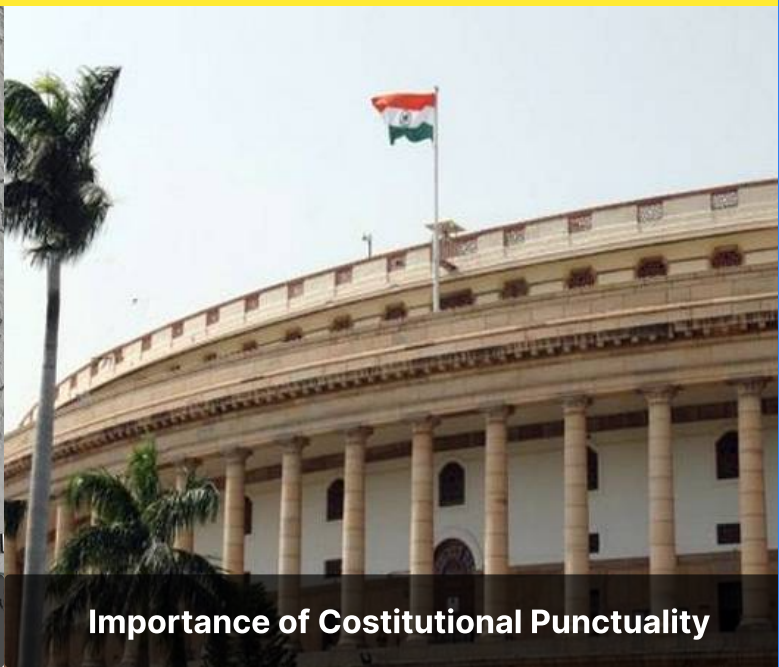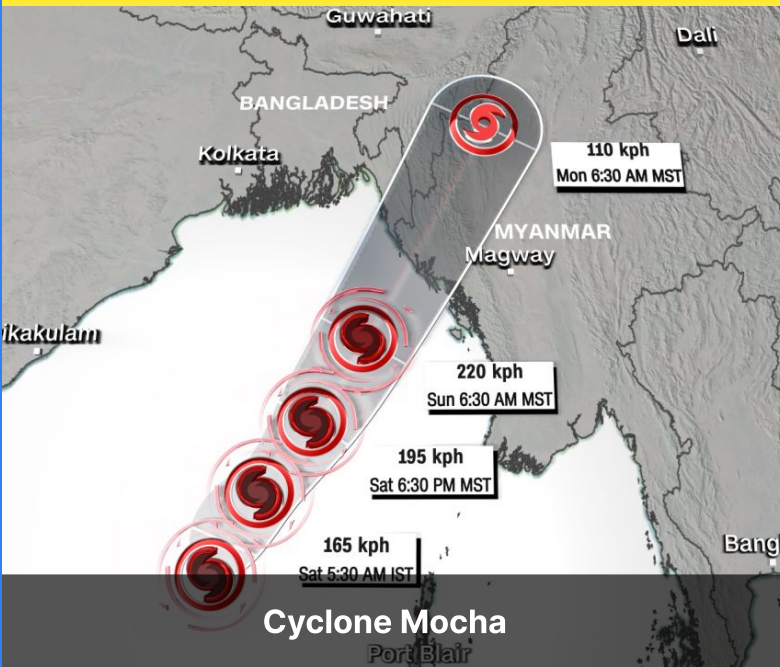# Prepp

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Physical Geography, Important geophysical Phenomenon

Mocha: Cyclone Intensification May Not Be Very High Since It Will Be Formed In Heart Of The Bay, Say Experts

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booste: Physical Geography
Prepp Mains Booster: Important Geophysical Phenomenon, Disaster Management

Why in the news?

- Recently, **Cyclone Mocha, a tropical cyclone hit the Bangladesh and Myanmar coasts in May 2023** causing widespread damage to the population, environment, and infrastructure.
- **It was formed in the Bay of Bengal** and has been noted as the strongest cyclone for all seasons in the Northern Indian Ocean, tying with Cyclone Fani (2019) in terms of intensity and speed.

What is Cyclone Mocha?

