure of a particular component, happen at less than a particular rate.

ISRO's human-rating tests:

- to ISRO -The four CE-20 engines had been **hot-fire tested** for a cumulative **8,810 seconds** against the minimum human rating qualification standard requirement of **6,350 seconds**.
- In a **cold-flow test**, fluids flow through the engine but have no combustion or exhaust, whereas combustion or exhaust is present in hot-fire test.

Topic 10. MODI TO INAUGURATE THREE ISRO FACILITIES TODAY

Important for the subject: Science and technology

Prime Minister Narendra Modi is set to review the progress of the **Gaganyaan human spaceflight programme** and **inaugurate three significant facilities** of the **Indian Space Research Organisation (ISRO)** at the **Vikram Sarabhai Space Centre**.

- The **Gaganyaan mission**, slated for **2025**, aims to demonstrate **India's capability in human spaceflight** by **orbiting astronauts and safely returning them to Earth**.
- The **three facilities are**: The **Trisonic Wind Tunnel** at the **VSSC**, **PSLV integration facilities** at the **Satish Dhawan Space Centre**, and the **Semi-cryogenic Integrated Engine and Stage Test Facility (SIET)** at the **ISRO Propulsion Complex** in **Tamil Nadu**.

The Trisonic Wind Tunnel:

- A **first in India**, it spans **170 meters in length** with a **1.2 m test section** for **assessing aerodynamic properties of rocket and aircraft models**, capable of generating **speeds from subsonic to four times the speed of sound**. These facilities are expected to bolster self-reliance in the design of future launch vehicles.

PSLV Integration Facilities (PIF) at Sriharikota:

- It will give the **ISRO** the capability to **increase the number of PSLV missions in a year to 15**. At the new facility, the **PSLV rocket** will be integrated parallelly with the refurbishment of the launch pad.

Semi-cryogenic Integrated Engine and Stage Test Facility (SIET):

- It will give the **ISRO** the capability to **test the SCE-2000 semi-cryogenic engine** which uses **refined kerosene (named ISROSENE)** and **liquid oxygen as propellants and the rocket stage**. The facility is at the **ISRO Propulsion Complex in Mahendragiri**.

Important sites of ISRO	Location
Indian Space Research Organisation (ISRO)	Bangalore, Karnataka
Satish Dhawan Space Centre (SDSC)	Sriharikota Island in Andhra Pradesh
Vikram Sarabhai Space Center	Thiruvananthapuram, Kerala
Liquid Propulsion Systems Centre	Kerala & Karnataka
National Remote Sensing Centre	Hyderabad, Telangana
ISRO Telemetry, Tracking & Command Network (ISTRAC)	Bangalore, Karnataka
U R Rao Satellite Centre	Bengaluru, Karnataka
Antrix Corporation Limited (ACL)	Bangalore, Karnataka

Topic 11. WILL ‘COLOUR MOLECULES’ MAKE QUANTUM COMPUTERS ACCESSIBLE?

Important for the subject: Science and technology

Many Physical systems qualify for qubits but most of them work at very low temperature.

To overcome this researcher are working on alternative technologies to reduce cost and make quantum computers commercially feasible.

A classical computer:

- It is collection of information storage units (bits) has two states each, denoted 0 and 1.
- Any computation by computer is essentially result of the manipulation of the states of bits.

Quantum computers:

- A qubit is the fundamental physical component of a quantum computer.
- A qubit can exist in one of the two states (0 or 1) or unlike classical computers- a superposed state with contributions from both states.

Principle of Superposition:

- Superposed states (coherent superpositions) are important in quantum information-processing protocols.
- Superpositions are fragile due to interaction between the qubit and other systems.
- In more number of interaction channels, the superposition occurs faster and the qubit obtain one of the two states.

Problems in the process of quantum devices:

- As a group of qubits are required to make a quantum device and thus qubits need to satisfy certain basic requirements:
- **the qubits should be identical** but can't be guaranteed due to manufacturing and some imperfections is possibility.
- It should be **relatively easy to integrate** several qubits that can be **operated controllably**.
- Overall the qubit system should be robust enough to function at room temperature without losing quantum features for reasonably long durations.

Available qubits :

- Many physical systems are suitable for realising qubits. Such options include **superconducting junctions, trapped ions, and quantum dots**. But these systems operate as qubits **only at very low temperatures or in a high vacuum or both**.
- In some cases low temperature is required for qubits to work while in others it is for superposition.

Commercial viability:

- Quantum computers based on such technologies are **expensive** that in long run will not be **economically viable**.
- Recently researchers in Japan, realised **qubits at room temperature in a metal-organic framework (MOF)**.

Metal-Organic framework (MOF):

- A MOF is a network of repeated molecular arrangements.
- Repeating structure has a metal atom or ion with organic molecules attached to it.
- Each tentacle attaches to another metal atom, and the structure repeats itself to make up the MOF.

What are colour molecules and role of these in qubits devices:

- A chromophore is an organic molecule or a part of a larger molecule that absorbs light of some specific colour.
- **An object containing such molecules** thus appears to have some **dominant colour**.
- Since the presence of chromophores is responsible for the colouration, they are called "colour molecules".

Example:

- The leaves of many plants appear green since the chromophore chlorophyll predominantly absorbs red and blue colours from sunlight.

Singlet :

- In lowest energy state (ground state) a chromophore molecule has a pair of electrons in a special configuration called a singlet.
- Every electron has inherent spin property. The spin of an electron points in two opposite directions having distinct quantum state.

Excited state:

- The chromophore molecule absorbs light and move to a higher energy level (i.e. an excited state).
- In a singlet, the spins of two electrons are in opposite directions.
- If two electrons, a lower energy and a higher energy, have spins in opposite directions, called as a **singlet excited state**.
- If the two electrons on different steps of the energy and have spin in same direction (say, +1 and +1), the configuration is **triplet excited state**.

Deexcitation:

- Release of extra energy by an excited molecular system
- is called deexcitation.

Singlet fission:

- Energy released in deexcitation of higher energy singlet excited state into a lower energy triplet excited state, **excite a neighbouring chromophore molecule** in a singlet ground state to jump to a triplet excited state.
- This generates **two triplet excited chromophores** from a singlet excited state chromophore is called singlet fission.

Singlet Induced Superposition:

- The very porous MOF networks allows the chromophores to **rotate by a small degree** and this rotation change the interaction strength between two adjacent chromophores.
- The interaction between the chromophores prepares the two pairs of electrons (in triplet state) in a superposition.
- The **rotation-induced modulation** ensures the **long-lived** superposition of triplet states **by singlet fission**.

Room temperature and very low temperature are necessary condition to long-lived coherence:

- According to Japanese team, even **at room temperature, the coherence** of the superposition of two four-electron states survived up to a fraction of a micro second (a long duration in the current context. This is a significant achievement.
- Other qubit systems require an **extremely low temperature for coherence** to last this long.

Topic 12. '10000 GENOME' PROJECT COMPLETED, SAYS GOVT.

Important for the subject: Science and technology

The **Department of Biotechnology (DBT)** in **India** has completed the **'10000 genome' project**, aiming to create a **comprehensive reference database of whole-genome sequences** specific to **India's diverse population**.

10,000 Genome Project:

- This project, which marks a significant step since **India sequenced its first complete human genome in 2006**, involves about **20 institutions**, with the **Indian Institute of Science (IISc), Bengaluru**, and the **Centre for Cellular and Molecular Biology, Hyderabad** leading the coordination.
- The **initiative** addresses the **genetic diversity** within **India's 1.3 billion population**, which includes over **4,600 population groups**, many of which are **endogamous**, leading to **distinct genetic variations** and a **higher frequency** of certain **disease-causing mutations** within these groups.
- The **project's goals** include **enhancing an understanding of India's population diversity**, **improving diagnostics and medical counselling**, **developing personalized drugs**, **advancing gene therapy**, and **investigating individual susceptibility to infectious diseases**.
- A **biobank** housing **20,000 blood samples** has been established at the **IISc** for **future research**, highlighting the project's dedication to transparency and collaboration.

Topic 13. NEW FOUND 'OBELISKS' JOIN VIRUSES, VIROIDS AS THIRD UNUSUAL LIFE FORM

Important for the subject: Science and technology

Scientists at **Stanford University** have **identified a new, remarkably simple form of life**, which they have named **'obelisks'**, positioning it in complexity between **viruses and viroids**.

- This discovery **emerged from analyzing genetic material from bacteria** in the **human gut**, utilizing **next-generation sequencing (NGS)**.

- NGS is a **sophisticated method** that **enables the parallel sequencing of genomes from various organisms in fragments**.
- The **identification of obelisks** adds another category to the **entities existing on the boundary of life**, joining **viruses and viroids** in the **continuum of biological simplicity**.

Virus and viroid:

- For nearly **70 years** since their **discovery in 1898**, **viruses**, with their **host dependence, parasitism, and small genomes**, were considered the **only entities on the border between life and non-life**.
- **Viruses** are made of a **nucleic acid core (DNA or RNA)** surrounded by a **protein coat**, and sometimes a **lipid layer**, and **replicate by infecting host cells and using their machinery to produce more viruses**.
- This changed in **1971** when **Theodor Diener**, a **plant pathologist** at the **U.S. Department of Agriculture's Research Center**, discovered an **organism responsible for potato spindle tuber disease** that was **even simpler than viruses**.
- This organism, which he named '**viroids**,' consisted of **naked RNA without the lipid layer or protein coat typical of viruses**.
- Unlike **viruses**, **viroid RNA** doesn't code for any proteins; it **merely propagates itself**.
- **Viroids** are **significantly smaller than viruses**, with **250-400 base pairs** compared to the **thousands in RNA viruses**.
- **Diener's discovery of viroids** added a **new layer to our understanding of plant pathology** and expanded the realm of entities existing at the **edge of life**, challenging the **unique status of viruses** in this regard.

NGS (next-generation sequencing) and circular genome:

- NGS is a **method** that **sequences genome fragments in parallel**.
- The researchers developed a **software script to detect circular RNA genomes**, indicative of viroid-like entities.
- Through this approach, they analyzed **5.4 million RNA sequence datasets** from **human gut bacteria**, identifying **29,959 distinct obelisks** across **220,000 datasets**.
- Further exploration showed **obelisks also present in bacteria** from the **human mouth** and **across all seven continents**, highlighting their widespread presence.
- Unlike **viroids**, which have **small, circular RNA genomes** that do not code for proteins, **obelisks** have **larger RNA genomes** of about a **thousand base pairs** that appear to **code for two unique proteins**, unlike any known proteins from other life forms.
- This significant discovery broadens our understanding of the complexity and diversity of life forms, especially those at the micro-scale, living within the human body.

A link to *S. sanguini*:

- The recent discovery of ‘obelisks,’ a new form of life situated between viruses and viroids, faces a challenge in linking specific obelisks to their bacterial hosts due to the collective analysis of RNA data from gut or oral bacteria.
- However, by individually analyzing RNA from lab-grown bacteria, researchers successfully linked a particular obelisk to *Streptococcus sanguini*, a species common in the human mouth.
- This finding raises several questions about obelisks, including their replication process, transmission methods, potential pathogenicity to bacteria, evolutionary history, and possible impacts on human health and disease.
- Despite these uncertainties, the discovery highlights the blurring lines between life and non-life, emphasizing the complexity and diversity of life forms at the microscopic level.

Topic 14. GOOGLE DEEPMIND’S GENIE

Important for the subject: Science and technology



Google DeepMind has just introduced Genie, a new model that can generate interactive video games from just a text or image prompt.

- The research paper ‘Genie: Generative Interactive Environments’ states that Genie is the first generative interactive environment that has been trained in an unsupervised manner from unlabelled internet videos.

What is Genie?

- **Genie is a foundation world model that is trained on videos sourced from the Internet.**
- **The model can generate an endless variety of playable (action-controllable) worlds from synthetic images, photographs, and even sketches.**
- **When it comes to size, Genie stands at 11B parameters and consists of a spatiotemporal video tokenizer, an autoregressive dynamics model, and a simple and scalable latent action model.**
- **These technical specifications let Genie act in generated environments on a frame-by-frame basis even in the absence of training, labels, or any other domain-specific requirements.**

What does Genie do?

- **Genie is a new kind of generative AI that enables anyone, even children, to dream up and step into generated worlds similar to human-designed simulated environments.**
- **Genie can be prompted to generate a diverse set of interactive and controllable environments although it is trained on video-only data.**

Topic 15. TURNING MUSHROOMS INTO GOLD? GOA RESEARCHERS CLAIM BREAKTHROUGH IN PRODUCING NANOPARTICLES

Important for the subject: Science and technology



Two researchers in Goa have said that they **synthesize gold nanoparticles from a wild mushroom species** that is widely eaten as a delicacy in the coastal state.

- **The research, titled ‘Biosynthesis and characterisation of AuNPs produced using Termitomyces heimii Pellets’ was published recently in the Geomicrobiology Journal published by Taylor and Francis.**
- **According to the new research, this species of mushroom has been cultured in a pure three-dimensional pelletised form and successfully used to produce gold nanoparticles.**



- Goa has the largest species diversity and gene pool of the **wild edible Termitomyces mushrooms**.

About the Termitomyces species:

- The **Termitomyces species**, which grows on **termite hills** and is **locally known as 'roenolmi'**, has been cultured in a pure three-dimensional pelletised form and successfully used to produce gold nanoparticles.
- Termitomycesheimii** is a species of **agaric fungus in the family Lyophyllaceae**. It has a **symbiotic relationship with termites**.
- The specific epithet **heimii** honors **French mycologist Roger Heim**.
- The **fruit bodies (mushrooms) produced by the fungus are edible**.
- For the first time, this species of mushroom has been **brought into pure culture, grown as pellets, and used to produce gold nanoparticles**.
- The breakthrough pioneers the use of an **eco-friendly species for mass production of gold nanoparticles**.
- The **Nagoya protocol gives Goa State Biodiversity Board (GSBB)** the mandate to use these resources for industries while sharing benefits with the local community.

Topic 16. THE GENOME INDIA PROJECT, AIMED AT CREATING A GENETIC MAP OF THE COUNTRY

Important for the subject: Science and technology



The government's **Genome India initiative** on Tuesday (February 27) announced the successful sequencing of 10,000 whole genomes of healthy persons from across the country, creating a genetic map of the population.

- The **Genome India project** can help identify genetic mutations in Indian populations that make them vulnerable to specific diseases, and develop cures for such diseases.
- Researchers from **20 science institutes across the country helped in collecting the blood samples, sequencing the genome, developing a methodology, and storing the data.**
- With each sequence requiring 80 GB storage space, the huge dataset of 8 petabytes will be stored at the **Indian Biological Data Centre in Faridabad.**
- This dataset will be made available to researchers as **“digital public good.”**

What is the Genome India project?

- The Genome India project was approved by the government in **2020 with the aim of creating a comprehensive catalogue of genetic variations found in the Indian population.**
- A map of genetic diversity is essential for understanding the history of **our evolution, discovering the genetic basis for various diseases, and creating therapies of the future.**
- This cannot be done using data available in existing international databases, as Indian genomes are likely to be different from that of other populations.
- Researchers who analyzed **5,750 of the genome sequences have already identified 135 million genetic variants found in India.**

What is a genome, how is it sequenced?

- The human genome is essentially a biological instruction manual that we inherit from our parents.
- The **four bases in DNA are adenine (A), cytosine (C), guanine (G), and thymine (T) are present here.**
- The four base pairs ie **A,C,G, and T that come together to create everyone's unique genetic makeup.**
- There are around **3 billion pairs of bases in the complete human genome.**
- This contains all the information needed to create your physical form and maintain it throughout life.
- From your **height, color of the eyes, the genetic diseases you get or those you are at a higher risk for, everything is determined by the genetic makeup.**
- To sequence the genome, **researchers first extract the information from the blood.**

- Senior scientist at the Centre for Cellular and Molecular Biology in Hyderabad, cited the example of a mutation, MYBPC3, which leads to cardiac arrest at a young age.
- It is found in 4.5% of the Indian population but is rare globally.
- Another mutation called LAMB3 causes a lethal skin condition, which is found in nearly 4% of the population near Madurai, but it is not seen in global databases.
- **It can help in targeted treatments, especially for rare diseases that usually arise from genetic anomalies.**

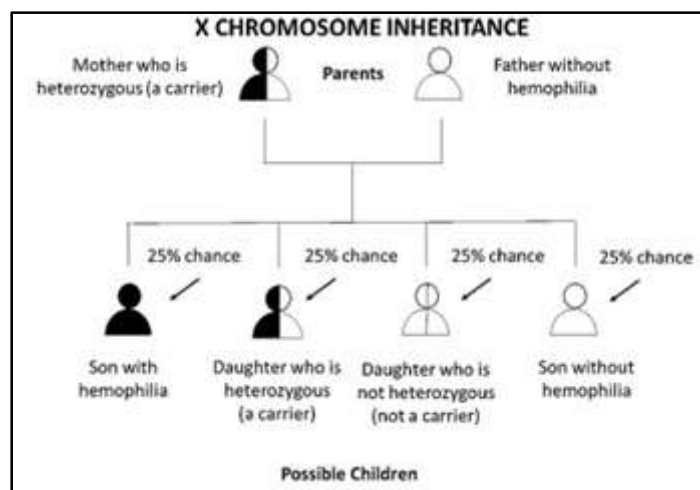


- The first whole human genome was sequenced with the collaboration of an international team.
- It took 13 years and \$3 billion, and was completed in 2003.
- India announced its first complete human genome in 2009.

- The samples were collected from the remotest parts of the country, covering various tribal populations as well.
- In all, 99 distinct population groups were covered by the project.

Topic 17. FIRST HUMAN CLINICAL TRIAL OF GENE THERAPY FOR HEMOPHILIA A (FVIII DEFICIENCY)

Important for the subject: Science and technology



India has conducted the **first human clinical trial of gene therapy for haemophilia A (FVIII deficiency) at Christian Medical College (CMC) Vellore.**

- The trials involved deploying a **novel technology of using a lentiviral vector to express a FVIII transgene** in the patient's own haematopoietic stem cell which will then express FVIII from specific differentiated blood cells.

About Haemophilia:

- Hemophilia is usually an **inherited bleeding disorder** in which the blood doesn't clot properly.
- This can lead to spontaneous bleeding as well as bleeding following injuries or surgery.
- Blood contains many proteins called clotting factors that can help to stop bleeding.

Types of Haemophilia:

Congenital hemophilia

- **Hemophilia is usually inherited**, meaning a person is born with the disorder (congenital). **Congenital hemophilia is classified by the type of clotting factor that's low.**
- The most common type is hemophilia A, associated with a low level of factor 8 The next most common type is **hemophilia B, associated with a low level of factor 9.**

Acquired hemophilia

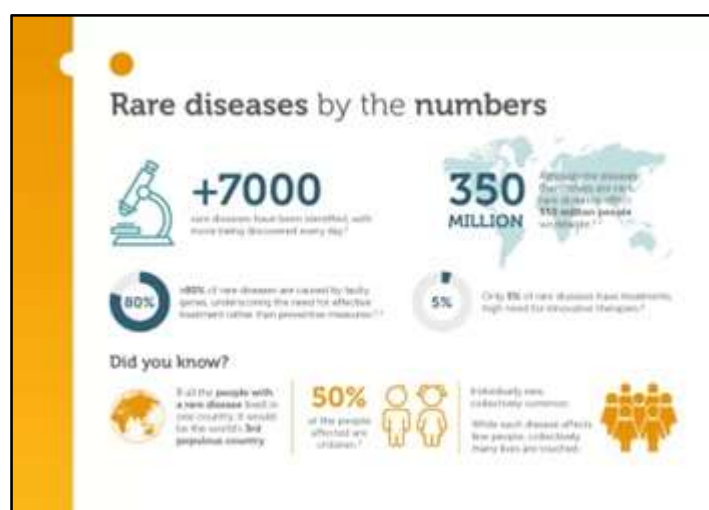
- Some people develop **hemophilia with no family history of the disorder.**
- This is called acquired hemophilia.
- Acquired hemophilia is a variety of the condition that occurs when a **person's immune system attacks clotting factor 8 or 9 in the blood.**

Hemophilia inheritance

- In the most common types of **hemophilia, the faulty gene is located on the X chromosome.** Everyone has two sex chromosomes, one from each parent.
- **Females inherit an X chromosome from the mother and an X chromosome from the father. Males inherit an X chromosome from the mother and a Y chromosome from the father.**
- This means that hemophilia almost always occurs in boys and is passed from mother to son through one of the mother's genes.

Topic 18. INDIA'S FIGHT AGAINST RARE DISEASES

Important for the subject: Science and technology



The tragic death of 19-year-old child actress Suhani Bhatnagar from dermatomyositis, a rare disorder that causes inflammation in muscles, came in the same month as Rare Disease Day, which is marked today.

- The last day of February every year is consecrated to support crores of individuals who, because of their rare medical conditions, have long been neglected and stigmatized.
- According to the **World Health Organization, rare diseases afflict 1 or less per 1,000 population.**
- Barely **5% of the over 7,000 known diseases worldwide are treatable.**

- Most patients typically receive only basic treatment that alleviates symptoms.

What are 'rare diseases'?

- These are often serious, chronic, and life-threatening conditions.
- **WHO defines a rare disease as an often-debilitating lifelong disease or disorder with a prevalence of 1 or less, per 1000 population.**
- However, different countries have their own definitions.
- **A disease or disorder is defined as rare in India when it affects fewer than 1 in 2500 individuals.**
- There may be as many as **7,000 rare diseases**, individual diseases may be rare, and the total number of people with a rare disease is large.
- Examples: **Lysosomal Storage Disorders (LSD), Gaucher disease, Pompe disease, cystic fibrosis, muscular dystrophy, spina bifida, hemophilia, MPS 1 and 2, and Fabry disease.**

Treatment:

- **About 95% of rare diseases** have no approved treatment even when a correct diagnosis is made.
- Rare diseases are also called 'orphan diseases' and drugs to treat them are called "orphan drugs" because of the expensive nature of available drugs.

Rare diseases in India

- India accounts for one-third of the global rare disease incidence, **with over 450 identified diseases.**
- These range from widely known ones such as **Spinal Muscular Atrophy and Gaucher's disease to lesser-known ones such as Mucopolysaccharidosis type 1 and Whipple's disease.**
- About 8 crore-10 crore Indians suffer from one rare disease or another; **over 75% are children.**

About National Policy of Rare Diseases (NPRD)

- The National Policy of Rare Diseases (NPRD) was notified in March 2021.

Aim:

- To increase focus on indigenous research and local production of medicines.
- To lower the cost of treatment of rare diseases.
- To screen and detect rare diseases early at early stages, which will in turn help in their prevention.

Categorization:

The policy has categorized rare diseases into three groups:

- Group 1: Disorders amenable to one-time curative treatment.
- Group 2: Those requiring long-term or lifelong treatment.
- Group 3: Diseases for which definitive treatment is available but challenges are to make an optimal patient selection for benefit, very high cost, and lifelong therapy.

Financial Support:

- Provision for financial support of up to Rs. 50 lakhs to the patients suffering from any category of Rare Diseases and for treatment in any of the Centre of Excellence (CoE) mentioned in NPRD-2021, outside the Umbrella Scheme of Rashtriya Arogya Nidhi.
- **Rashtriya Arogya Nidhi:** The Scheme provides financial assistance to patients, living below the poverty line (BPL) and who are suffering from major life-threatening diseases, to receive medical treatment at any of the super speciality Government hospitals/institutes.

Centers of Excellence:

- The policy aims to strengthen tertiary health care facilities for the prevention and treatment of rare diseases through designating eight health facilities as 'Centres of Excellence and these will also be provided one-time financial support of up to Rs. 5 crores for the upgradation of diagnostics facilities.

Challenges in India:

- We still don't define 'rare diseases', a failure the policy attributes to a lack of sufficient data, as if regular data collection and epidemiological assessments are not the government's job.
- Less than 50% of the 450-odd rare diseases identified in India are treatable. Treatments approved by the Drugs Controller General of India are available for just about 20 rare diseases and can be availed only from Centres of Excellence (CoEs).
- Since CoEs are few (12), unevenly distributed, and uncoordinated, late diagnosis, inadequate therapies and lack of timely availability are the norm.
- The Budget's allocation for rare diseases, although increasing over the years, remains low at ₹93 crore for 2023-2024.
- Last year, the government waived off GST and customs duty on medicines for rare diseases.
- But this exemption applies only to drugs which are to be "imported for personal use" and not to the ones commercially available in India.

Topic 19. THE ROCKY VISTA OF MEDICINAL CANNABIS THAT RESEARCH IS BRINGING INTO VIEW

Important for the subject: Science and technology

The **cannabis plant, Cannabis sativa**, is being explored for its **potential effects on mood and cognition**, with a particular interest in its use for managing conditions like **schizophrenia, cannabis-use disorders, and heroin-use disorders**.

- In a notable development, the **University of British Columbia in Canada** is conducting a clinical trial to investigate the use of **cannabidiol (CBD)** for **treating bipolar depression**, a condition currently lacking effective treatment options for its depressive episodes.
- **Cannabidiol (CBD)** is a **phytocannabinoid** and one of **113 identified cannabinoids** in **cannabis plants**, along with **tetrahydrocannabinol**, and accounts for up to **40%** of the **plant's extract**.
- **Delta-9-tetrahydrocannabinol (THC)** is identified as the **primary psychoactive component in cannabis**, whereas **CBD** is attracting attention for its possible **antipsychotic, anti-inflammatory, and neuroprotective benefits**.
- The **potency of cannabis is higher in the flowering parts** compared to the **leaves**.
- **Marijuana**, composed of the **buds and leaves of pollinated female plants**, is typically grown outdoors.

The cannabinoid system:

- The **human cannabinoid system** consists of **two main receptors: CB1 and CB2**.
- **CB1 receptors**, predominantly located in the **central nervous system (CNS)**, play a significant role in **modulating neurotransmitter release, affecting dopamine, noradrenaline, and serotonin levels**.
- This **receptor** is crucial for the **psychoactive effects** of drugs.
- **CB2 receptors** are **primarily found in the spleen and testes**, with lesser presence in the **CNS**. The **natural substrate for CB1** is **anandamide**, named after the Sanskrit word for bliss, '**ananda**'.
- The **endocannabinoid system (ECS)**, which includes these **receptors** and **endogenous cannabinoids (endocannabinoids)**, is involved in regulating various bodily functions like **pain, memory, motor control, sleep, and appetite**.
- **THC**, a compound in **cannabis**, is known for its effects on **motor control and memory** and has potential implications for treating conditions like **PTSD** by possibly aiding in the extinction of traumatic memories.

The rimonabant debacle:

- The involvement of the **endocannabinoid system (ECS)** in **regulating hunger** led to the **hypothesis** that **blocking the CB1 receptor could facilitate weight loss**, inspired by the known effect of **THC** in inducing **cravings for high-calorie foods**.
- Based on this, **Sanofi-Aventis** launched **rimonabant**, a **CB1 receptor blocker**, in **Europe** in **2006** as an **anti-obesity medication**.
- Although the drug was effective in reducing weight, it was associated with severe side effects, including **depression** and **suicidal tendencies**, leading to its **withdrawal from the market**.
- Despite the **rimonabant setback**, **THC** and **synthetic cannabinoids** have found applications in stimulating **appetite** among patients with **HIV-AIDS** and **cancer**, and in alleviating **chemotherapy-induced nausea**.
- They are also used in treating various **pain syndromes**, with nabilone helping in **chronic neuropathic pain**, **headache**, and **fibromyalgia**, and **Sativex (combining THC and CBD)** being utilized for pain management in multiple sclerosis.
- The question of **THC's addictive potential** remains debated among psychiatrists.
- While animal studies indicate **addictive responses**, **human data are more mixed**, with **many users not escalating their THC consumption** after reaching a certain level.
- This plateau effect might be due to **THC's fat solubility**, allowing it to **stay in the brain for extended periods and be excreted slowly**.
- Consequently, **THC withdrawal**, unlike **nicotine or alcohol withdrawal**, lacks rapid and severe symptoms, typically manifesting as **sleep issues**, **appetite loss**, **weight loss**, **restlessness**, **irritability**, and **anger**.

Effects on anxiety and mood:

- The **mood effects of cannabis are complex** and not fully supported by rigorous studies for conditions like **treatment-resistant depression**.
- **Cannabis** has been linked to **depression** in many studies. For **bipolar disorder**, there is **limited scientific investigation**, but some research indicates that cannabis use in individuals with **bipolar disorder** may lead to more **manic relapses**, **less adherence to medication**, and **poorer psychosocial outcomes**.
- Additionally, **cannabis** use may increase the **risk of developing bipolar disorder** or trigger its onset in some individuals.
- **Cannabis** can have **psychotic effects**, with the risk varying based on the individual's experience with the drug, context of use, and predisposition to psychosis.

- **Cannabis use**, especially in **youth**, can **hasten** the onset of **schizophrenia** in **genetically predisposed individuals**.
- On the **policy front**, **Cannabis sativa** is the most widely used **illicit drug globally**, with its use and potency increasing significantly.
- This has led to debates about **decriminalizing cannabis**, particularly given the interest in its medical applications.
- Jurisdictions worldwide are **legalizing medical** and, in some cases, **recreational cannabis use**.
- Policymakers are urged to consider regulations that **prevent commercialization and protect vulnerable populations**, such as **children, adolescents, and individuals with mental illnesses**, from the harmful effects of cannabis.

Topic 20. 40 SPOTTED DEER TRANSLOCATED WITHIN KARNATAKA MARKING A NEW ERA IN WILDLIFE MANAGEMENT

Important for the subject: Environment



The **Sri Chamarajendra Zoo of Mysuru** has undertaken a significant **wildlife conservation effort** by **translocating 40 spotted deer** from **Ittigagud in Mysuru** to the **Pansoli range in the Kali Tiger Reserve, Dandeli, Uttara Kannada district**.

- This operation marks a pioneering achievement in South India, especially given the scale and success of the translocation, which saw no fatalities or significant stress among the animals.
- The **initiative**, led by **Principal Chief Conservator of Forests (PCCF)**, aims to address the issue of **excessive breeding of herbivores in captivity** by **relocating them to natural habitats** where they can **roam freely and maintain ecological balance**.
- The **Kali Tiger Reserve** was chosen due to its **low prey-density** and the **opportunity for herbivores to thrive**, contributing to the **ecosystem's health**.

- Concerns were raised about the **potential transmission of pathogens from captive-bred animals to wildlife.**

Spotted deer:

- The **chital** or **cheetal** (*Axis axis*), also known as the **spotted deer**, **chital deer** and **axis deer**, is a deer species **native to the Indian subcontinent.**
- It was first described and given a binomial name by German naturalist Johann Christian Polycarp Erxleben in 1777.
- It is sexually **dimorphic**; males are larger than females, and **antlers are present only on males.**
- The upper parts are golden to rufous, completely covered in white spots. The abdomen, rump, throat, insides of legs, ears, and tail are all white. The antlers, **three-pronged**, are nearly 1 m (3 ft 3 in) long.

Places in news:

- Sri Chamarajendra Zoo** of Mysuru, Karnataka
- Kali Tiger Reserve, Dandeli, Uttara Kannada district of Karnataka-**
- The park is a habitat of **Bengal tigers**, **black panthers** and **Indian elephants**, amongst other distinctive fauna. The **Kali River** flows through the tiger reserve and is the lifeline of the ecosystem and hence the name.
- In December 2015, **Dandeli Anshi Tiger reserve** was renamed to **Kali Tiger Reserve.**

Topic 21. HC SAYS ANIMALS SHOULDN'T BE NAMED AFTER GOD, URGES BENGAL GOVT TO CHANGE NAMES OF LIONESSE 'SITA' AND LION 'AKBAR'

Important for the subject: Environment

The **Jalpaiguri Circuit Bench** of the **Calcutta High Court** has advised the **West Bengal government** to consider **renaming** a **lioness** and **lion** named **'Sita'** and **'Akbar'** at the **Siliguri zoo**, as it is inappropriate to name animals after revered figures such as **gods**, **mythological heroes**, **freedom fighters**, or **Nobel laureates.**

- The court has allowed the petitioners to reclassify their **writ petition** as a **public interest litigation (PIL)**, emphasizing the **need to respect religious sentiments and the secular nature of the state.**
- The state counsel mentioned that the naming occurred in **Tripura**, with the responsibility lying with the **Tripura Zoo authorities.**

- The **West Bengal Forest Department** clarified that the **lion and lioness**, named ‘**Ram**’ and ‘**Sita**’ in official records, were transferred from **Tripura’s Sepahijala Zoo** to **Siliguri zoo** as part of an **animal exchange program**.

Guidelines for exchange or transfer of animals between Zoos:

- The **Zoo owners** and **Zoo managers** have to respond to the need for conservation of various species of wild animals and contribute to it by way of donating and loaning or giving in exchange of some other species,
- the single/ unpaired and surplus animals of endangered species for the conservation programmes identified by the **Central Zoo Authority**.
- **Central Zoo Authority** will take every care that all the Zoos are benefited from the exchange programme.

Rules:

- The **Member Secretary** may **issue approval** of **Central Zoo Authority** for **exchange proposal** involving the wild animal species/individuals not part of the approved Coordinated Conservation Breeding Programme, if satisfying the guidelines.
- All the exchange proposals of wild animal species/ individuals between Indian Zoos forming part of approved **Coordinated Conservation Breeding Programme** will be placed in the **Technical Committee** for **approval**.
- All the exchange proposals between Indian and Foreign Zoos will be decided by the **Central Zoo Authority** as per recommendations made by the Technical Committee.
- In urgent cases and where the meeting of the **Technical Committee** or/and **Central Zoo Authority** is not likely to be held immediately,
- the **Member Secretary** may issue the approval of **Central Zoo Authority** for such exchange proposals which satisfy the guidelines with the approval of the **Chairman, Technical Committee and/or Chairman, Central Zoo Authority** respectively as the case may be.
- However, **ex-post-facto approval** will be taken from **Technical Committee and/or the Central Zoo Authority** (as the case may be) will be taken for all such proposals in the next Meeting.
- **Schedule 3 (9) of Rule 10 under Recognition of Zoo Rules, 2009 (Amendment) Rules, 2013** which reads as “Any decision of the Central Zoo Authority about any animal being sent to a particular Zoo for augmenting the number of founder animals for the conservation breeding programme of the species shall be binding on the concerned Zoo.”
- will any means be implemented once issued by the **Central Zoo Authority**.