- **Mocha is a tropical cyclone that formed in the Northern Indian Ocean (Bay of Bengal)** in May 2023 and is the first tropical storm of the 2023 North Indian Ocean cyclone season.
- **Cyclone Mocha became the second-most intense cyclone to develop in the Bay of Bengal** in the month since 1982. This is tied with the second most rapid intensification by a pre-monsoon season cyclone in the Bay of Bengal since 2000.
  - According to climate scientists one of the primary factors for the intensification of the cyclone was the warm oceans.
  - **The intensification of cyclones has been largely driven by the dominance of ocean heat and the significant influence of warm sea surfaces.**
  - The higher temperatures of the ocean infuse more convection leading to intensified cyclones.
  - In recent years, the Bay of Bengal has recorded temperatures between 30 and 32°C which has meant that cyclones formed in the region retain their energy for a longer time.
  - As a result of the better energy retention, they can travel over land as a strong cyclones for a longer period, thereby causing massive destruction.
- It **originated from a depression** that was first observed on 8th May by the Indian Meteorological Department. It later strengthened and consolidated into a cyclonic storm, reaching a **peak of Category-5 intensity.**

- Mocha made landfall over Myanmar on May 14th, 2023.
- Mocha has been classified as an **Extremely Severe Cyclonic Storm by the IMD** and as a **Super Cyclone by Zoom Earth.**
- The Typhoon Research Center of the Jeju National University, South Korea, Mocha is the **fastest cyclone that occurred in 2023.**
- The cyclone reached a maximum speed of 130 knots or 277 kmph before slowing to 160 kmph at the time of landfall.
- The three most intense cyclones in May in the Bay of Bengal have been:
  - Amphan, May 2020: 265 kmph
  - May 1990 cyclone (Andhra Pradesh): 231 kmph
  - May 1997 (Bangladesh) and Mocha: 212 kmph

How are Cyclones formed?

- Cyclogenesis (process of cyclone formation and intensification) plays a crucial role in the formation and intensification of cyclones. It encompasses a range of processes that contribute to the development of these weather systems.
- Cyclones, including tropical cyclones or hurricanes, typically occur near the equator, where warm ocean waters prevail.
- The initial stages involve warm, moist air rising from the ocean's surface, creating a region of low atmospheric pressure.
- This low-pressure zone attracts cooler air from surrounding areas, which, upon entering, becomes warm and moist, subsequently rising as well. This cycle perpetuates, resulting in a continuous inflow of air.
- As the warm, moist air ascends, it cools, leading to the formation of clouds. This cyclical pattern persists, ultimately giving rise to a cyclone.
- Wind speeds exceeding 63 miles per hour classify the system as a tropical storm, while winds reaching 119 miles per hour or more classify it as a tropical cyclone or hurricane.

Impact of Cyclone Mocha

- Cyclone Mocha caused widespread damage to Myanmar and Bangladesh, while also affecting some parts of India and Sri Lanka.
- Tropical cyclones can result in various hazards that can individually impact life and property in affected areas and cause substantial damage as a result of their interaction.
- These include **storm surges, flooding, extreme winds, tornadoes, and lightning.**

On Myanmar

- The Myanmar Government has stated that around 460 people were killed and hundreds injured, the majority of whom are Rohingya refugees.

- As of 18th May, at least 183,042 houses, 1,770 religious buildings, 1,397 schools, 227 medical facilities, 2 airports, and 340 government buildings were destroyed.
- The cyclone also caused flooding of **Salin Creek, near the Irrawaddy river**.
- Rakhine state in Myanmar was the worst affected with some observers claiming that not a single building in the capital, Sittwe, was spared from the effect of the cyclone.

On Bangladesh

- Reports revealed that more than 400,000 people were affected across the nation.
- According to UN officials, the tropical cyclone caused flooding and landslides which resulted in the destruction and damage of refugee camps housing 40,000 refugees in Cox Bazaar.
- Storm surges of up to four meters were recorded. Experts have claimed that this could have potentially swamped villages in low-lying areas.

On Sri Lanka

- Nearly 2000 people were affected by the indirect effects of the cyclone including the death of one person.

On India

- India was spared the worst as cyclone Mocha which was initially projected to make landfall on the country's eastern coast turned away towards Bangladesh and Myanmar.
- Houses and refugee camps in Mizoram experienced significant damage due to the cyclone.
- Intense rainfall recorded in Kolkata has also been attributed to the cyclone.

Cyclones in Previous years

- **Cyclone Asani** developed in the first week of May 2022 and dissipated in the second week. It had drawn the monsoon winds into the Andaman Sea but had not gone any farther.
  - After a few days of solid development, the monsoon stopped over the Bay of Bengal for many days, however, it did make an appearance across Kerala on May 29, which was earlier than the customary date of June 1. This was, however, a few days later than IMD had projected.
  - The monsoon's onset over the rest of the country in the first month had also remained patchy without much rain.
- **Cyclone Tauktae: I**n 2021 before the monsoon season began, Cyclone Tauktae formed in the Arabian Sea in the second and third weeks of May. It was one of the strongest storms to make landfall along the country's western coast, and it disrupted the formation of monsoon winds over the Bay of Bengal.
- **Cyclone Yaas**: It originated in the Bay of Bengal in the final week of May 2021, just before the start of the monsoon

season, and drew winds to the east. As a result, Yaas precipitated early rains and floods in various areas, including Bihar.