Places in news:

- Sepahijala Zoo– Tripura
- Siliguri Zoo– West Bengal

Topic 22. FIFTEEN NON-PROFITS TAKE FRESH LEGAL ACTION AGAINST EUROPE'S BIGGEST PLASTICS PROJECT

Important for the subject: Environment

Client Earth, Greenpeace, WWF, and 12 other non-profits are challenging the **Flemish Authority's** approval of **INEOS' €3 billion plastics project in Belgium**, citing it as **Europe's largest potential plastics facility**.

- This legal action, initiated on February 22, 2024, extends a **three-year battle** against the project, which a **Belgian court deemed illegal in July 2023** due to its **potential violation of the EU Habitats Directive by increasing nitrogen pollution**.
- Despite **government** and **INEOS claims** of **negligible environmental impact**, the **NGOs argue** the **project's approval bypassed necessary impact assessments, violating EU and national laws**.
- They emphasize the **project's dire implications for environmental, climate, and public health**, highlighting the **excessive nitrogen pollution** it would introduce to protected areas and its **contribution to the global plastics and climate crisis**.
- The case is validated by the **Council of Permit Disputes**.

Topic 23. AN INDEX FOR MONITORING THE EFFECTIVENESS OF CLIMATE-SMART AGRICULTURE PRACTICES: HOW IT CAN HELP

Important for the subject: Environment

Index to evaluate Climate-smart agriculture (CSA) practices:

Developed by: Researchers from the **Indian Institute of Forest Management (Bhopal)** and **Solidaridad Network**

- **Aim:** To evaluate **Climate-smart agriculture (CSA) practices in India**, aiming to **enhance environmental sustainability, resource efficiency, income, and sustainable farm production**.
- These **practices include interventions like improved seeds, integrated nutrient management practices, crop residue management practices, direct seeding of rice, zero tillage farming, mulching, and agroforestry**, supported by government initiatives across various states.
- Introduced by the **FAO in 2010**, **CSA's evaluation involved 34 indicators across five dimensions: governance, farm management practices, environment management,**

energy management, and awareness and training, with the latter being identified as the **most critical** for CSA adoption.

Climate Smart Agriculture: Characteristics

- Contrary to conventional agricultural development, CSA systematically integrates **climate change** into the **planning and development of sustainable agricultural systems**. CSA's **three primary pillars** are interrelated concerns-increased productivity, enhanced resilience and reduced emissions.
- However, the resultant trade-offs often cannot maximize the pillars simultaneously, only optimize them. v CSA maintains ecosystem services: Ecosystems provide the agricultural sector with a number of unpaid services –clean natural water, materials, food, sunlight etc.
- CSA attempts to ensure the sustainability of these services, preventing their degradation. CSA is not a rigid set of particular practices, technologies or methodologies- it is only a concept amenable to adaptation.
- It has multiple entry points, ranging from the development of technologies and practices to the elaboration of climate change models and scenarios, information technology, insurance schemes, value chains and the strengthening of institutional and political enabling environments.

Key Government Initiatives on CSA

- **National Innovation on Climate Resilient Agriculture (NICRA)**:National Innovations in Climate Resilient Agriculture (NICRA) is a network project of the Indian Council of Agricultural Research (ICAR) launched in February, 2011 with an outlay of Rs.350 crores.
- The project aims to enhance the resilience of Indian agriculture, covering crops, livestock and fisheries to climatic variability and climate change through development and application of improved production and risk management technologies. National Mission on Sustainable Agriculture (NMSA).
- The Government is implementing the National Action Plan on Climate Change (NAPCC) which provides the overarching framework for climate actions, through national missions in specific areas.
- **The National Mission for Sustainable Agriculture (NMSA)**, one of the Missions under NAPCC, includes programmatic interventions like Soil Health Card, Paramparagat Krishi Vikas Yojana, Mission Organic Value Chain Development for Northeastern Region, Rainfed Area Development, National Bamboo Mission and Sub-mission on Agro-Forestry.

- The NMSA works through adoption of sustainable development pathway by progressively shifting to environment friendly technologies, adoption of energy efficient equipments, conservation of natural resources, integrated farming, etc.
- Besides, the NMSA aims at promoting location specific improved agronomic practices through soil health management, enhanced water use efficiency, judicious use of chemicals, crop diversification.
- **The National Adaptation Fund for Climate Change (NAFCC):** The National Adaptation Fund for Climate Change (NAFCC) was established to meet the cost of adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change.
- This Scheme was implemented during 2015-16 mainly for supporting concrete adaptation activities dealing with mitigating the adverse effects of global climate change in various sectors including agriculture.
- Under the NAFCC, various projects have been sanctioned in different states i.e., Punjab, Himachal Pradesh, Odisha, Manipur, Tamil Nadu, Kerala, Mizoram, Chhattisgarh, J&K, Meghalaya, Telangana, Andhra Pradesh etc.
- **Climate Smart Village:** Climate-smart village (CSV) is an institutional approach to test, implement, modify and promote CSA at the local level and to enhance farmers' abilities to adapt to climate change.
- The CSV adopts a portfolio of interventions to tackle the climate challenges of the agriculture sector that cover the full spectrum of farm activities. Various Consultative Group on International Agricultural Research (CGIAR) centers and national research organisations are putting their concerted efforts into the CSVs in India.
- CSVs were piloted in two states of India: Karnal district of Haryana state and Vaishali district of Bihar state which later spread into districts of Punjab, Andhra Pradesh and Karnataka.
- **Pradhan Mantri Krishi Sinchayee Yojna (PMSKY):** This Scheme was planned and formulated to give more priority on water conservation and its management in agriculture with the vision to extend the area under irrigation from 1 July 2015.
- The main motto of this Scheme is 'Har Khet Ko Paani' to improve water use efficiency. 'More crop per drop' scheme provide end-to-end solutions in water on source creation, distribution channels and its management.

- **Pradhan Mantri Fasal Bima Yojna (PMFBY):** The Pradhan Mantri Fasal Bima Yojana (PMFBY) introduced in the country from Kharif 2016 season is voluntary for States/UTs as well as for farmers. States/UTs can participate in the scheme keeping in view their risk perception and financial considerations etc.
- From inception of the scheme till 2020-21 cumulatively 2,938.7 lakh farmer applications for a sum insured of Rs. 10,49,342 crore have been enrolled under the scheme.
- **Soil Health Card Scheme:** This Scheme was launched in February, 2015 to issue soil health cards (SHC) to the farmers providing detailed information on test-based soil nutrient status of their own land along with recommended dose of fertilizers for improving productivity through judicious use of inputs. The Government of India targeted to issue 10.48 crores of SHCs since inception of the Scheme.
- **National Water Mission (NWM):** A Mission was mounted to ensure Integrated Water Resource Management (IWRM) for conserving the water sources and minimizing its wastage, and also to optimize Water Use Efficiency (WUE) by 20 per cent including agriculture sector.
- **Paramparagat Krishi Vikas Yojna (PKVY):** It is an extended component of Soil Health Management (SHM) launched in 2015 under NMSA with the objective of supporting and promoting organic farming through adoption of organic village by cluster approach, which in turn result in improvement of soil **health**.
- **Biotech-KISAN:** It is a scientist-farmer partnership scheme launched in 2017 for agriculture innovation with an objective to connect science laboratories with the farmers to find out innovative solutions and technologies to be applied at farm level.
- Under this scheme, so far 146 Biotech-KISAN Hubs have been established covering all 15 agroclimatic zones and 110 aspirational districts in the country. The scheme has benefitted over two lakhs farmers so far by increasing their agriculture output and income. Over 200 entrepreneurship have also been developed in rural areas.
- **Neem Coated Urea:** It is a form of urea fertilizer coated with neem extracted material, which acts as a slow releaser of nitrogen reducing the pest and disease infestation ultimately minimizing the usage of chemicals in farming by achieving the overall increase in crop yield.
- **Sub-mission on Agro-forestry:** This Mission was launched during 2016-17 with the objective of planting trees on farm bunds. Agro-forestry has the potential to bring sustainability in agriculture and also achieving the optimum productivity by mitigating the impact of climate change.

- **National Livestock Mission:** This Mission was initiated by the Ministry of Agriculture and Farmers' Welfare and got commenced from 2014-15 focusing mainly on livestock development through sustainable approach ultimately protecting the natural environment, ensuring bio-security, conserving animal bio-diversity and farmers' livelihood.

CSA and farm productivity:

- A new study found a **strong correlation** between **farm productivity and CSA**, utilizing a **multidimensional indicator-based framework** to calculate a **"climate smartness" score** at the **farm level**.
- The research, conducted in **Madhya Pradesh** across **three districts** with **diverse agro-climatic zones**, analyzed data from **315 farmers** during the **2019-2020** cropping seasons.
- It highlighted the importance of **training and awareness** in **adopting CSA practices**, showing **no significant difference** among the indicators but underscoring training as key to implementation success.
- This study suggests that the **framework** could **aid policymakers, researchers, and practitioners** in designing and upscaling **CSA practices**, which is vital as the **global population grows** and climate change impacts agriculture, necessitating a shift towards more sustainable practices.

Topic 24. INGER ANDERSEN URGES INCLUSION OF 'SUPER POLLUTANTS' SUCH AS METHANE AND BLACK CARBON IN NDCS

Important for the subject: Environment

Super Pollutant	Global warming potential (100-year)	Lifetime in atmosphere	Primary source
Methane	21	12 years	Agriculture, mobile sources, electricity generation
Black carbon, or soot	330-2,240	Days to weeks	Incomplete combustion of fossil fuels, biofuels, biomass
Hydrofluorocarbons, or HFCs	140-11,700	15 years on average	Substitution of ODS, electricity generation

The Climate and Clean Air Conference 2024 began on February 21, ahead of the sixth United Nations Environment Assembly (UNEA-6), with a call for international collaboration

to phase-out short-lived climate pollutants, or “super pollutants”, such as methane, black carbon and hydro fluorocarbons.

- **UNEA-6 will be held in Nairobi from February 26 to March 1** under the theme of “effective, inclusive and sustainable multilateral actions to tackle the triple planetary crisis: climate change, nature and biodiversity loss, and pollution and waste.”
- It urged countries to include ‘Super pollutants’ such as methane and black carbon in **Nationally Determined Contributions (NDC)**.
- Significance of agreements such as the **Kigali Amendment, the Montreal Protocol and the Global Methane Pledge to remove super pollutants from the atmosphere was highlighted.**

About Super Pollutants:

- Super pollutants, also sometimes referred to as **short-lived climate pollutants (SCLPs)**, derive their name from their relatively short life in the atmosphere as compared to carbon dioxide.
- For example, **black carbon has a lifespan in the atmosphere of just a few days before falling to the earth, and methane persists for a little more than a decade.**
- Other examples are **Methane, frabout Hydroflourocarbons and Ground Level Ozone.**

About Emission Gap Report (2023)

- UNEP has published the **14th Emission Gap Report 2023.**
- There is only a 14 percent chance of limiting global warming to 1.5 degrees Celsius over pre-industrial levels, considering the most optimistic climate action projects.
- Even if the existing nationally determined contributions (NDC), both conditional and unconditional, are delivered by 2030, the world will warm by **2.5°C, breaching the 2°C target set by the Paris Agreement.**

Global Methane Pledge

- **The pledge was first announced in September by the US and EU**, and is essentially an agreement to reduce global methane emissions.
- One of the central aims of this agreement is to cut down methane emissions by up to **30 per cent from 2020 levels by the year 2030.**

About United Nations Environment Programme (UNEP)- Background:

In 1972, the UNGA passed what is formally known as UN-Resolution 2997.

- It would be the last step in the establishment of the **United Nations Environment Programme (UNEP)** – an organization conceived to spearhead a global effort to minimize humanity's footprint on the planet.

Headquarters: Nairobi, Kenya.

Governing Body: UNEA(formed in 2012) – meets once in two years.

- It hosts various Conventions like **Minamata Convention, UNCBD, CITES, Basel Convention, Stockholm Convention, Rotterdam Convention, Montreal Protocol, Vienna Convention, CMS, Carpathian, Bamako, Tehran Convention.**
- Important Treaties signed under UNEP are **IPCC, Conservation of Migratory Species (CMS), Global Environment Facility (GEF) and the Multilateral Fund for the implementation of Montreal Protocol.**

Topic 25. WEALTHY NATIONS WRESTLE OVER SEATS ON LOSS AND DAMAGE BOARD, CAUSING DELAYS IN FULLY OPERATIONALIZING FUND

Important for the subject: Environment

Developed countries have delayed nominating members to the **Loss and Damage Board**, hampering efforts to fully operationalise the fund to developing countries in time.

- At the **27th Conference of Parties to the United Nations Framework Convention on Climate Change (COP27) held in Egypt**, Parties reached an agreement on providing loss and damage funding to nations most vulnerable and impacted by the effects of climate change.
- At **COP28, the fund was formally established.**

Governance Mechanisms:

- A decision text released at **COP28** stated that the fund would be governed and supervised by a board, a decision-making body.
- It is tasked with setting up a **strategic direction for the Fund** as well as its governance and operational modalities, policies, frameworks and work programme, including relevant funding decisions.
- The **Board will comprise 26 members, 12 members from developed countries and 14 from developing nations.**

About Loss and Damage Fund:

- The **Intergovernmental Panel for Climate Change (IPCC)** defines 'loss and damage' as the economic and non-economic impacts of climate change, including extreme and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change.

- It's **destructive, irreversible, and cannot be addressed by mitigation and adaptation measures.**

Genesis of the L&D fund:

- Historic pollution from Developed Countries has elevated the world's average surface temperature by more than 1 degree Celsius and is currently inflicting damage worldwide, but especially in the poorest nations.

CoP19 of UNFCCC- 2013: held at Warsaw, Poland.

- Countries agreed to formally establish the L&D fund.
- It was being created to provide financial and technical assistance to economically developing nations that were incurring L&D due to climate change.

CoP25 of UNFCCC: held at Madrid, Spain in 2019

- The Santiago Network for L&D was set up, but countries didn't commit any funds.
- The vision of the Santiago Network is to catalyze the technical assistance of relevant organizations, bodies, networks and experts, for the implementation of relevant approaches for averting, minimize and addressing L&D at the local, national and regional level, in developing countries that are particularly vulnerable to the adverse effects of climate change.

CoP26 of UNFCCC: held at Glasgow, U.K. in 2021

- The Glasgow Dialogue on finance for L&D was established to continue discussions over the next three years on the fund.

CoP27 of UNFCCC: held at Sharm El- Sheikh, Egypt in 2022

- Members agreed to set up the L&D fund and a Transitional Committee (TC) to figure out how the new funding mechanisms under the fund would operate.
- The TC was also to prepare recommendations that countries would consider, deliberate on, and potentially adopt by COP 28.
- **COP 28 adopted the decision** on the operationalization of the new funding arrangements, including a Fund, for responding to loss and damage.
- The decision was adopted by consensus by all Parties including India.

Topic 26. A PREHISTORIC CASE OF EDWARDS SYNDROME FOUND FOR THE FIRST TIME

Important for the subject: Environment

Researchers have uncovered **evidence of chromosomal disorders in prehistoric skeletal remains**, dating back up to **5,500 years**, marking a significant discovery in the field of **ancient genetics**.

- This includes **six cases of Down syndrome** and **one case of Edwards syndrome**, as detailed in a study published in Nature Communications.
- This research potentially marks the **first identification of Edwards syndrome from historic or prehistoric remains**.
- **Chromosomal trisomy**, the condition leading to these **disorders**, involves having **three copies of a chromosome instead of the usual two**.
- **Down syndrome** results from **trisomy of chromosome 21**, and **Edwards syndrome** from **chromosome 18**.
- The study involved **screening almost 10,000 genomes** from **ancient human remains across Europe**.
- The findings indicate that individuals with these **chromosomal disorders** often died at or shortly after birth, with some cases dating back to the **Bronze Age (around 2,700 BCE)** and the **Neolithic period (around 3,500 BCE)**.
- The research also highlights that certain societies may have had a **higher frequency of burials for individuals with trisomy conditions**, particularly in **early Iron Age Spain (800-400 BCE)**, suggesting a level of care and recognition for these individuals within their communities.
- Notably, some were given exceptional **burials** or **elaborate grave goods**, indicating their inclusion and value in their societies despite their **genetic disorders**.
- This study not only sheds light on the prevalence of **genetic disorders in ancient populations** but also provides insights into how these societies perceived and treated individuals with such conditions.

About Dawn syndrome:

- **Dawn syndrome** is a **genetic disorder**, caused by the **presence of an extra chromosome 21** also known as **trisomy of chromosome 21**.
- It is one of the **leading causes of genetic disorders** around the world.
- **Types of Down syndrome:** There are **three types** of Down syndrome.
- **Trisomy 21:** About **95%** of people with Down syndrome have **Trisomy 21**. With this type of **Down syndrome**, each cell in the body has **3** separate copies of **chromosome 21** instead of the usual **2 copies**.
- **Translocation Down syndrome:** This type accounts for a small percentage of people with **Down syndrome (about 3%)**. This occurs when an extra part or a whole extra chromosome 21 is present, but it is attached or **“trans-located”** to a different chromosome rather than being a separate **chromosome 21**.

- **Mosaic Down syndrome:** Mosaic means mixture or combination. For children with mosaic Down syndrome, some of their cells have 3 copies of chromosome 21, but other cells have the typical two copies of chromosome 21.

The primary symptoms of Down's Syndrome are as follows:

- Mental retardation
- Cognitive impairment may be mild to moderate
- Tilted eyes or Fold of the skin above the eye etc.
- **Treatment:** Down syndrome is a lifelong condition and it cannot be cured. Early therapy programs can help improve skills.

Topic 27. GHARIAL CONSERVATION SHOULD EXTEND TO UNPROTECTED RIVERS

Important for the subject: Environment

The **gharial population**, a **critically endangered species** and the **only surviving member** of the **genus Gavialis**, has seen a significant **decline** from **5,000 individuals** in the **1940s** to just a few hundred today.

- Focusing on the **Gandak River**, a **transboundary tributary** of the **Ganga** flowing through **Bihar** and **Uttar Pradesh**, the study highlights that **gharials** tend to **avoid areas with human activity**, preferring **undisturbed riverine habitats** with deeper pools.
- The presence of human settlements near riverbanks, fishing activities, fishing nets, feral dogs, cattle, river braiding, and changes in river flow due to damming are identified as **major threats**.
- These factors not only disturb the gharials but also potentially impact their physiology by reducing their basking time.
- While the **Gandak River** hosts a small but robust population, most gharials are found in the Ganga and its tributaries, including the **Chambal, Girwa, and Son rivers**.

Surviving in unprotected habitats:

- The **Gandak River**, unlike the **protected Chambal sanctuary**, presents unique challenges for the **gharials** inhabiting its waters due to its **unprotected status**.
- It's believed to host the **second-largest gharial population in India** and the **only breeding population in a non-protected area**, with a **2020 survey** recording **259 individuals**.
- However, there's scepticism regarding these numbers due to the practice of releasing gharials into the river, which doesn't necessarily mean they remain or thrive there.

- Despite these challenges, the **Gandak River**, mostly **unprotected** and **human-dominated**, except for the **Valmiki tiger reserve** and **Sohagi Barwa wildlife sanctuary**, is crucial for the conservation of **gharials**.

Threats to the gharial population:

- **Gharials**, **large piscivorous reptiles**, are **keystone species** in **freshwater river systems**, historically widespread but now **limited to India and Nepal**.
- They face **threats** from **extensive fishing**, which impacts their **food supply**, and from **fishing nets**, which can lead to **entanglement and drowning**.
- **Sand and boulder mining** disrupt their **nesting patterns**, and **feral dogs** pose a threat to their **eggs**.
- The study also points to the **impact of changing river flow dynamics** on **gharial survival**.
- **Damming and barraging alter water flow**, affecting the **river's natural system** crucial for **gharials**. **River braiding**, caused by **flood inclination** and **sudden irrigation discharges**, complicates population estimates and threatens younger gharials.

About Gharial:

- It is a **fresh-water crocodile** which lives in **deep fast-flowing rivers**.
- **Features:** Compared to **alligators and crocodiles**, a **Gharial** has a **very long and narrow snout** (instead of a broad snout).

Distribution:

- Globally Gharial is found **only in India and Nepal**.
- In India their major population occur in **three tributaries of the Ganga River**: the **Chambal** and the **Girwa Rivers** in **India** and the **Rapti-Naryani River** in **Nepal**.
- The **Gharial reserves of India** are located in **three States** – **Uttar Pradesh, Madhya Pradesh and Rajasthan**.

Conservation status:

- **IUCN:** Critically endangered.
- **Wildlife (Protection) Act, 1972:** Schedule I
- **CITES:** Appendix I

Conservation Initiatives:

- Breeding Centres of Kukrail Gharial Rehabilitation Centre in Lucknow, Uttar Pradesh.
- National Chambal Sanctuary (Madhya Pradesh).

Topic 28. A SACRIFICE IMMORTALISED

Important for the subject: Environment

The **Sammakka-Saralamma Jatara**, hosted by the village of **Medaram** in **Telangana's Mulugu district**, is celebrated **biennially** as the **nation's largest tribal fair**, commemorating the **valour of tribal warriors** who defended their **people's rights**.

About the Sammakka-Saralamma Jatara:

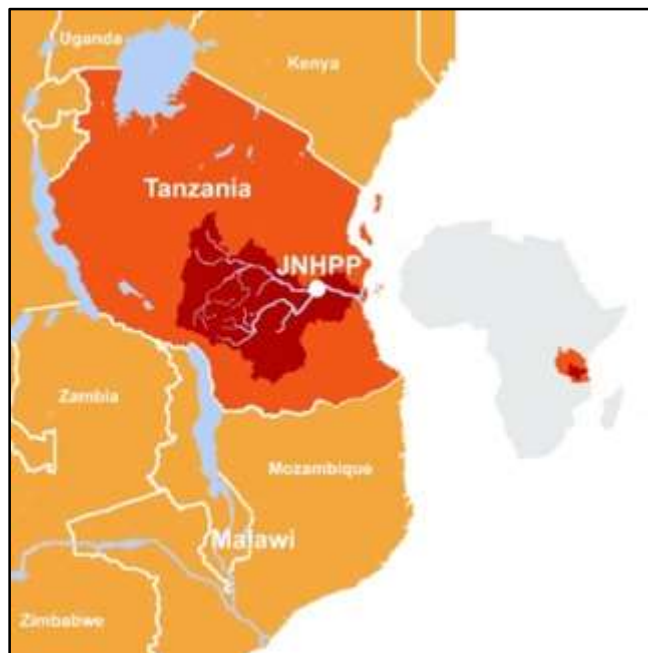
- Originating from a **12th-century legend**, it tells the story of **Sammakka**, found as a **baby** by the **tribal chieftain Medaraju** and **later married to Pagidigidda Raju**.
- The **narrative** unfolds with their **resistance against the Kakatiya king's tax demands during a drought**, leading to a **battle** where **Sammakka**, despite losing her family, **fought valiantly** and is believed to have **transformed into a goddess**.
- This fair, drawing around two crore attendees, is held on the **full moon day of Magha (February)**, maintaining **tribal customs** and led by **tribal priests**.
- Initially a **Koya tribal gathering**, it gained **State festival status** in **1998**, symbolizing a vital preservation of **tribal traditions** and heritage beyond its religious significance.

Key facts about the festival:

- Women carry bundles of **jaggery**, considered as precious as **gold**, to be offered to the deities at **Sammakka-Saralamma Jatara**.
- Devotees take a holy dip in the **Jampanna Vagu River**, a **tributary of River Godavari**.
- **Medaram** is a remote place in the **Eturnagaram Wildlife Sanctuary, Telangana**.
- It is a festival with **no Vedic or Brahmanic influence**.

Topic 29. TANZANIA SWITCHES ON THE FIRST TURBINE OF THE HYDRO UNIT IN WORLD HERITAGE SITE

Important for the subject: Environment



Tanzania has switched on the **first turbine** of a **new hydroelectric plant** set to **double power generation capacity** but which has drawn stiff opposition from conservationists because of its **location** in a **U.N.-designated World Heritage Site**.

- 2,115 megawatt (MW) **Julius Nyerere Hydropower Plant** is located on the **Rufji River basin** in the **Selous Game reserve**— a **UN-designated World Heritage Site**.

Selous Game Reserve:

- Now renamed as **Nyerere National Park**.
- The reserve is among the **largest protected areas** in **Africa**, harbouring one of the most significant concentrations of animals including African **bush elephant**, **south-central black rhinoceros**, **hippopotamus**, **lion**, **African wild dog**, **African buffalo**, **Masai giraffe**, **plains zebra** and **Nile crocodile**.

Key facts about Tanzania:

- It is a country in **East Africa** within the **African Great Lakes region**.
- It borders **Uganda** to the north; **Kenya** to the northeast; the **Indian Ocean** to the east; **Mozambique** and **Malawi** to the south; **Zambia** to the southwest; and **Rwanda**, **Burundi**, and the **Democratic Republic of the Congo** to the west.
- **Mount Kilimanjaro**, **Africa's highest mountain**, is in northeastern Tanzania.

Topic 30. MAJOR FIRMS STILL FAILING TO TACKLE DEFORESTATION: GLOBAL CANOPY

Important for the subject: Environment

The non-profit research group **Global Canopy** has **published a report** indicating that **many global brands connected to tropical forest loss do not have policies against deforestation.**

- The **Forest 500 report** assesses the impact of **350 companies** and **150 financial firms** on **tropical forests**, focusing on their policies regarding key commodities linked to deforestation.

Report findings:

- Despite **ten years of monitoring**, voluntary efforts by the industry to address this issue have been deemed a failure.
- The report highlights the **increasing awareness of the role of human activities**, such as **cattle farming** and **palm oil plantations**, in threatening the world's forests, which are **vital in combating climate change and biodiversity loss.**
- Although nearly **200 countries** supported the **goal of halting and reversing deforestation by 2030** at last year's **COP28 climate talks**, the **Forest 500 analysis** by **Global Canopy** reveals that significant action is still lacking.
- **Out of 257 companies and financial institutions** monitored over the past decade, **23% have not made any commitment to addressing deforestation.**
- The study emphasizes the necessity for regulatory action over voluntary measures to ensure **deforestation-free, conversion-free, and human rights abuse-free supply chains.**
- While welcoming new **EU deforestation legislation**, **Global Canopy** urges further action and faster legislation efforts from the **US** and **Britain**, noting that **only 1% of firms analyzed are on track to comply with the EU's new rules.**

Public pressure:

- The latest report reveals that **37% (187 entities)** of **companies and financial institutions** analyzed **lack a publicly available commitment to combating deforestation**, showing a **slight improvement from 40% last year.**
- It identifies **JPMorgan Chase, Bank of America, and Mitsubishi UFJ Financial** as the top financial institutions funding **companies without deforestation commitments.**
- Among the **246 companies** that have made at least one commitment to address deforestation, about **63% have failed to provide adequate evidence** of their actions aligning with their stated intentions.

- There is a disparity in focus, with efforts to address deforestation from **palm oil receiving more attention than the cattle sector**, which is identified as the **largest driver of tropical deforestation**.

Topic 31. UNEA-6: OVER A THIRD OF GLOBAL POPULATION LIVING WITH SOLID WASTE, REVEALS REPORT

Important for the subject: Environment

Report title: Turning rubbish into a resource: Global Waste Management Outlook 2024 (GWMO 2024)

- **Published by:** UNEP
- **Presented during:** The Sixth United Nations Environmental Assembly (UNEA-6) in Nairobi.

Key points from the report on global waste management:

- Over a **third of the world's population**, approximately **2.7 billion people**, primarily in the **Global South** and **developing regions**, **lack access to waste collection services**.
- Of these, **2 billion** reside in **rural areas**, while **700,000** are in **urban settings**.
- The report reveals that **around 540 million tonnes of municipal solid waste**, representing **27% of the global total**, are **not collected**.
- Collection rates are particularly **low in Sub-Saharan Africa and Central and South Asia**, with **only 36% and 37% of waste being collected**, respectively.
- In contrast, **developed and upper-middle-income regions** have **much higher waste collection rates**, ranging from **83% in the Caribbean** to **99% in North America**, compared to the **global average of 75%**.
- The report projects a significant increase in global waste generation from **2.3 billion tonnes in 2023** to **3.8 billion tonnes by 2050**, exacerbating the challenge of waste management.
- The **direct global cost of waste management in 2020** was estimated at **\$252 billion**, with the **cost rising to \$361 billion** when including the **hidden expenses** related to **pollution, health issues, and climate change** due to inadequate waste disposal practices.
- The report warns that **without urgent action on waste management**, the **global annual cost could nearly double by 2050**, reaching **\$640.3 billion**. However, **effective waste management** could significantly **reduce** these costs to **\$270.2 billion annually by 2050**.

- It highlights the potential of **adopting a circular economy model** to not only mitigate waste generation but also to achieve a **net gain of \$108.5 billion per year**.
- **No country has yet successfully separated development from waste generation**, emphasizing the ongoing threat waste poses to ecosystems and its contribution to climate change, with the threat expected to **double by 2050**.

Topic 32. EUROPEAN PARLIAMENT ADOPTS NATURE RESTORATION LAW

Important for the subject: Environment

On February 27, 2024, the **European Parliament** adopted the EU's **first law** aimed at **restoring degraded ecosystems** across its **27 member states**.

About 'EU Deforestation law (EU- DR):

- The legislation **mandates restoring at least 20% of the EU's land and sea areas by 2030**, with a **goal to restore all ecosystems** in need by **2050**.
- Specific targets include **restoring 30% of drained peatland by 2030**, increasing to **50% by 2050**.
- For **agricultural ecosystems**, EU countries **must improve in two of three indicators** related to **biodiversity** and also **take measures to increase the common farmland bird index**.
- Exceptional circumstances may allow for the **suspension of agricultural ecosystem targets to ensure sufficient food production**.
- The law also sets goals for **forest ecosystems**, including **planting three billion trees**, **restoring 25,000 km of rivers to a free-flowing state**, and **maintaining urban green spaces and tree canopy cover**.
- The adoption followed a vote with 329 in favor, 275 against, and 24 abstentions. This law, **first introduced by the European Commission** on June 22, 2022, **faced initial challenges**, including **rejection** by the **ENVI committee** in June 2023, but has now moved to the **European Council** for adoption before becoming effective.

Topic 33. ARE INTERPOL'S NOTICES BEING POLITICALLY EXPLOITED?

Important for the subject: International Relations



The **International Criminal Police Organization (Interpol)** comprises **194** member countries was established in **1923**.

- It does not work under UN.
- It has enjoyed a special role—that of **Permanent Observer** at the United Nations – since 1996.
- It is headquartered at **Lyon, France**.

Role:

- As an **information-sharing network** to enable national police forces to **combat transnational crimes**.



Four Global Programmes of Interpol:



What are the concerns:

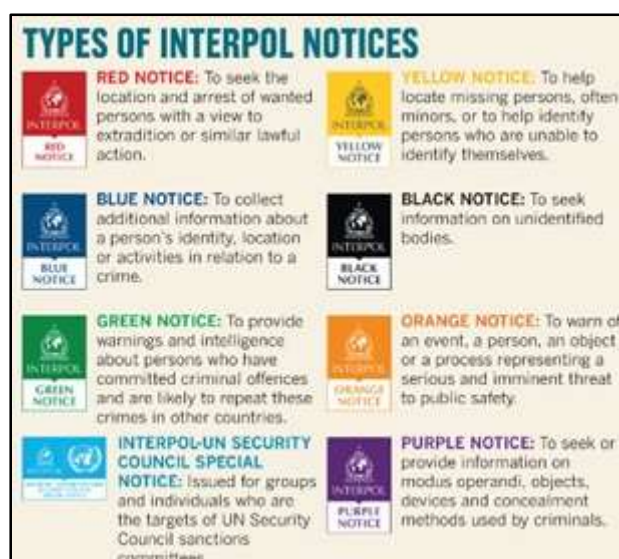
- About the **misuse of Interpol's notice system**, especially the issuance of blue corner notices (less scrutinised than their red corner notices).

Critics argument:

- Countries often exploit existing protocols to **target political refugees and dissidents**.
- While efforts have been made to address this.
- But still questions remain about **striking a balance** between **facilitating police cooperation** and **preventing misuse** of this powerful tool.

What is a “blue corner” notice?

- There are **seven** types of notices issued by Interpol — Red Notice, Yellow Notice, Blue Notice, Black Notice, Green Notice, Orange Notice, and Purple Notice.



- A **blue corner notice** (or an “**enquiry notice**”) allows police forces in member states to **share critical crime-related information** such as obtaining a person’s criminal record, and location and, having his or her identity verified among others.
- Example: In January 2020, Interpol issued a blue corner notice to help locate **fugitive self-styled godman Nithyananda**.

How does “blue corner” notice differ from a “red corner” notice?

What is a red corner notice?

- A red corner notice is issued by a member state to **arrest a wanted criminal through extradition or any other similar lawful action**.
- Such notices are issued against persons **wanted by national jurisdictions** for **prosecution** or **to serve a sentence** based on an arrest warrant or a court decision. The country issuing the request **need not be the home country of the fugitive**.
- Interpol acts even on the request of a country **where the alleged crime has been committed**.

Differences:

- While blue corner notices are issued **prior to the filing** of criminal charges, red corner notices generally **follow criminal convictions**.

Impact of notices:

- The concerned individual can be stopped and arrested while travelling through a member state.
- There will also be other detrimental consequences such as the closure of bank accounts.

Discretionary in nature:

- However, **Interpol cannot compel** law enforcement authorities in any country to arrest the subject of a red corner notice as the exercise of such powers is **entirely discretionary**.