- **Cyclone Amphan in the Bay of Bengal and Cyclone Nisarga in the Arabian Sea** both contested the start and advancement of the monsoon season over India in 2020.
- **Cyclone Fani:** Extremely Severe Cyclonic Storm Fani was the worst tropical cyclone to hit the Indian state of Odisha since the 1999 Odisha cyclone. Fani, the second named storm and the first strong cyclonic storm of the 2019 North Indian Ocean cyclone season, developed on April 26 in the Indian Ocean west of Sumatra.

Rehabilitation efforts

- The effect of the cyclone in Myanmar was worsened by the civil conflict in the country, where there is a significant population of internally displaced persons (IDPs).
- The UN has claimed that nearly $375 million was necessary to help the millions of people displaced in Bangladesh and Myanmar by the cyclone.
- It also claimed a supplementary aid of $122 million in addition to the $211 million in funds available for cyclone response in Myanmar.
- The **World Food Programme** stocked supplies in its warehouses in Rakhine while the **United Nations Development Programme** in coordination with the Bangladesh government mobilized 1,600 Rohingya refugees to prepare the camp in Kutu Palong.
- The Myanmar government opened pagodas and schools to ensure the safety of the people in Rakhine.
- India launched **Operation Karuna** as part of its HADR efforts in the region as a part of which emergency food items, tents, essential medicines, water pumps, portable generators, clothes, and sanitary and hygiene items were supplied to Yangon via naval ships.
- The UN Resident and Humanitarian Coordinator of Bangladesh claimed that the people of the two countries who were affected by Mocha could face a long and dire monsoon season if rehabilitation activities could not be performed effectively.

How are cyclones in the Indian Ocean named?

- In 2000, the **World Meteorological Organisation/United Nations Economic and Social Commission for Asia and the Pacific or WMO/ESCAP**, comprising Bangladesh, India, the Maldives, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand, established a new procedure for naming cyclones in the region.
- The WMO/ESCAP was expanded in 2018 to include Iran, Qatar, Saudi Arabia, the U.A.E., and Yemen.
- The list of names submitted by each of the countries was approved by the WMO/ESCAP panel.

- In 2020, a list of 169 names, 13 from each country, was released by the IMD. The names are then organized alphabetically and country-wise.
- The **name Mocha or Mokha was proposed by Yemen after a port city on the Red Sea that is famous for its coffee production.**
- The next name on the list is **Biporjoy, which was proposed by Bangladesh.**

Role of Women And Women Related Organizations

Context:

- Kudumbasree is arguably the world's largest women's collective or a Self Help Group with members involved in various streams such as farming, catering, waste collection, making light bulbs and sanitary napkins, anti-dowry crusades, and rescue activities during floods will complete 25 years on May 17th 2023.
- Kudumbasree has been included in the Best Practices Global 100 List 2022 of UN Habitat and picked as a model for poverty eradication and women empowerment by International Training for Programme for Developing Countries
- The Kudumbashree's biggest contribution to social change has been its influence on the lives of almost half the state's population of women.
- According to the Multidimensional Poverty Index 2021, only 0.7% of the population of Kerala is multidimensionally poor in comparison to the poverty ratio before the launch of the Kudumbasree which was 25.76% and 24.59% in rural and urban areas respectively..

What is the Kudumbasree Mission?

- The **Kudumbasree Mission was launched in 1998 by the Government of Kerala as part of its People's Plan Campaign** that envisioned women at the center of democracy.
- 49,200 micro-enterprises, including 31,589 individual units, and 17,611 group enterprises are run under the ambit of the Mission, making it so ubiquitous that at least one initiative of

the Kudumbasree can be found every half a kilometer in Kerala.
- The Kudumbasree movement which was **envisioned as a poverty eradication scheme under the State Poverty Eradication Mission (SPEM)** has already achieved its primary goals and now emerged as a tool of social alleviation that has changed the lives of over 50 lakh women of all social strata in the state.

25 YEARS OF KUDUMBASHREE

3,09,667 Neighbourhood groups	1,070 Community Development Societies	19,470 Area Development Society

Micro-enterprises	49,200
Individual units	31,589
Group enterprises	17,611
Hotels	1,184
Santwanam units (small clinics)	405
Tribal families covered	1,24,904
Exclusive tribal neighbourhood groups	7,135
Harithakarma sena (who collects non-biodegradable waste)	27,536

Building construction units 228	Farm group units 75,762	Agri-business units 1,235