Case study:

- In 2018, a red corner notice was issued against **fugitive billionaire Nirav Modi** in relation to **the Punjab National Bank scam**.
- However, in October 2022, **Interpol rejected a second request** by India to issue such a notice against **Gurpatwant Singh Pannun**, whom the Union Ministry of Home Affairs has listed as a “**terrorist**.”

Reason by Interpol:

- India has failed to provide sufficient information to support its case and that his **activities have a “clear political dimension.”**

Is the notice system prone to misuse?

- **Rule:** Interpol's Constitution explicitly **forbids any** activities of a **political character**

However, Interpol failed to enforce the above rule as highlighted below:

As accusation by activists:

- It is directed at **Russia**, which has repeatedly **issued notices and diffusions** for **the arrest of Kremlin opponents**, a political character activity .
- Data: According to the U.S. rights organisation Freedom House, Russia is responsible for **38% of all public red notices**.
- **Accusation by International human rights groups:**
- Against **China, Iran, Turkey, and Tunisia etc.** of abusing the agency's notice system for **authoritarian ends** i.e. again a political character activity.

Response of accusation by Interpol:

- Interpol **toughened the oversight of its red** notice system.

Still vulnerabilities remain:

- According to experts vulnerabilities remain in **Blue notices issuances**.
- **Reason:** Blue notices are **less likely to be reviewed before publication**.
- **Impact:** As per the agency's data that blue notices have **roughly doubled in number** over the past decade.

Reaction of countries :

- But countries like **Turkey** argue that such restraint in the issuance of notices **hampers police cooperation** and that **the West should not interfere with their internal affairs**.

Topic 34. IS THE UKRAINE WAR CHANGING WORLD ORDER?

Important for the subject: International Relations



Affected areas map:

Introduction:

Russia's war in Ukraine has turned out to be the largest land war in Europe since the end of the Second World War.

- The war has pushed Russia to turn towards Asia and the Global South in general, while the West continues to support Ukraine in its bid to push back and weaken Russia.
- A vast majority of countries, including India, remain neutral as the violence continues.

Did Vladimir Putin err?

- **Defence experts and western intelligence thought:**
- President Vladimir Putin made a grave **strategic miscalculation** when he ordered the invasion of Europe's second largest country (after Russia), also a close ally of NATO, with less than 2,00,000 troops.
- Putin **probably expected a quick victory**, like he did in **Georgia in 2008 and Crimea in 2014**.

What actually occurred:

- But as **the Russian war machine got stuck in Ukraine**, the West moved in with military assistance, training and international mercenaries. After his troops were forced to pull back from Kharkiv in 2022, Mr. Putin immediately ordered **a partial mobilisation**.

Shifting Russian Focus:

- The focus of Russia's military campaign shifted from **all out offence** to **strengthening the lines of defence with limited offensive battles**.
- When Ukraine was preparing for a major counteroffensive, Russia kept thousands of Ukrainian troops engaged at Bakhmut in Donetsk, while at the same time **building defence fortifications along the 1,000-km long frontline**.
- Last May, the Russians took Bakhmut.

Where does the war stand now?

Ukrainian side :

- **Eight months after Ukraine's counteroffensive began**, it's now evident that **the campaign failed**, as admitted by Gen. Valerii Zaluzhnyi, the commander of Ukrainian forces, who was fired by President Volodymyr Zelenskyy earlier this month.
- Gen. Zaluzhnyi had called for a **mass mobilisation**, suggesting that Ukraine was facing **acute shortage of fighters on the frontline**.
- They **lost** many of their **West-supplied weapons** in the counteroffensive and are **waiting for fresh supplies**, but **aid from the U.S. is stuck in Congress amid Republican opposition**.

Russian side:

- The Russians are on the offensive. In December, Russia claimed its first victory **since the fall of Bakhmut** when it captured Maryinka, in Donetsk.
- This month, Ukraine was forced to abandon **Avdiivka**, a **strategically important town in Donetsk**, after months-long fighting and suffering huge losses.
- The Russians are **now advancing westward in Donetsk** and **piling up pressure on Ukrainian forces in Krynky, Kherson, in the south**.

What is the West's strategy?

- The West had taken a **two-fold approach towards Ukraine**.
- To provide **economic and military assistance to Kyiv** to keep the fight against Russia going on: With Ukraine's **failed counter-offensive** and a **changing political climate in Washington** with the prospect of a second Trump presidency looming, **this policy faces uncertainty**, if not absolute peril.

- To weaken **Russia's economy and war machine through sanctions**. : Sanctions, has hurt Russia badly. According to West, sanctions have **deprived Russia of over \$430 billion in revenue** it would otherwise have gained since the war began.

How have the sanctions affected Russia?

- Russia has found **several ways to work around sanctions** and **keep its economy going**.
- When **Europe cut** energy sales, Russia offered **discounted crude oil** to **big growing economies** such as **China, India and Brazil**.
- It amassed a **ghost fleet of ships** to keep **sending oil to its new markets** without relying on **western shipping companies and insurers**.
- It set up **shell companies and private corporations** operating in its **neighbourhood (Armenia or Turkey)** to import **dual use technologies** which were **re-exported to Russia** to be used in **defence production**.
- **China**, the world's second largest economy, **ramped up its financial and trade ties with Russia**, including the export of dual use technologies.
- **Russia** moved away from the **dollar** to other currencies, mainly the **Chinese yuan**, for **trade** and boosted **defence and public spending at home** (its defence budget was **raised by nearly 70%** this year).
- Russia **strengthened ties with Iran and North Korea**, reeling under **American sanctions** and **imported weapons** from them, ranging from **drones to cruise missiles and ammunition**.

Russian estimates:

- Russia earned \$15.6 billion from its oil exports alone in January, up from \$11.8 billion last summer, according to the International Energy Agency. The Russian Defence Ministry claims that it manufactured 1,530 tanks and 2,518 armoured vehicles in 2023.

Present status:

- Two years after the war started, despite sanctions, both **Russia's energy industry and its military industrial complex remain vibrant**.

How is the war transforming Russia?

Externally:

- Since the war began, two countries in its neighbourhood, **Sweden and Finland, have joined NATO**: expanding the alliance's border with Russia.
- Putin spent years **to build strong economic ties with Europe**, which are now in tatters.
- Russia's hold on its immediate neighbourhood is **loosening** evident in **tensions with Armenia** and **Armenia's** decision to freeze participation in the **Moscow-led Collective Security Treaty Organization (CSTO)**.

The Collective Security Treaty Organization (CSTO):

- It is an **intergovernmental military alliance** in **Eurasia** consisting of **five post-Soviet states: Belarus, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan, formed in 2002**.
- The Collective Security Treaty has **its origins in the Soviet Armed Forces**, which was replaced in **1992 by the United Armed Forces of the Commonwealth of Independent States**, and was replaced by the **successor armed forces of the respective independent states**.
- Russia is also **becoming dependent on China**; the Kremlin is careful **not to upset the sensitivity of New Delhi**.

Internally:

- The Russian state is **tightening its control over society** and is **clamping down** on any criticism of the war.

Incidents:

- **The Prigozhin rebellion** of last year exposed **chinks in the armour of the state** Putin has built.
- The death of **Alexei Navalny**, the most vocal critic of President Putin in Russia, in a remote Arctic prison **endorses criticism of the way Russia handles dissent**.
- **If post-Soviet Russia appeared to be a "managed democracy", post-war Russia is sliding into a tightly held authoritarian state**.

What does it mean for the world?

- **The Western strategy** of empowering Ukraine through aid and weakening Russia through sanctions **doesn't seem to have worked**.
- The war has also **exposed the limits of Western power in a changing world** — for sanctions to be effective, **the trans-Atlantic alliance needs the support of other major economies such as China and India**.

- While Russia has constantly found ways to work around sanctions, it has also suffered huge casualties and will have to fight the long term effects of the sanctions. If there is one power unscathed by this chaos, it is China.
- When Beijing sees conflict from both the West and Russia stuck in Ukraine, forcing China to pivot to Asia, redrawing the global balance of power.

Topic 35. G-33 MINISTERIAL STATEMENT ON AGRICULTURE TRADE NEGOTIATIONS AT THE 13TH WTO MINISTERIAL CONFERENCE G-33 MINISTERIAL MEETING, ABU DHABI, 25 FEBRUARY 2024

Important for the subject: International Relations



Ministers and Representatives of the **G-33 Members, met in Abu Dhabi, the United Arab Emirates, on 25 February 2024**, on the sideline of the 13th WTO Ministerial Conference.

- The 13th WTO Ministerial Conference aimed to exchange views on the state of play of the WTO agriculture trade negotiations, and to deliberate the Group's priorities on the outcome and the way forward.

Key Outcomes:

- Emphasis was made on the **13th WTO Ministerial Conference** which provides an important opportunity to reinforce a rules-based, non-discriminatory, open, fair, inclusive, equitable, and transparent multilateral trading system with the WTO at its core.
- **The vast majority of the G-33 Members recognize** the critical importance of public stockholding for food security purposes for developing country Members, **including LDCs and NFIDCs**, in meeting our food and livelihood security, as well as our rural development imperative, including supporting low income or resource poor producers.

About World Trade Organization (WTO)

- The WTO is an **intergovernmental organization** that is concerned with the regulation of international trade between nations.

- The WTO officially commenced on **1 January 1995** under the **Marrakesh Agreement**, signed by 123 nations on 15 April 1994.
- It replaced the **General Agreement on Tariffs and Trade (GATT)**, which commenced in **1948**.
- It is the **largest international economic organization in the world**.

Functions of WTO

- The WTO deals with the **regulation of trade in goods, services and intellectual property between participating countries**.
- It provides a framework for **negotiating trade agreements and a dispute resolution process** aimed at enforcing participants' adherence to WTO agreements, which are signed by representatives of member governments and ratified by their parliaments.

Principles of WTO:

- Five principles are of particular importance in understanding both the pre-1994 GATT and the WTO:

Non-discrimination:

- It has two major components: the most favored nation (MFN) rule and the national treatment policy.
- The MFN rule requires that a WTO member must apply the same conditions on all trade with other WTO members.
- National treatment means that imported goods should be treated no less favorably than domestically produced goods.

Reciprocity:

- It reflects both a desire to limit the scope of free-riding that may arise because of the MFN rule and a desire to obtain better access to foreign markets.

Binding and enforceable commitments:

- The tariff commitments made by WTO members in multilateral trade negotiation and on accession are enumerated in a schedule (list) of concessions.
- These schedules establish "ceiling bindings": a country can change its bindings, but only after negotiating with its trading partners.

Transparency:



- The WTO members are required to publish their trade regulations, to maintain institutions allowing for the review of administrative decisions affecting trade, to respond to requests for information by other members, and to notify changes in trade policies to the WTO.

Safety values:

- In specific circumstances, governments are able to restrict trade.
- The WTO's agreements permit members to take measures to protect not only the environment but also public health, animal health and plant health.

Topic 36. RECORD DROP IN SUEZ CANAL TRANSITS DUE TO HOUTHIS' ATTACKS

Important for the subject: International Relations



Who are Houthis?

The Houthis are an Iranian-backed, Shiite Muslim armed religious and political movement in Yemen.

Recent activities of Houthis

- Houthis attacked ships traversing the Red Sea in solidarity with the Palestinians caught in the Hamas-Israel war.

Impact of Houthis' attack:

- It disrupted trade through the critical waterway that connects Asia and Europe. (**Suez Canal**)
- Companies are re-routing ships to avoid the Suez Canal and opting for the longer route (8900 km more) around the **Cape of Good Hope**, the **southern tip of Africa**.

Recent route shift:

- As per UNCTAD report, Suez Canal handled 12%-15% of global trade in 2023.
- But since attack, container tonnage crossing the canal fell by 82% this year.
- While container tonnage passing around the Cape of Good Hope increased by 60% and about 621 container ships were rerouted around the Cape of Good Hope.

Disruption in Panama Canal:

- The Panama Canal is under stress due to low water levels due to drought.
- Disruption in Red Sea also come at this time.

What is Suez Canal:

- The Suez Canal was established in 1896 is 120 miles long from the city of Port Said (Mediterranean Sea) in the north to the city of Suez (Egypt, Red sea , Indian Ocean) in the south.
- It separates the African continent from the Sinai Peninsula.

Importance:

- It is a crucial international shipping route, allowing vessels to navigate between Europe and Asia without having to circumnavigate the African continent.

What is Cape of Good Hope:

- The Cape of Good Hope is a rocky headland on the Atlantic coast of the Cape Peninsula in South Africa
- It joins Eastern Asia and Europe to southern parts of Africa.

What is Panama canal?

- The Panama Canal is an artificial 82-kilometre waterway in Panama that connects the Atlantic Ocean with the Pacific Ocean, cutting across the Isthmus of Panama, and is a conduit for maritime trade.

Analysis of recent happenings:

- Monthly transits went down by more than 40% in the Suez Canal only recently due to attack and by 50% in the Panama Canal due to drought in last two years compared to their peak.
- Attack led to re-routing from **Suez Canal to Cape of Good Hope** that increased the distance travelled.
- An oil tanker starting from the port of Ras Tanura in Saudi Arabia to Rotterdam in the Netherlands will have to travel 10,358 km through the Suez Canal route. The alternative journey around the Cape of Good Hope is 17,975 km.

- This means that the Suez Canal cut the distance by 42%.
- Also, according to **UNCTAD report**, today there is no ideal alternative to the Suez Canal, especially for **Asia–Europe and Asia–North Africa trade**.
- The extra distance travelled led to higher shipping costs. Container freight rates for Asia-Pacific to Europe routes have increased.

Impact on India:

India is also impacted by such attacks in following manner:

- **Russia** — the source of most of India's oil — sends its oil containers through the Suez Canal. As of now, domestic fuel prices have not impacted.
- India's petroleum products export to European countries, especially the Netherlands is also through the **Suez Canal route**.
- Other routes increase export cost making it unviable.

Topic 37. AFRICAN LEADERS DEMAND FINANCIAL SYSTEMS REFORM; LAUNCH 'AFRICA CLUB' AT 37TH AFRICAN UNION SUMMIT

Important for the subject: International Relations

The **37th African Union Summit** concluded on February 18, 2024, in **Addis Ababa, Ethiopia**, with discussions among heads of state and government members on key issues like **education, climate change**, and the **economy**.

- Despite **Africa's minimal contribution to the global climate crisis**, the **continent faces significant adverse effects from climate change**.
- **African nations** have been diverting public funds to mitigate these impacts, often at the expense of other critical areas such as achieving the **Sustainable Development Goals (SDG)** set by the **United Nations**.
- The summit highlighted the **growing need for improved access to quality financing for climate and development initiatives in developing countries**.
- This includes calls for **reforms in the global financial system** to better meet the financing needs of these countries, emphasizing the importance of adjusting the interconnections among international financial institutions, economic governance, and financial regulatory frameworks.
- The **AU** is the **most recent recipient** of '**full member status**' to the **Group of 20 (G20)**, pointing to the **continent's growing voice on the global stage**.
- The proposals at the **AU Summit** underscored the **bloc's vision** for addressing economic frameworks that no longer serve their interests and needs.

Key highlights related to financial system reforms from the AU summit:

Initiatives	Description
Launch of Alliance of African Multilateral Financial Institutions, 'Africa Club'	<ul style="list-style-type: none"> • This alliance, comprised of African-owned and controlled financial institutions, aims to enhance Africa's role in the global financial system. • It intends to align its operations with the Sustainable Development Goals (SDGs) and the African Union's Agenda 2063, introduce innovative financial solutions, facilitate debt management discussions, and promote collaboration to meet the unique financial needs of African nations. • Members of the 'Africa Club' include prominent institutions like the African Export-Import Bank, Trade and Development Bank, Africa Finance Corporation, African Reinsurance Corporation, African Trade and Investment Development Insurance, Shelter Afrique Development Bank, and ZEP- RE (PTA Reinsurance Co).
Establishing African Union Financial Institutions	<ul style="list-style-type: none"> • At the 37th African Union (AU) Summit, leaders from the continent reiterated the longstanding need for establishing an African Monetary Union. • This ambition is proposed to be realized through the creation of three key AU financial institutions: The African Central Bank, the African Monetary Fund, and the African Investment Bank.

	<ul style="list-style-type: none"> • Additionally, there has been discussion on assessing the feasibility of creating a Pan-African Stock Exchange. • Despite the potential benefits these institutions could offer, their establishment has faced significant challenges over time.
African leaders' demands for financial system reforms	<ul style="list-style-type: none"> • In recent years, including in 2023, African Union (AU) member leaders have emphasized the need for reforms in the global financial system to correct structural imbalances. • Prior to the 2024 AU Summit, these demands were summarized, highlighting several key areas for improvement. African leaders are calling for solutions to the continent's debt crisis, an increase in grants and concessional funding to Africa, and the rechanneling of Special Drawing Rights (SDR) issued by the International Monetary Fund (IMF) to African financial institutions. • Additionally, they seek to enhance Africa's influence and participation in global decision-making bodies and commit to an ambitious agenda for green growth across the continent. • These demands align with initiatives like the Nairobi Declaration and the priorities of the Vulnerable 20 group of countries, aiming to improve finance access and quality for the Global South.
Joint taskforce on international taxation	<ul style="list-style-type: none"> • Launched at COP28, Dubai, UAE • Launched jointly by- Antigua and Barbuda, Barbados, France, Kenya,

	<p>Spain, and the African Union Commission, with the European Commission as an observer.</p> <ul style="list-style-type: none"> • It is intended to ensure that all economic sectors, particularly those with a low tax burden, contribute a fair share to climate financing according to respective greenhouse gas emission levels. • The taskforce is the result of discussions initiated at the June 2023 Paris Summit for a New Financing Pact and the September 2023 African Climate Summit, held in Nairobi.
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Topic 38. WTO NEGOTIATION SESSION ON FISHERIES SUBSIDIES

Important for the subject: International Relations



The **WTO negotiation session on Fisheries Subsidies** took place on 27 February in the ongoing Abu Dhabi Ministerial Conference-13.