20,348.94 acre AREA UNDER CULTIVATION

Source: www.kudumbashree.org

Impact of the Kudumbasree

- Kudumbasree's influence and impact have been tremendous from a social and financial perspective in terms of its mobilization of women.
- The Mission has enabled the financial liberation of women enabling them to contribute significantly to household incomes.
- The success of the various initiatives under the Mission has changed the perception of men in regard to the Mission making it easier for women to start new ventures and run existing ventures efficiently.
- The Mission has also contributed to the social and political mobility of women in the state.
- According to the **National Multidimensional Poverty Index 2021**, which captures deprivations in education, health, and other living standards asides from monetary poverty, **only 0.7% of people in Kerala are multidimensionally poor** - the lowest in the country.
- Prior to the launch of the Kudumbasree, the **poverty ratio in rural and urban Kerala was around 25.76% and 24.59% respectively.**

- According to the **Report of the Rangarajan Committee on Poverty Estimation in India, the poverty ratio in Kerala has declined to 7.3% in rural areas and 5.3% in urban areas by 2011-12.**
- 7,038 of the 11,000 seats reserved for women in the 2020 local body elections were won by active Kudumbashree members, increasing from just 848 in 2005.
- The **Kudumbasree Mission has been included in the UN Habitat's Best Practices Global 100 List in 2022 and has also been recognized as a model for poverty eradication and women empowerment by the International Training for Programme for Developing Countries.**

Why was the Kudumbasree formed?

- In the aftermath of the economic acceleration of the 1980s, the challenges faced by the state in the 1990s acquired different dimensions.
- Although the standard of living in the state had improved, the old developmental models needed to be reformed and new avenues of employment discovered as conventional employment was drying up.
- Households, especially in the lower middle class, could no longer depend on the income of a single member while women, who were the principal caregivers, faced the burden of unpaid household chores while also facing discrimination, gender stereotypes, and low social standing.
- Issac, who was then a member of the State Planning Board, stated that **democratic decentralization**, although in opposition to the communist party's ideals of democratic centralization, was the need of the hour.
- The **Kudumbasree Mission represented decentralization as a social movement, not a bureaucratic one. It focussed on social mobilization and the widening of political democracy rather than economic planning.**

Similar initiatives

- In the late 70s, Gandhian ideologue D Pankajakshan Kurup initiated a three-tier program in Alappuzha which functioned through the tharakootam (neighborhood within neighborhood), followed by ayalkootam (neighborhood groups) and then gramakootam (village groups).
- In the mid-80s, the government set up NHGs for the implementation of India's Poverty Alleviation Programme for the urban poor.
- Another program was the Kerala Shastra Sahitya Parishad whose members would teach the illiterate in their spare time.

Room for Improvement

- Not every project has been successful with many members not able to gain a consistent source of income and livelihood.
- Inconsistent weather and financial instability have impacted members in agriculture while the pandemic and subsequent lockdown affected most enterprises.

- Some members have also expressed concerns over unpaid subsidies and corruption.
- There is scope for scaling up the mission as it can evolve into a micro-enterprise (business) instead of just serving as a micro-finance organization.
- As a result of better branding too, more younger women could be incentivized into the group, which could become an employment-generation platform that can successfully create revenue-earning jobs.

Lack Of Committees Against Sexual Harassment Is Disquieting

Priority: High
Primary Source: The Hindu
Prepp Prelims Booster: Social Justice
Prepp Mains Booster: Issues related to women

Context:

- Recently, the Supreme Court ruled that there are "serious lapses" and "uncertainty" in the execution of the **Protection of Women from Sexual Harassment (PoSH) Act,** leaving many working women no choice but to leave their jobs.

Background

- The 2013 law broadened and gave legislative backing to what are known as the Vishaka Guidelines, which were laid down by the Supreme Court in a judgment passed in 1997.
- The complaint was launched by women's rights organizations, including Vishaka, in response to the alleged gangrape of Bhanwari Devi, a social worker from Rajasthan.
  o Bhanwari had battled against the marriage of a one-year-old infant girl in 1992, and was reportedly gangraped in retaliation.
- The Vishaka Guidelines defined sexual harassment and put three important tasks on institutions: prohibition, prevention, and reparation.
- The Supreme Court ordered that a Complaints Committee be formed to investigate allegations of sexual harassment of women at work.

About Protection of Women from Sexual Harassment (PoSH) Act

- The **Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, commonly known as the PoSH Act, was passed in 2013.**
- It defined sexual harassment, lay down the procedures for complaint and inquiry, and the action to be taken in cases of sexual harassment.
- The act defines sexual harassment in the workplace and establishes a complaint-handling process.
  o **Every company is obligated to form an Internal Complaints Committee (ICC)** in each office or branch with ten or more workers.
- The Complaints Committees have the same investigative powers as civil courts.

- If the complainant requests it, the Complaints Committees must provide for mediation before launching an investigation.