- **In these negotiations, India reiterated its long-held positions** that responsible and sustainable fisheries is a practice ingrained in the ethos and practices of India's large and varied fishing community.

India's Opinion:

- India stressed that historically, **while subsidies to the fisheries sector has led to over exploitation**, subsidies are also vital for developing countries and small economies to develop and diversify their fisheries sector as well as to protect the food security and livelihood security of their fishermen.

- This negotiation is linked to the concept of sustainability and as such, any comprehensive agreement on fisheries subsidies should be built on the principles of **Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC)**.
- It should also incorporate the provisions of **Special and Differential Treatment (S&DT)** appropriately, as is the case for all WTO agreements.
- There is an urgent case for capturing non-specific fuel subsidies and transfer of fishing rights to corporate fishing under **Government to Government (G2G) payments** within the ambit of the disciplines.
- Equally important is the need to discipline subsidies given by the Distant Water Fishing Nations as proposed by India.
- India explained that the current approaches for addressing **Over Capacity and Over Fishing (OCOF)** is deeply flawed.
- **Agreement on Fisheries Subsidies**
- The **WTO Agreement on Fisheries Subsidies** was adopted at the 12th Ministerial Conference (MC12) on 17 June 2022.
- It marks a **major step forward for ocean sustainability by prohibiting harmful fisheries subsidies, which are a key factor in the widespread depletion of the world's fish stocks.**

The Agreement represents a historic achievement for the membership as the

- the **first Sustainable Development Goal (SDG)** target to be fully met through a multilateral agreement,
- the **first WTO agreement to focus on the environment,**
- the **first broad, binding, multilateral agreement on ocean sustainability,** and
- only the **second agreement reached at the WTO since its inception.**

Topic 39. GREEN WATERWAY INITIATIVES

Important for the subject: Schemes



Prime Minister Narendra Modi inaugurates various **Green Waterway Initiatives in Varanasi, Marks Milestone in Clean Energy and Tourism.**

- PM Modi dedicates two hybrid electric catamaran vessels to nation built by **CSL through IWAI under Ministry of Ports, Shipping and Waterways**
- Vessels have seating capacity of **50 passengers each, are powered by fast-charging batteries and are designed to reduce carbon emissions by 400 MT annually**
- The PM inaugurated **four community jetties in Varanasi and laid the foundation stone for 13 community jetties along NW 1 in Varanasi and NW 110 in Mathura and Prayagraj.**
- The **Quick Pontoon Opening Mechanism System** inaugurated today will reduce time from six hours to 30 minutes.
- MoPSW aims to boost the share of **Inland Water Transport (IWT) to 5% by 2030 as part of the Maritime India Vision (MIV)**, signaling a comprehensive effort towards fostering maritime sector growth and connectivity enhancement.

About Hybrid electric catamaran vessels:

- The two hybrid electric catamaran vessels ie MV Guh and MV Nishadraj are built by Cochin Shipyard Limited (CSL) through Inland Waterways Authority of India (IWAI) under the Ministry of Ports, Shipping and Waterways (MoPSW).
- MV Guh will sail on the River Saryu in Ayodhya, and MV Nishadraj on the River Ganga in Varanasi.
- These state-of-the-art vessels, with a seating capacity of 50 passengers each, are powered by fast-charging batteries and are designed to reduce carbon emissions by 400 MT annually.

About Harit Nauka Guidelines:

- The Government of India also aims to foster the confidence of the stakeholders in the maritime sector and usher them towards transitioning to greener and cleaner fuels as emphasized under the Harit Nauka- Inland Vessels Green Transition Guidelines, published on 8th January 2024.
- The **Harit Nauka Guidelines** shows **MoPSW's** commitment to transform the maritime landscape by adopting green vessels & establishing operationalization of the green ecosystem.
- It also **aims to embrace low/zero emission sources of fuel & attain 100% green vessels in the Indian waters by 2047.**

About Jal Marg Vikas Project (JMVP):

- The **Jal Marg Vikas Project (JMVP)** being implemented by the **Inland Waterways Authority of India** aims to **improve the navigability of the 1390 km** stretch of NW1 from Varanasi in Uttar Pradesh to Haldia in West Bengal

About Quick Pontoon Opening Mechanism System (QPOMS):

- The **QPOMS** will help in **reducing the time for the manual dismantling and reassembly of the kulfi pontoon bridges across NW-1 in a quick and efficient manner.**

Topic 40. SECI UNVEILS INDIA'S LARGEST SOLAR-BATTERY PROJECT, PIONEERING RENEWABLE ENERGY INNOVATION IN CHHATTISGARH

Important for the subject: Schemes



The Solar Energy Corporation of India Limited (SECI), under the aegis of the Ministry of New and Renewable Energy, has successfully commissioned India's largest Battery Energy Storage System (BESS), which stores energy using solar energy.

- The 40 megawatts (MW) / 120MWh BESS with a solar photovoltaic (PV) plant which has an installed capacity of 152.325 megawatt hour (MWh) and dispatchable capacity of 100MW AC (155.02 MW peak DC) is located in Rajnandgaon, Chhattisgarh.
- The project has been constructed with funding from the **World Bank and Clean Technology Fund under Innovation in Solar Power & Hybrid Technologies Project** as well as leveraged financing from domestic lending agencies.
- The energy would be purchased by the **state of Chhattisgarh**, thus contributing to meeting the peak energy demand of the state using green electrons and also towards its renewable purchase obligations.



About the project:

- The project using solar panels and battery storage represents a **monumental leap forward in generation and use of renewable energy.**
- The project utilizes battery storage for storing solar energy when the sun is shining and using it later **during hours of peak demand in the evening, for meeting the electricity demand in the state.**
- The project has **deployed bifacial modules**, which reflect the light from the ground, thus generating more electricity than monofacial modules, hence setting a new standard for large-scale renewable energy projects.
- A unique aspect of this project is its **strategic use of previously unused land.**
- A tripartite land-use permission agreement among the Energy Department of the Government of Chhattisgarh, **Chhattisgarh State Power Distribution Company Limited (CSPDCL), and SECI, have been repurposed.**
- The project has thus adopted a **sustainable approach to energy project development, while minimizing environmental impact.**

Benefits of the project:

- This project is estimated to save tonnes of **carbon dioxide emissions annually.**
- This project is expected to have a far-reaching positive impact on the **renewable energy landscape** and in promoting responsible utilization of land resources in India and globally.

Topic 41. PM LAUNCHES THE WORLD 'S LARGEST AGRI STORAGE PLATFORM

Important for the subject: Schemes



Prime Minister Shri Narendra Modi inaugurated and laid the foundation stone of several major initiatives for the cooperative sector at Bharat Mandapam in New Delhi.

- The Prime Minister inaugurated the pilot project of **‘World’s Largest Grain Storage Scheme in Cooperative Sector’ in 11 Primary Agricultural Credit Societies (PACs) in 11 states.**
- PM Modi laid the foundation stone of additional **500 PACs across the country for creation of godowns and other agri-related infrastructure and also inaugurated a project for computerization of 18,000 PACs.**

World largest Grain Storage Plan:

- Prime Minister Shri Narendra Modi inaugurated the pilot project of **‘World’s Largest Grain Storage Scheme in Cooperative Sector’ in 11 Primary Agricultural Credit Societies (PACs) in 11 states.**
- Under the scheme, **thousands of warehouses and godowns will be constructed across the country.**
- The scheme aims to create storage capacity for **storing 100 per cent of India’s grain production.**
- It aims to seamlessly integrate **PACs godowns with the food grain supply chain, with a collaborative effort of NABARD and spearheaded by the National Cooperative Development Corporation (NCDC).**
- The initiative is being implemented through the convergence of various existing schemes like the **Agriculture Infrastructure Fund (AIF), Agriculture Marketing Infrastructure (AMI), etc.** to enable PACs participating in the project to avail subsidies and interest subvention benefits for undertaking infrastructure development.
- PM also laid the foundation for **creating godowns and other agri infrastructure in 500 more PACs.**
- The PM also inaugurated a project for computerisation of **18,000 PACs across the country.**
- In India, storage capacity with regards to food grain production is **only 47%, whereas in the USA it is 161%, Brazil 149%, Canada 130% and China 107%.**
- 700 lakh tonne storage capacity will be created in the next five years, with an investment of ₹1.25 lakh crore.

About PACS

- Primary Agricultural Credit Societies are the grass root level arms of the short-term co-operative credit structure.

- PACS deals directly with the rural (agricultural) borrowers, give those loans and collect repayments of loans given and also undertake distribution and marketing functions.

Organizational Structure of PACS

- **General Body of PACS:** Exercise the control over board as well as management.
- **Management Committee:** Elected by the general body to perform the work as prescribed by the society's rules, acts, and by-laws.
- **Chairman, Vice-Chairman, and Secretary:** Work for the benefit of the members by performing their roles and duties as assigned to them.
- **Office Staff:** Responsible for performing day to day work.

Significance of Primary Agriculture Credit Society

- For the uninitiated, a **PACS is the first building block** of the century-old cooperative banking system of India.
- PACS can play a colossal role, in bringing farmer communities closer to credit, inputs, market and value addition.
- **No commercial bank branch can ever come close to providing the kind of services a Primary Agriculture Credit Society (PACS) can.**
- PACS can also play a major role by integrating its warehouse with the physical and financial supply chain of agro-commodities in the upcoming Garmin Agriculture Markets (GrAMs) or large warehouses in the private sector.
- Promotion of training and awareness through **National Council for Cooperative Training (NCCT)**.
- By increasing its reach, **NCCT has conducted 3,287 training programs and provided training to 2,01,507 participants in FY 2022-23.**

Computerization of Agriculture and Rural Development Banks (ARDBs):

- To strengthen the long-term cooperative credit structure, the project of computerization of 1,851 units of **Agriculture and Rural Development Banks (ARDBs)** spread across 13 States/ Union Territories has been approved by the Government.
- **NABARD is the implementing agency** for the project and will develop a national level software for ARDBs.

Multi-State Co-operative Societies (Amendment) Act, 2023:

- Amendment has been brought in the **MSCS Act, 2002 to strengthen governance, enhance transparency, increase accountability, reform electoral processes and incorporate provisions of the 97th Constitutional Amendment in the Multi State Cooperative Societies.**

Topic 42. AYURVEDIC NUTRITION FOR ADOLESCENT GIRLS

Important for the subject: Schemes

A national event on collaboration between the **Ministry of Women and Child Development** and the **Ministry of Ayush** for nutritional improvement in adolescent girls took place at **Vigyan Bhavan, New Delhi** today (26 February, 2024).

- A **Memorandum of Understanding** was signed on the occasion for implementation of a project to control anemia among adolescent girls through Ayurvedic interventions in the five districts under ‘**Mission Utkarsh**’ between the **Ministry of Ayush** and the **Ministry of Women and Child Development**.
- The **Union Minister for Women and Child Development** announced that the **Ministry** will also take up a joint venture with **Ministry of Ayush** and **ICMR** for effective interventions like **Yoga in Polycystic Ovarian Disease (PCOD)** among adolescent girls

About Mission Utkarsh:

- Under this **Mission Utkarsh** program, over **94,000** adolescent girls between the age group of **14-18 years** registered under **Poshan Tracker** at approximately 10,000 Anganwadi Centres will be benefited in the 12 months period of the program
- The coordinating agency for the project will be the **Central Council for Research in Ayurvedic Sciences (CCRAS)**.
- **Classical Ayurveda medicines (Drakshavaleha and Punarnavadi mandoor)** for better nutrition to improve the health of the anemic adolescent girls will be provided for a period of 3 months.
- The districts to be covered include; **Dhubri, Bastar, Paschimi Singhbhum, Gadchiroli and Dhoulpur** from the states of **Assam, Chhattisgarh, Jharkhand, Maharashtra and Rajasthan** respectively.
- This project is being jointly funded by both the **Union Ministries** and will be executed in the five districts through **Central Ayurveda Research Institute, Guwahati; All India Institute for Ayurveda, New Delhi; CARI, Bhubaneshwar; Regional Ayurveda Research Institute, Nagpur and National Institute Ayurveda, Jaipur**.
- **Public Health Foundation of India’s IIPH, Delhi** will also play an important role by assessing the outcomes of this project.

Topic 43. INDIA-SPECIFIC AI MODEL TO AND GESTATIONAL AGE DEVELOPED

Important for the subject: Schemes

Researchers have developed an India-specific artificial intelligence model to precisely determine the gestational age of a foetus in the second and third trimester of pregnancy.

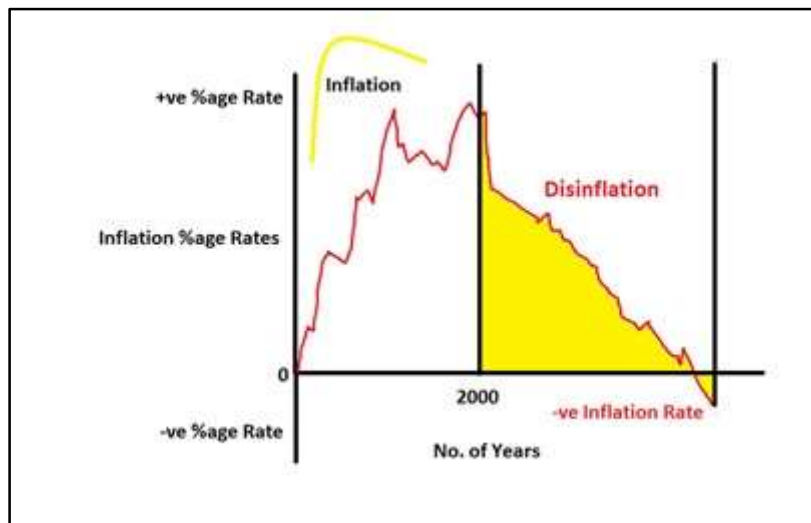
- **BRIC-THSTI Faridabad and IIT Madras** researchers have developed an **India-specific model** to determine the **age of a foetus in a pregnant woman in the second and third trimesters precisely**.
- The **Garbhini-GA2** is the first late-trimester GA estimation model to be developed and validated using Indian population data.
- **Currently**, the age of a foetus (**gestational age, GA**) is determined using a formula developed for **Western populations** and are likely to be **erroneous** when applied in the later part of pregnancy due to **variations in the growth of the foetus** in Indian population.
- The newly developed **second and third-trimester GA formula, Garbhini-GA2**, accurately estimates the **age of a foetus for the Indian population**, reducing error by **almost three times**.
- Accurate GA is necessary for the **appropriate care of pregnant women and for determining precise delivery dates**, thus **reducing maternal and infant mortality rates**.
- Technological advancements yield tangible benefits in the clinical realm lies in **the end-to-end partnership between clinicians and data scientists**.
- Such collaboration ensures that the development of solutions is not only **technically sound** but also **clinically relevant and seamlessly integrated** into healthcare workflows.

Why needed?

- Ultrasound dating in early pregnancy is the standard of care for determining GA. However a major proportion of women in India have their first ultrasound done in their second and third trimester of pregnancy.
- In these women, the application of Indian population-specific GA formulae, with better accuracy, can potentially improve pregnancy care leading to better outcomes.
- This accurate dating will also enhance the precision of epidemiological estimates for pregnancy outcomes in the country.
- Once validated in prospective pan-India cohorts, this Garbhini-GA2 can be deployed in clinics across India, improving the care delivered by obstetricians and neonatologists, thus reducing maternal and infant mortality rates in India.

Topic 44. JOB ON INFLATION FRONT NOT OVER, LAST MILE OF DISINFLATION CAN BE STICKY: DAS IN MPC MINUTES

Important for the subject: Economy

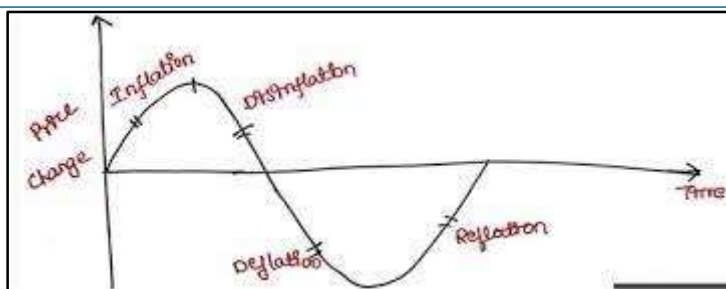


The **RBI Governor** wrote that the current setting of monetary policy is moving in the right direction, with growth holding firm and inflation trending down to the target.