Objective of PoSH act

- The objective of the Protection of Women from Sexual Harassment Act, 2013 is to provide protection to women from sexual harassment at workplace and to ensure safe working conditions for women.
- The act seeks to prevent and address sexual harassment at workplace and provide redressal mechanisms for women who have been subject to such harassment.
- The act defines sexual harassment as any unwelcome act or behavior (whether directly or by implication) such as physical contact, a demand or request for sexual favours, making sexually colored remarks, showing pornography or any other unwelcome physical, verbal or non-verbal conduct of sexual nature.
- It also mandates employers to set up an Internal Complaints Committee (ICC) to receive and address complaints of sexual harassment at workplace.
- The ICC is required to conduct an inquiry into the complaint and submit its findings and recommendations to the employer.
- It also provides for the punishment of the perpetrator of sexual harassment and the protection of the victim from victimization or retaliation.

Provisions of the act

- **Sexual harassment at workplace:** Unwanted sexual physical, verbal, or nonverbal activity at work is characterized as physical contact and advances, demand or desire for sexual favors, making sexually tinged comments, exhibiting pornography, etc.
- **Notion of "extended workplace":** It defines "workplace" as any location where an employee goes as a result of work, including transportation provided by the organization for the purpose of travel.
- **Complaints Committees:** The Act requires any firm or organization with more than ten workers to form an Internal Complaint Committee (ICC) to hear and handle sexual harassment accusations.
  - In 2017, the MoWCD launched SHe-Box, an online portal that forwards complaints to the employer's or organization's ICC. The Act requires the District Officer to form a Local Complaint Committee in each district with less than ten employees.
- **Employer duties and obligations:** It is a legal need to tackle sexual harassment as a breach of service standards. If the employer fails to comply with the requirements, a penalty of Rs. 50000 may be imposed, and the license may be revoked.

What does the act say about the Complaints Committee?

- The PoSH Act requires that every employer form an Internal Complaints Committee (ICC) at each office or branch with ten or more employees.
- It specified several characteristics of sexual harassment and established processes for response in the event of a complaint.
- A woman "of any age, whether employed [at the workplace] or not" who "alleges to have been subjected to any act of sexual harassment" might be the aggrieved victim under the act.
- In effect, the act guarantees the rights of all women who work or visit any workplace in any capacity.

Issues Highlighted by the Supreme Court

- **Uncertainty in Implementation:** Uncertainty about who to approach in the event of sexual harassment at work.
- **Hesitation:** Lack of faith in the PoSH procedure and its conclusion. Women who have experienced sexual harassment in the workplace are hesitant to report it.
- **Insensitive comments:** A harsh, insensitive, and unresponsive working atmosphere toward female employees jeopardizes the Act's success.
- **Fear of stepping out of homes:** If authorities/management/employers cannot ensure women of a safe and secure workplace, they will be afraid of walking out of their homes to create a respectable livelihood and fully exploit their potential and talents.
- **Inquiry Process:** Many times, the inquiry process has been completed in a "hurry" without regard for natural justice principles.

Recommendations

- The Supreme Court has asked the Union, States, and UTs to conduct a time-bound (8-week) exercise to determine if Ministries, Departments, government organizations have established Internal Complaints Committees (ICCs), Local Committees (LCs), and Internal Committees (ICs) in accordance with the act.
  - These organizations have been compelled to post information on their various committees on their websites.
- The act must be expanded to include domestic workers. The definition of 'sexual harassment' must be expanded to consider perception of the victim.

Salient Features of Indian Society

Row Over Adopting Father's Surname In Matrilineal Meghalaya

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Important tribes in news: Khasi Tribes
Prepp Mains Booster: Salient features of Indian Society, Diversity of India. Role of women

Context:

- Recently, a tribal council's order not to issue a **Scheduled Tribe (ST) certificate** to **any Khasi** person **who adopts the surname of her or his father** has triggered a war of words in matrilineal Meghalaya.
- The Khasis, numbering about 1.39 lakh, are one of the three indigenous **matrilineal communities in the northeastern State of Meghalaya**. The other two are **Garos and Jaintias.**

What is the row over adopting the father's surname in matrilineal Meghalaya?

- The Voice of the People Party (VPP), a political party in Meghalaya has been critical of the Khasi Hills Autonomous District Council (KHADC) order.
- VPP president and MLA, Ardent Miller Basaiawmoit criticized the order stating that his children are using his surname and it is an attempt to take away their right of being called Khasis.
- The order states the KHADC directed the headmen of all villages and urban localities across the **Khasi domain not to issue ST certificates** to those who adopt their father's surname instead of sticking to tradition by taking their mother's clan name.
- KHADC's chief executive member emphasized that the KHADC was committed to the preservation and protection of the age-old tradition of the community and has cited sections 3 and 12 of the **Khasi Hills Autonomous District Khasi Social Custom of Lineage Act, 1997**, which says **only those following the custom of using their mother'**s surname will be identified as a Khasi.
- He also said it is **mandatory for any Khasi woman who marries a non-Khasi to** obtain the Khasi tribe certificate for applying for the ST certificate for her children.
- **Men's rights group:** Since the 1960s, men's rights advocates among the Khasis have fought for the transition from the matrilineal to the patrilineal system.
- Iktiar Longbriew Manbriew, an organisation advocating for the right to life, made a brief attempt, however, Syngkhong Rympei Thymmai founded in 1990 (home and hearth restructured) has been sustaining the crusade It has more than 4,000 members at present.

Khasi Hills Autonomous District Council (KHADC)

- The Khasi Hills Autonomous District Council (KHADC) was constituted under the **Sixth Schedule to the Constitution of India (Article 244 (2), 275** of The Constitution of India) with Executive, Legislative and Judicial powers.
- Meghalaya came into being on **21st January 1972,** carved out of the then composite state of Assam.
- It encompasses three distinct autonomous areas known as the Garo Hills, the Khasi Hills and the Jaintia Hills, each predominantly inhabited by the three ethnic major tribes, viz., the Garo Tribes, the Khasi Tribes and the Jaintia Tribes respectively.

- Meghalaya is the only State in the North East, the entire area of which is governed by the Provisions of Sixth Schedule (except Cantonment and Municipality of Shillong).

Sixth Schedule

- The Sixth Schedule under Article 244 provides for the formation of autonomous administrative divisions — **Autonomous District Councils (ADCs)** — that have some legislative, judicial, and administrative autonomy within a state.
- ADCs have up to 30 members with a term of five years and can make laws, rules and regulations with regard to land, forest, water, agriculture, village councils, health, sanitation, village- and town-level policing, inheritance, marriage and divorce, social customs and mining, etc.
- The Sixth Schedule applies to the Northeastern states of **Assam, Meghalaya, Mizoram (three Councils each), and Tripura (one Council).**

About Khasi people

- The **Khasi, Jaintia, Bhoi, War** collectively known as the **Hynniewtrep people** predominantly inhabit the districts of East Meghalaya, also known to be one of the earliest ethnic groups of settlers in the Indian subcontinent, belonging to the **Proto Austroloid Monkhmer race.**
- The Khasis inhabit the eastern part of Meghalaya, in the Khasi and Jaintia Hills. Khasis residing in Jaintia hills are now better known as Jaintias. They are also called Pnars.
- The Khasis occupying the northern lowlands and foothills are generally called Bhois. Those who live in the southern tracts are termed Wars.
- **Dress:** The traditional Khasi male dress is **"Jymphong"** or a longish sleeveless coat without collar, fastened by thongs in front.
- On ceremonial occasions, they appear in "Jymphong" and dhoti with an ornamental waistband.
- The Khasi traditional female dress is rather elaborate with several pieces of cloth, giving the body a cylindrical shape.
- **Food & Drinks:** The staple food of Khasis is rice. They also take fish and meat. Like the other tribes in the North-East, the Khasis also ferment rice-beer and make spirit out of rice or millets by distillation. The use of rice beer is a must for every ceremonial and religious occasion.
- **Social Structure:** The **Khasis, the Jaintias and the Garos** have a **matrilineal society**. Descent is traced through the mother, but the father plays an important role in the material and mental life of the family.
- **Inheritance:** Khasis follow a matrilineal system of inheritance. In the Khasi society, it is only the **youngest daughter or "Ka Khadduh"** who is eligible to inherit the ancestral property.
- **Marriage:** Marriage within a clan is taboo. Rings or Betel-nut bags are exchanged between the bride and the bridegroom

to complete the union. In the Christian families, however, marriage is purely a civil contract.

- **Religion:** The Khasis are now mostly Christians. But before that, they believed in a Supreme Being, **The Creator – U Blei Nongthaw and under Him**, there were several deities of water and of mountains and also of other natural objects.

Festivals

- **Nongkrem Dance:** Nongkrem Dance is a religious festival in t**hanksgiving to God Almighty for good harvest, peace and prosperity of the community**. It is held annually during **October/ November**, at Smit, the capital of the Khyrim Syiemship near Shillong.
- **Shad Suk Mynsiem:** One of the most important festivals of the Khasis is Ka Shad Suk Mynsiem or Dance of the joyful heart. It is an annual Thanksgiving dance held in **Shillong in April.**

Indian Heritage and Culture

Historic 'Sengol' To Be Installed In New Parliament Building: Inspired By The Cholas, Handed Over To Nehru

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Indian Heritage and Culture
Prepp Mains Booster: Indian Heritage and Culture

Context:

- Recently, the Union Home Minister said that the Prime Minister will install the **'Sengol', a historical scepter from Tamil Nadu**, in the new Parliament building which is scheduled to be inaugurated by the PM on May 28, 2023.
- The Sengol will be presented to the prime minister after this revered ceremony and placed in a glass case next to the Speaker's seat in the House.
- The 'Sengol', was received in 1947 by **India's first Prime Minister Jawaharlal Nehru** to represent the transfer of

power from the British and kept in a museum in Allahabad, will be installed in the new Parliament building.