- Most of the members believed that though **consumer price-based inflation (CPI)** has eased from the heightened levels seen last summer, uncertainty over food price remains a major concern for headline inflation.
- Of the six members of the rate-setting panel, **five voted to keep the repo rate unchanged at 6.5** per cent and to maintain a status quo on the policy stance of withdrawal of accommodation.
- Headline inflation rose from 4.9 per cent in October to 5.7 per cent in December, even as core inflation (CPI inflation excluding food and fuel) softened to a four-year low of 3.8 per cent.
- **Food price uncertainty remains a major source of volatility** for headline inflation outlook.

About Disinflation:

- Disinflation is a **situation of decrease in the rate of inflation over successive time periods**.
- It is simply the slowing of inflation.
- Central banks will fight disinflation by expanding its monetary policy and lowering interest rates.



About Headline Inflation:

- **Headline Inflation** refers to the complete inflation figure including all goods and services within the consumer price index basket.
- It encompasses all items, including those that are highly volatile, such as food and energy.

Topic 45. PAYMENTS BANKS MAY SEEK RBI NOD FOR SMALL-VALUE FIXED DEPOSITS

Important for the subject: Economy

Payments banks (PBs) may approach the Reserve Bank of India (RBI) to allow them to take **small-value fixed** as well as **recurring deposits**, in addition to these, also for **small-ticket loans** to **individuals and micro- and small enterprises (MSEs)**.

Reason:

- Garnering **low-cost savings bank (SB) deposits** is proving an uphill task given the **high-interest rates** being offered by commercial banks on **term deposits**.
- Small-ticket loans can **enhance their viability**.

Why scope of activities enhancement is needed:

- As five out of the 11 applicants who were given in-principal approval to start a PB in 2015, **either not commencing operations or voluntarily giving up their certificate of registration**.

PBs-vertically differentiated banks:

- Now, **only six PBs** — Airtel Payments Bank, Fino Payments Bank, India Post Payments Bank, Jio Payments Bank, NSDL Payments Bank, and Paytm PB — are operational.
- Out of these six, the RBI has imposed **severe restrictions on Paytm PB**.
- Due to “**persistent non-compliances**” and continued **material supervisory concerns** in the bank.
- **Fino PB** has applied to the RBI to convert into a **small finance bank**.

Current deposit scenarios:

- Commercial banks low-cost CASA (current account, savings account) **deposits have come down** over the last few quarters.
- **Reason** : As customers prefer investment in **fixed deposits, non-convertible debentures, mutual funds, equities**, etc.—**which offer better returns**.
- Given this situation, there is **no way PBs can stop the decline** in their savings bank (SB) deposits.

Solution:

- The way to stop deposit outflow is to allow us to **offer FDs and recurring deposits (RDs)**.
- Allow PBs to offer **small-ticket loans** in **select segments**, such as individuals and MSEs—which will fetch **a higher yield on advances** and will help in **servicing high-cost FDs and RDs**.

Structural solution: Up the cap

- These vertically differentiated banks (which are focused on small savings and payments/remittance services) **also want the RBI to increase the maximum end-of-day balance** a customer can maintain with them **from ₹2 lakh to ₹5 lakh** in sync with the **increase in deposit insurance cover**.

Significance of PBs:

- PBs provide **payments and remittance services** to the migrant labour workforce, low-income households, small businesses, other unorganised sector entities, and other users.

Other Features of PBs:

- These banks can **only accept demand deposits** (current account and savings bank account/CASA) with a **maximum balance of ₹2 lakh per individual customer**.
- They **cannot undertake lending activities** but **distribute financial products** like mutual fund units and insurance products, etc., and
- Act as **business correspondents of another bank**.

Current deposit status of PBs:

As per RBI Data-

- As of March 2023, the six operational PBs collectively had **deposits** (predominantly SB deposits) and **investments** (mostly in government securities) aggregating ₹12,174 crore (₹7,829 crore as of March 2022) and ₹12,064 crore (₹9,937 crore), respectively.
- **Five PBs were profitable** in 2022-23.

Topic 46. REAL INTEREST RATE OF 2% RISKS IMPAIRING GROWTH: MPC'S VARMA

Important for the subject: Economy

Interest rate concept:

Interest rates represent **the cost of borrowing or the return on saving**, expressed as a percentage of the total amount of a loan or investment.

Nominal Interest Rate = Real Interest Rate + Projected Rate of Inflation

- A **nominal interest rate** refers to the total of the real interest rate plus a projected rate of inflation.
- A **real interest rate** provides the actual return on a loan (to the lender) and on a bond (to the investor).
- Nominal interest rates can indicate **current market and economic conditions** while real interest rates represent **the purchasing power of investors**.

Context:

Varma at MPC:

- If the **potential growth rate** of the economy is close to **8%**, then the economy is not at risk of overheating in 2024-25.
- A real interest rate of **1-1.5%** would then be sufficient to glide inflation to the target of 4%.
- A real interest rate of 2% creates the **very real risk of turning growth pessimism** into a self-fulfilling prophecy.
- **Potential growth rate:**
- Potential growth is the rate of growth that an economy can sustain over the medium term without generating excess inflation.

Monetary policy committee (MPC):

- **Origin:** Under **Section 45ZB of the amended (in 2016) RBI Act, 1934**, central government is empowered to constitute a **six-member** Monetary Policy Committee (MPC).

- **Objective:** Further, Section 45ZB lays down that “the Monetary Policy Committee **shall determine the Policy Rate required to achieve the inflation target**”.
- The decision of the Monetary Policy Committee **shall be binding on the Bank**.
- **Composition:** Section 45ZB says the MPC shall consist of 6 members:
- RBI Governor as its ex officio chairperson
- Deputy Governor in charge of monetary policy
- An officer of the Bank to be nominated by the Central Board
- **Three persons** to be appointed by the central government.

Criteria:

- This category of appointments must be from persons of **ability, integrity and standing, having knowledge and experience in the field of economics or banking or finance or monetary policy**.

Dual objective of MPC :

- Inflation
- Growth

RBI Deputy Governor Michael Debabrata Patra said:

- Monetary policy must remain **restrictive** and maintain downward pressure on inflation while minimising the output costs of disinflation.
- **Private consumption**, which accounts for **57% of GDP**, is languishing under the strain of **still elevated food inflation** particularly in **rural areas**.
- **Inflation** has to be **restrained to its target** for growth to be **inclusive and sustained**.
- **The outlook** for the Indian economy remained **highly sensitive to inflation risks**: High inflation erodes purchasing power, especially for those least protected against the higher costs of essentials like food.
- It is only when inflation subsides and stays close to the target lastingly that policy restraint can be **eased**.
- **Restoring price stability is beneficial for all**.

Topic 47. PSBS CAN NOW CHECK ON BIG BORROWERS ON UNIFIED PORTAL

Important for the subject: Economy

Public sector banks (PSBs) would now be able to check the antecedents of large borrowers and ascertain the existence of any non-performing assets against their name in a single click.

- **Benefit:** a move that is expected to help expedite lending decisions.

Unified portal:

- According to The Indian Banks' Association – An “**Automated Search Portal**” was operationalised by the **Central Economic Intelligence Bureau (CEIB)** in collaboration with the **State Bank of India**.

Objective:

- For antecedent verification of prospective borrowers and NPAs [non performing assets]” to **streamline intelligence clearance process** for banks.

Features:

- Under the framework for **timely detection, reporting, investigation relating to large value bank frauds**, the **Department of Financial Services** under the Finance Ministry had **mandated all PSBs** to seek a report from the CEIB before sanctioning **loans exceeding ₹50 crore in the case** of new borrowers and if the existing borrower's accounts **turned into NPAs**.
- The Bureau, in tandem with SBI, has developed a digital platform that would help all public sector banks to obtain mandatory intelligence clearance from the CEIB in a **prompt manner**.
- **Importance:** To facilitate timely disbursement of funds.

Topic 48. INDIA'S STANCE ON DATA TRANSFERS AT WTO SPOOKS SEMICONDUCTOR INDUSTRY GIANTS

Important for the subject: Economy

A global consortium of semiconductor industry groups has asked India to **reconsider its plan** to push for **duties on cross-border digital e-commerce and data transfers** at an upcoming global trade meeting (WTO) in Abu Dhabi.

- Possible consequences: India's stance will stifle its own chip design industry.

- **Main Agendas at WTO meet:** Discuss several trade-related issues .Extending a moratorium in place since 1998 on applying duties on electronic transmissions.

Different perspectives on moratorium:

- Developing nations like India, South Africa and Indonesia are opposing moratorium.
- S. and Europe want to extend the moratorium.
- If no accord is made, the moratorium would expire this year.

World Semiconductor Council (WSC):

- The World Semiconductor Council (WSC) is an international forum that brings together industry leaders to address issues of global concern to the semiconductor industry.
- **Comprised of** the semiconductor industry associations (SIAs) of the United States, Korea, Japan, Europe, China and Chinese Taipei, such as Qualcomm, Intel, AMD and Nvidia.

Goal:

- To promote international cooperation in the semiconductor sector in order to facilitate the healthy growth of the industry from a long-term, global perspective.
- **According to the World Semiconductor Council (WSC) If the moratorium's collapse then:** Tariffs on digital e-commerce and an innumerable number of transfers of chip design data across countries will kick in .

Impact of tariff:

- Raising costs
- Worsens chip shortages

Importance of chip sector for India:

- The chip sector is a key plank to push India's economic growth, with a **\$10 billion incentive package** in place to boost the industry.

Impact on India:

- Duties on data transfers would “also **impede India's efforts to advance its semiconductor industry and attract semiconductor investment**, especially as more than 20% of the world's semiconductor design workforce is based in India.

Massive revenue loss:

According to New Delhi-

- Physical goods like books and videos, once governed by traditional tariff rules, were now available as digital services and should be subject to duties.
- Developing nations are facing massive loss in potential revenue with such imports from developed countries on the rise.

Implications of India's support to renew moratorium:

- India's support to renewing the moratorium will send a strong signal to semiconductor companies that **India is an investment friendly environment**.

Topic 49. IGNCA'S 'LANGUAGE ATLAS' TO SHINE A LIGHT ON INDIA'S LINGUISTIC DIVERSITY

Important for the subject: History

The **Indira Gandhi National Centre for the Arts (IGNCA)**, under the **Union Culture Ministry**, plans to conduct a **linguistic survey** to **enumerate the languages spoken across different states and regions**. This survey **aims** to provide **clarity on the number of active languages**.

- **India** is undertaking efforts to **promote education in the mother tongue**, particularly at the **primary level**, prompting questions about the actual number of **"active" languages** in the country.
- **India** officially recognizes **22 languages** listed in **Schedule 8** of the **Indian Constitution**, spoken by **97%** of the population according to **Census data**.
- Additionally, the **Census** includes **99 non-scheduled languages**, with approximately **37.8 million people** identifying one of these as their mother tongue.
- However, languages spoken by **fewer than 10,000 people** have been **excluded** from the **Census since 1971**, leaving the **native languages of 1.2 million people unaccounted for**.
- This decision disproportionately affects **tribal communities**, whose languages are often not included in official records.

Need for a 'Language Atlas':

- The **most comprehensive linguistic data** was collected in the **1961 Census**, which recorded languages spoken by even a single individual.



- There is a pressing need for a **new comprehensive linguistic survey** to create the **Language Atlas of India**.
- This **survey** would not only update the **current linguistic data** but also support future policy decisions.
- The **Detailed Project Report (DPR)** by the **IGNCA** lists several stakeholders for the survey, including **Ministries of Culture, Education, Tribal Affairs, Home, Social Justice and Empowerment, and Development of North East Region**, as well as various **language communities**.
- The **IGNCA** intends to collaborate with the **Central Institute of Indian Languages, the National Museum, Centres for Endangered Languages, and Linguistic Departments** of various universities to conduct the survey.

UNESCO Global Taskforce on Indigenous Languages:

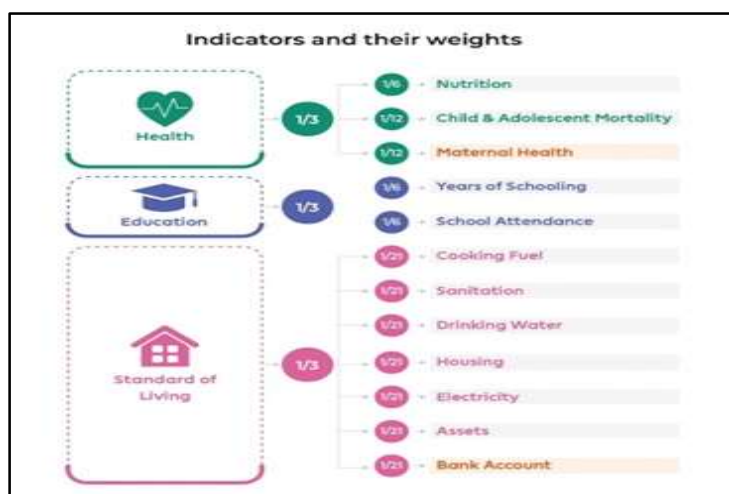
- For the organization of the **International Decade (2022- 2032)**, UNESCO established a **Global Task Force for Making a Decade of Action for Indigenous Languages**.
- The **Global Task Force** ensures that the **principles of inclusion, openness, participation and multi-stakeholder engagement** are respected and applied throughout the International Decade.

The mandate of the Global Task Force:

- As an international governance mechanism, the **Global Task Force** is established to **ensure the equitable participation of all stakeholders in the IDIL2022-2032** and to provide guidance on the preparation, planning, implementation and monitoring of activities, in line with the objectives of the Global Action Plan of the **IDIL2022-2032**.

Topic 50. POVERTY LEVELS BELOW 5%, CLAIMS CHIEF OF CENTRE'S THINK TANK

Important for the subject: History



Poverty Line:

A Poverty Line is defined as the **basic needs** that an individual requires to sustain his or her livelihood.

Above the poverty line (APL):

- A person who is able to earn enough money to cover his basic needs.

Below the poverty line (BPL):

- A person who is not able to earn enough money to cover his basic needs.

The Tendulkar Committee:

- According to this , a poverty level of **Rs 29 per person per day in urban areas** and **Rs 22 per person per day in rural areas**.
- According to **World Bank's** data on its **Poverty and Inequality Platform**, a new poverty line has been set at **15\$ per day**.

CEO of NITI Aayog's stand:**Based on findings of Household Consumption Expenditure Survey (HCES) for 2022-23:**

- Less than 5% are going to be below poverty line
- Retail inflation has been overstated
- Growth is broad-based with rural Indian's income and spending rising faster than Urban peers.
- Inequality is declining as Urban-rural consumption divided narrowed down from 91% in 2004-05 to 71% in 2022-23.
- Rural household's spending on food has dropped below 50% of total expenditure.
- Less than 5% of per capita consumer expenditure on pulses and cereals.
- Higher expenditure on conveyances, consumer durables and consumer durables.
- It indicates increase in earning of people and less spending on food.
- Thus, in not absolute but relative spending on food is declining while consumption of products like TV sets, fridges, mobile phones and cars etc. are increasing.
- It signifies change in income for betterment as well as change in lifestyle.

Based on Monthly per capita expenditure (MPCE) averages-

- The average consumption level for **the bottom 5% of rural households** was **₹1,373** and **₹1,782** for the next 5% of households. **Poverty lines and estimates are derived from this.**
- If we consider **₹32 a day** as poverty line in 2011-12 along with inflation for totalling to **₹60 a day**, thus poverty is **around or less than 10%.**
- As also (as per HCES) **₹1,782** is average spending in bottom 5 to 10% of fractile class in **rural India.**
- On addition of the imputed value of food transfers and subsidies received by households under schemes like the PM Garib Kalyan Anna Yojana or subsidised gas cylinders, poverty in India is certainly in **the low single digits (below 5%).**
- In addition to these, benefits like healthcare under the Ayushman Bharat scheme and free education **have not been factored into the consumption expenditure survey.**
- Also as per the **NITI Aayog's multi-dimensional poverty index** 11% of the population was below poverty line last year.
- There is rise of **5 times** from 2011-12 levels in urban and rural consumption and India's growth is **very broad-based.**

Multi-dimensional Poverty Index:

- Findings of **NITI Aayog's Discussion Paper** 'Multidimensional Poverty in India since 2005-06':

METHODOLOGY:

- **The dual-cutoff approach** of the **Alkire-Foster (AF) methodology** – the one used in the Global MPI Report – was considered suitable for the national context.
- MPI captures broad qualitative aspects of people's life across **3 dimensions – Health, Education, and Standard of living.**
- The national MPI largely follows the global methodology.
- India's **national MPI retained 10 indicators from the Global MPI** and has added **2 new indicators**, namely **Maternal Health (in the dimension of Health)** and **Bank Account (in the dimension of Standard of Living).**

Computing MPI:

- Each household is assigned a deprivation score based on its deprivation in each of the 12 indicators.

- If the deprivation score of a household is above 33%, they are multidimensionally poor.