About Sengol

- The Sengol gets its name from the Tamil word **'semmai'**, meaning righteousness.
- The **sceptre is a historical symbol of Independence** as it signifies the transfer of power from the British to the Indians.
- The Sengol is a symbol that the ruler is under the rule of law.
- The one received by Jawaharlal Nehru is an example of rich craftsmanship from top to bottom.
- The **Sengol's orb, which symbolises the world,** is surmounted by a carving of **Nandi**, Lord Shiva's sacred bull.
- The golden sceptre was **crafted by Vummidi Bangaru Chetty**, a famous jeweller in the Madras Presidency.
- The origins of the golden sceptre has its origins in the Chola empire.
- In the Chola kingdom, the transfer of power from one king to another was marked by the handing over of a Sengol, **a golden staff that had the carving of Nandi, a symbol of justice.**
- The two great epics Silapathikaram and Manimekalai records the significance of a sengol.

Why was the Sengol given to Nehru?

- According to the official document released by the government, when the handover of power from the British to the Indians was being deliberated, there was a dilemma as to what symbolism should be adopted to mark the transfer of power.
- The soon-to-be prime minister consulted **C Rajagopalachari, the last Governor-General of India**, who told him about a ceremony performed during the **Chola dynasty,** in which the transfer of power from one king to the other was sanctified and blessed by high priests.
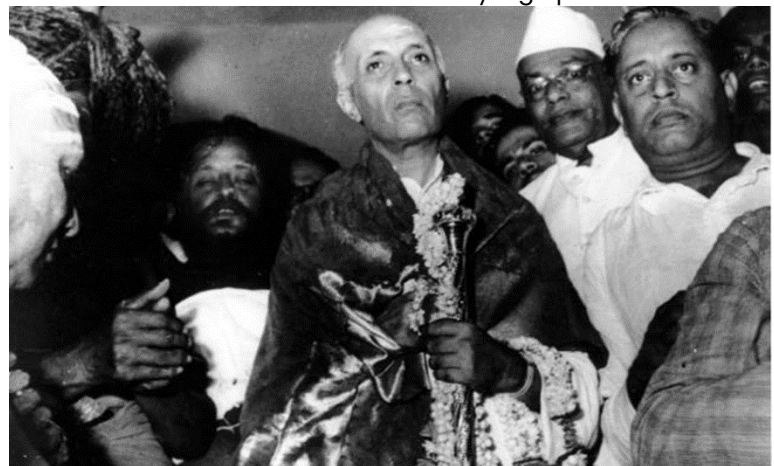
The 'handing over' ceremony on Independence Day eve

- On August 14, 1947, the deputy high priest of **Thiruvavaduthurai Adheenam** (a 500-year-old Saivaite monastery), nagaswaram player Rajarathinam Pillai, and an Odhuvar (a person who sings devotional songs in Tamil

temples) were flown to the Capital from the then Madras Presidency.

- During the ceremony, a priest gave the sceptre to **Lord Mountbatten, last Viceroy of India** and then took it back. It was then "taken in procession to Pt Jawaharlal Nehru's house, where it was handed over to him.

Lord Mountbatten (1947 – 1948)

- From 12 February 1947 to 15 August 1947, Lord Mountbatten was Viceroy of India, and from 15 August 1947 to 21 June 1948, **he was the first Governor General of Free India.**
- During his presidency, India gained independence in the form of two dominions, India and Pakistan.
- As the last Viceroy, he would oversee the British withdrawal from India and ensure a smooth transition to power, but his efforts would be futile because the partition of India he had attempted to prevent would occur regardless.
- Lord Mountbatten was a key figure in the transfer of power to the Indian Union in 1947.
- Although his decision to transfer power at such a rapid pace, by moving the date from July 1948 to August 1947, is criticised on several counts, he did his best to ensure the formation of a strong Indian union and good Indo-British relations post-independence.