Indices of MPI:

Headcount ratio (H): How many are poor?

- Proportion of multidimensionally poor obtained by dividing number of multi dimensionally poor persons by total population.
- **Intensity of poverty (A):** How poor are the poor?
- The weighted deprivation scores of all poor people are summed and then divided by the total number of poor people.
- Finally , $MPI = H \times A$

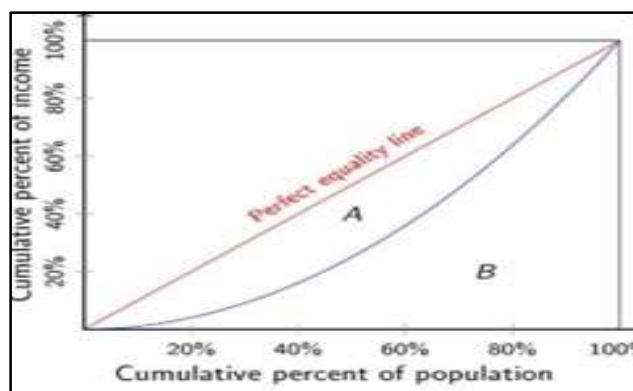
Recent MPI-INDIA findings 2023:

- 24.82 crore Indians escape Multidimensional Poverty in last 9 years.
- Steep decline in Poverty Headcount Ratio from 29.17% in 2013-14 to **11.28%** in 2022-23.
- All **12 MPI** indicators show significant signs of improvement.
- **Uttar Pradesh, Bihar, and Madhya Pradesh** recorded largest decline in the number of MPI poor between 2013-14 and 2022-23.
- **Poorer states record faster decline** in poverty – indicating **reduction in disparities**.
- India is likely to achieve **SDG Target 1.2** (reducing multidimensional poverty by at least half) much ahead of 2030.

Gini coefficient:

- Gini coefficient is an indicator of income or wealth inequality and is derived from **the Lorenz curve**.

Loren curve:



- The coefficient ranges from 0 (0%) to 1 (100%), with 0 representing perfect equality and 1 representing perfect inequality.

Topic 51. DISCOVERY OF TEMPLES IN TELANGANA SHOWS SPREAD OF CHALUKYA REIGN

Important for the subject: History

What is new discovery:

Team discovered **two temples** on Bank of the **Krishna River** and **five within the Mudimanikyam village in Telangana.**

- Team also discovered **an inscription** dated to the rulers of Badami Chalukyas (the present-day Karnataka and Andhra Pradesh) who ruled **between 543 AD and 750 AD.**

Features of temple:

- The temples reflect **Deccan**
- It has space for **more than two religions**: Brahmanical, Buddhism and Jainism religion.

Earlier extent of kingdom:

- The Jogulamba temples at Alampur and the submerged Yeleswaram sites were the furthest reach of Chalukya Badami kingdom.
- This new information **expands the historical extent** of that realm.

The Jogulamba temples:

- A Hindu temple dedicated to **Goddess Jogulamba, a Maha Shakti peeth** located in Alampur, Telangana, India.
- Alampur is located on the banks of the **Tungabhadra River** near its confluence with Krishna River. Jogulamba temple is located in the same complex as that of the **Navabrahma Temples**, a group of **nine Shiva temples** built in the **seventh-eighth century CE.**

Yeleswaram:

- A Buddhist site, Yeleswaram is located in Devarakonda Taluk of **Nalgonda**
- It reveals **the relics of the upper Palaeolithic, Microlithic, Chalcolithic and Megalithic ages.**
- Inscriptions of **Western Chalukyas, Telugu Cholas, Kakatiyas and Yadavas** were recovered.

Topic 52. IS LORD KRISHNA'S DWARKA UNDER WATER? THE MANY LEGENDS, TRACES OF A LOST CITY

Important for the subject: History



PM Narendra Modi recently performed underwater prayers at '**Dwarka Nagari**', believed to be the kingdom of Lord Krishna.

- Since the start of the 20th century, several attempts have been made by scholars to establish the location of **Dwarka as mentioned in the Mahabharata**.
- PM Narendra Modi inaugurated several infrastructural projects, including the **Sudarshan Setu**, India's longest cable-stayed project connecting Okha town with the island of Beyt Dwarka.
- He also went scuba diving off the **Panchkui beach coast** and performed underwater prayers at the site of what's considered to be Dwarka Nagari – **the mythological kingdom of Lord Krishna in the Mahabharata**.

Dwarka in mythology

- Dwarka has immense significance in Hindu culture due to its association with **Lord Krishna and the Mahabharata**.
- It is believed that after **killing his uncle Kamsa, Krishna migrated from Mathura to Dwarka with his Yadava clan**, and founded his kingdom here by reclaiming 12 yojana land from the sea.
- References in the **Vishnu Purana suggest that Dwarka was a city of beautiful gardens, moats, ponds and palaces**.
- The town is believed to have been submerged under the sea after the **death of Lord Krishna**.

Locating Dwarka

- Present-day **Dwarka is a coastal town located at the mouth of the Gulf of Kutch, facing the Arabian Sea**.

- The town is a part of the **Krishna pilgrimage circuit, which includes Vrindavan, Mathura, Govardhan, Kurukshetra and Puri**, and is home to the 13th-century Dwarkadheesh temple dedicated to Lord Krishna.
- There are a number of other places scattered along the **Saurashtra coast that find a mention in legends associated with Lord Krishna, including Bet Dwarka and Mul Dwarka.**
- **Is it the same as present-day Dwarka? A town that possibly now lies under the sea? Or a mythological town whose historical authenticity may never be established?**
- Dwarka was located on the 'Raivataka', a mountain range mentioned in the Mahabharata, and which is believed to be the present-day Girnar hills in Junagadh, around 200 km away from Dwarka town.

Archaeological findings on land

- From the 1960s onwards, attention shifted from ancient literature to finding material evidence for the existence of Lord Krishna's Dwarka.
- While the early excavations focused on land around present-day Dwarka, as speculation over a submerged city heightened, later explorations were conducted under water.
- The first excavation was carried out close to the Dwarkadheesh temple in 1963 by the Deccan College in Pune, in association with the Gujarat government's Department of Archaeology.

About Sudarshan Setu:

- This landmark project, recently inaugurated by Hon'ble Prime Minister Narendra Modi, connects Okha and Beyt Dwarka island.
- Spanning 2.32 km over the majestic Arabian Sea, Sudarshan Setu stands as an engineering marvel.
- It is India's longest cable bridge.

Topic 53. CONGRESS ALLEGES I-T DEPT WITHDREW 65CR FROM ITS ACCOUNTS: DO POLITICAL PARTIES HAVE TO PAY INCOME TAX?

Important for the subject: Polity

The Congress party alleged that the Income Tax Department instructed banks to transfer over Rs. 65 crore from the accounts of **the Congress, the Youth Congress (IYC) and the National Students' Union of India (NSUI).**

Are political parties required to pay income tax?

- The **Income Tax Act, 1961**, exempts political parties registered by the Election Commission under the Representation of the People Act, 1951 from paying income tax, with some conditions.
- **Section 13-A of the Act**, pertains to special provision relating to incomes of political parties,
- These provisions say that any income **under the heads of income from house property, income from other sources, capital gains and income from voluntary contributions** shall not be included in the total income of the previous year of the party.
- This is the case, provided that the party maintains books of account and other documents that would enable the **Assessing Officer to “properly deduce its income”**; **maintains a record of all contributions above Rs. 20,000 each**; has its accounts audited by an accountant; and **does not accept any donation above Rs. 2,000 each in cash**.
- The exemption is valid as long as the **treasurer of the party or any other person authorized by the party submits a declaration of its donations to the Election Commission** before the due date of filing Income Tax returns.

Are political parties required to file Income Tax returns?

- Parties are required to file their returns if their total income, **before taking into account the exemptions under Section 13A**, is higher than the income tax exemption limit.
- **Section 139 (4B)** says if the total income in respect of which the political party is assessable (the total income for this purpose being computed under this Act without giving effect to the provisions of section 13A) **exceeds the maximum amount which is not chargeable to income-tax**, furnish a return of such income of the previous year in the prescribed form.

Topic 54. ENTIRE COUNTRY HAS BEEN TAKEN FOR A RIDE’: SC ISSUES CONTEMPT NOTICE TO PATANJALI OVER ‘MISLEADING’ ADS

Important for the subject: Polity

The Supreme Court February 27 came down heavily on Patanjali Ayurved for continuing to publish misleading advertisements regarding medicinal cures.

Key findings from the case.

- The bench of **Justices Hima Kohli and Ahsanuddin Amanullah** also restrained the company from advertising or branding of products made by it for treating diseases/conditions as laid down in **Drugs and Magic Remedies (Objectionable Advertisement) Act, 1954**, and the rules framed under it.
- The Supreme Court issued contempt of court notice to **Patanjali Ayurveda and its Director Acharya Balkrishna**.

- The Indian Medical Association had accused **Patanjali** of carrying out a smear campaign against modern medicine and vaccination.
- The company had continued to issue advertisements about the efficacy of its medicines and that this was prohibited under the **Drugs and Magic Remedies (Objectionable Advertisements) Act**.
- The **Advertising Standards Council of India (ASCI)** had been receiving “multiple complaints” about Patanjali’s advertisements and that the Council had “upheld” some of these.

About Advertising Standards Council of India (ASCI):

- **ASCI was formed in 1985** by professionals from the advertising and media industry to keep Indian ads decent, fair and honest.
- The **Advertising Standards Council of India (ASCI)** aims to ensure advertisements in India are fair, honest and are compliant with the **ASCI Code**.

About Contempt of Court:

- **Article 129 of the Constitution** conferred on the **Supreme Court** the power to punish contempt of itself.
- **Article 215** conferred a corresponding power on the **High Courts**.

The Contempt of Courts Act, 1971, gives statutory backing to the idea.

- It includes **power to punish for contempt of court**.
- It is both civil and criminal punishment i.e., **jail term up to 6 months or Rs 2000 as fine or both**.
- The SC has power to punish not only for itself, but HCs, subordinate courts and tribunals within the country.

Civil contempt:

- When there is wilful disobedience of any of the **judgment, order, writ or other processes of a court or breach of undertaking to the court**.

Criminal contempt:

- Publication of any matter or doing an act which:
 - 1) **scandalizes or lowers court’s authority;**
 - 2) **Prejudices or interferes with the due proceedings of the court;**
 - 3) **Interferes or obstructs the administration of justice in any manner.**
- **Innocent publication and distribution of matter, fair and true reporting of judicial proceedings, fair and reasonable criticism of judicial acts and comment on the administrative side of judiciary does not warrant contempt of court.**

Topic 55. FORMER SUPREME COURT JUDGE JUSTICE AM KHANWILKAR IS NEW LOKPAL CHAIRPERSON

Important for the subject: Polity

President of India Draupadi Murmu has appointed former Supreme Court judge Justice AM Khanwilkar as the Chairperson of the Lokpal, Live Law reported.

- The Lokpal is an anti-corruption body that is authorised to investigate corruption charges against top public functionaries including the prime minister, Cabinet ministers, members of Parliament and Group A officials at the Centre.
- The present chairperson of the Law Commission of India and three former high court judges, including former Himachal High Court Chief Justice Lingappa Swamy, former Allahabad High Court Chief Justice Sanjay Yadav and former Karnataka High Court Chief Justice Ritu Raj Awasthi, have been appointed as the judicial members of the Lokpal.
- Three former bureaucrats – Sushil Chandra Pankaj Kumar and Ajay Tirkey – have been appointed as its non-judicial members.

Lokpal and Lokayuktas Act 2013:

- The Act allows for setting up of **anti-corruption ombudsman** called Lokpal at the Centre.
- **Composition:** The Lokpal will consist of a **chairperson and a maximum of eight members**.
- Chairperson should have been a **Chief Justice of India, or is or has been a judge of the Supreme Court, or an eminent person** who fulfils eligibility criteria as specified.
- **50% of the members are to be judicial members** provided that **not less than 50% of the members belong to the Scheduled Castes, Scheduled Tribes, OBCs, minorities, and women**.
- **Inquiry Wing:** Lokpal will have an Inquiry Wing for conducting preliminary inquiry into any offence alleged to have been committed by a public servant punishable under the Prevention of Corruption Act, 1988.
- **Prosecution Wing:** It will also have a Prosecution Wing for the prosecution of public servants in relation to any complaint by the Lokpal under this Act.

Powers:

- The Lokpal will have the **power of superintendence and direction over any investigation agency including CBI** for cases referred to them by the ombudsman.
- As per the Act, the Lokpal **can summon or question any public servant** if there exists a prima facie case against the person, even before an investigation agency (such as vigilance or CBI) has begun the probe.

- Any officer of the CBI investigating a case referred to it by the Lokpal, shall not be transferred without the approval of the Lokpal.
- An **investigation** must be completed **within six months**. However, the Lokpal or Lokayukta may allow extensions of six months at a time provided the reasons for the need of such extensions are given in writing.
- **Special courts will be instituted** to conduct trials on cases referred by Lokpal.
- **Jurisdiction of Lokpal:** It covers a wide range of public servants — from the Prime Minister (PM), ministers and MP, to groups A,B,C,D officers of the central government including the chairperson and members of the Lokpal. However, there are some **exceptions for PM:**
- Lokpal **cannot inquire allegations against the PM relating to international relations, external and internal security, public order, atomic energy and space.**
- Also, complaints against the PM are **not to be probed** unless the **full Lokpal bench considers the initiation of inquiry and at least 2/3rds of the members approve it.**
- Such an inquiry against the Prime Minister (if conducted) is to be **held in camera** and if the Lokpal comes to the conclusion that the complaint deserves to be dismissed, the records of the inquiry are not to be published or made available to anyone.

Selection committee:

- Once the search committee submits its recommendation for the Lokpal and its members, a selection committee will consider those names and forward them to the President for his consideration.
- The five-member selection committee comprises the following –**Prime Minister (chairperson), Lok Sabha Speaker, Leader of the Opposition, Chief Justice of India and An Eminent jurist nominated by the President.**



Topic 56. WATER OF GANGA, 21 OTHER RIVERS IN BIHAR UNFIT TO EVEN BATHE IN, FINDS STATE POLLUTION CONTROL BOARD

Important for the subject: Geography

The **Bihar State Pollution Control Board's (BSPCB) annual report** for **2023-24** has declared the **water quality of 22 rivers in Bihar**, including the **Ganga**, as **unfit for bathing**.

- Despite this, many people continue to use the river for holy dips and rituals, rejecting concerns over water quality.
- The **BSPCB's findings** are based on **water quality monitoring at 98 locations**, revealing **high levels of bacterial contamination**, such as **faecal and total coliforms**, across rivers like **Ganga, Son, Punpun**, and others.
- The **rivers whose water quality was examined** are: **Ganga, Son, Punpun, Gandak, Burhi Gandak, Ghaghra, Bagmati, Kosi, Sikrahna, Mahananda, Ram Rekha, Harbora, Parmar, Manusamar, Lakhandei, Kohra, Ghaunsh, Daha, Kamala, Gangi, Harha and Sirsia**.
- This **pollution** primarily stems from the discharge of **untreated sewage and wastewater** into these rivers.
- In **Patna**, **six sewage treatment plants (STPs)** were set up under the **Namami Gange project** but are not fully operational, contributing to the **pollution**.
- The capacity of these **STPs** is insufficient to handle the **city's effluent discharge**.
- The situation is exacerbated by the **direct release of sewage, domestic, and biomedical waste** into the **Ganga**, with about **20 major drains** contributing to the pollution.
- The **number of polluted rivers in Bihar** has risen from **six in 2018 to 22**, with thousands continuing to use the contaminated water, posing significant health risks.

Topic 57. LEAP YEAR: HOW DOES IT WORK? WHY FEBRUARY 29?

Important for the subject: Geography

This year, February will be a day longer than usual as 2024 is a leap year.

About Leap Year:

- Leap years are characterized by the insertion of an extra day i.e. **February 29** every four years is crucial for maintaining the precision of our calendar.
- The periodic adjustment aligns our **societal timekeeping with the Earth's orbital cycle around the sun, highlighting the intricate balance between human conventions and natural phenomena**.

- **2024 is a leap year**, a calendar oddity that adds one extra day to the otherwise 365 days that form a year.

Why Do We Need Them?

- Our calendar year consists of **365 days**, but the **Earth's journey around the sun actually takes about 365.24 days**.
- That difference might **seem small, but over time, it adds up**.
- Without leap years, our calendar would gradually fall out of sync with the seasons.
- Imagine if summer started in December instead of June.
- Leap years ensure that doesn't happen by adding an extra day i.e. February 29, every four years.

The Mechanics of Leap Years: How Do They Work?

- Leap years operate on a simple principle: adding one extra day every four years helps to balance out the discrepancy between our calendar and the solar year.
- By adding that extra day, we overshoot a bit, accumulating about 44 extra minutes every four years.
- To counteract this, we skip leap years every century, **except for those divisible by 400, like the year 2000**.

Why February 29?

- February was the **natural pick, for the addition of an extra day**.
- It's the shortest month of the year, making it the **perfect candidate for an extra day**.
- This addition helps to keep everything in sync without throwing off the balance too much.