For more info on Governor General and Viceroy

Copper Plates Decoded By Pune-Based Bhandarkar Institute Sheds Light On Celebrated Ancient Sanskrit Poetess Shilabhattarika

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Ancient History

Prepp Mains Booster: Ancient India, Indian culture

Context:

- Recently, researchers at the Bhandarkar Institute claim to have shed light on the Sanskrit poetess Shilabhattarika by establishing her as a daughter of the Chalukyan Emperor Pulakeshin II.
- The findings were concluded after deciphering a copper charter containing five copper plates believed to be dating from the time of the Chalukyan ruler Vijayaditya.

What have researchers at the Bhandarkar Institute discovered?

- Researchers at the **Bhandarkar Oriental Research Institute (BORI), which houses South Asia's largest collection of manuscripts and rare texts,** claimed to have discovered new information on the renowned **Sanskrit poetess of ancient India, Shilabhattarika.**
- The researchers have established Shilabhattarika as the daughter of the **Chalukyan Emperor Pulakeshin II of Badami** in present-day Karnataka.
- According to noted Sanskrit scholar and registrar and curator at BORI, Dr. Shreenand Bapat, it was now reasonably certain that Shilabhattarika was a Chalukyan princess and the daughter of **Pulakeshin II, who reigned between 610 – 642 CE and had famously defeated the ruler of Kannauj, Harshavardhana, in battle on the banks of the Narmada in 618 CE.**
- Dr. Bapat stated that a copper charter containing five copper plates from the time of **Vijayaditya, a Badami Chalukyan ruler who reigned between 696 and 733 CE**.
- The charter had five plates measuring 23.4 x 9.4cm, held together by a copper ring bearing a **Varaha (boar) seal, which is the trademark seal of the Badami Chalukyan empire.**
- The charter contained 65 lines of **Sanskrit text inscribed in the late-Bhrami script**.
- Dr. Bapat, who worked through the genealogies of the Chalukyans and the Western Ganga dynasties, claimed that the decipherment of the inscriptions on the copper plates raised new light on Shilabhattarika, who stood out as a

poetess in the male-dominated-field of Sanskrit poetry in ancient India.

- A primary reading of the plates revealed that **Vijayaditya had donated the village of Sikkatteru in the Kogali Vishaya to a Vedic scholar Vishnusharma** in the month of Megha, Shaka year 638 which corresponded to the year 717 CE.
- **Sikkatteru was identified as Chigateri in Kogali in Karnataka's Vijayanagara district** by renowned epigraphist, Prof. Shrinivas V.Padigar.
- The plates revealed that King Vijayaditya Chalukya had donated the village of Chigateri at the request of Mahendravarma, the son of Shilabhattarika, the daughter of Satyashraya.
- **Although other Chalukyan rulers affixed the title of Satyashraya, which means patron of truth, to their names, Dr. Bapat claimed that Pulakeshin II was the only ruler known purely by the title**.
- The plates state that Satyashraya or Pulakeshin II was the great-grandfather of Vijayaditya and his daughter Shilabhattarika was married to Dadiga, a prince of the Ganga lineage of Talakkad.
- The plates also mention the names of Shilabhattarika's father-in-law **Mokkara or Mushkara, who ruled till 604 CE, and his father Durvinita(529-579 CE) who was the most important ruler of the Western Ganga dynasty.**
- Mokkara was succeeded by his eldest son Polavira as ruler while his younger son and Shilabhattarika's husband, Dadiga was made Governor of Kogali and succeeded by his son Mahendravarman, who was estimated to be around 70 when the copper plates were issued.
- The **Gangas acted as subordinates to the Chalukyas of Badami and also fought against the Pallavas of Kanchi.**
- The Pallavas, who were the arch-enemies of the Chalukyas of Badami eventually defeated and possibly **killed Pulakeshin II in 642 CE in the invasion led by the Pallava ruler Narasimhan I.**

Who was Shilabhattarika?

- Shilabhattarika was a Sanskrit poetess of the 9th Century who was believed to have lived near the Narmada and the Vindhyas.
- It has been speculated that she is the same as **Shilamahadevi, the queen of the 8th Century Rashtrakuta ruler Dhruva.**
- She is the daughter of the famous Chalukyan emperor Pulakeshin II and the wife of Dadiga, the governor of Kogali.
- She has written around 46 poems on topics such as love, morality, politics, nature, beauty, seasons, anger, codes of conduct, and the characteristic features of heroines.
- Her works were mainly of the **Panchali style of literature** and inspired many poets including the Marathi poet, **Shanta Shelke, whose song "toch chandrama nabhat"** draws inspiration from Shilabhattarika's works.

Badami Chalukyas

- The **Badami Chalukyas** were the earliest Chalukyas who reigned from the middle of the 6th Century.
- Their capital was located in **Badami, also known as Vatapi** in Karnataka.
- **Jayasimha is considered the first ruler of the Chalukyas but Pulakeshin I is considered to have established the Chalukyan empire**.
- The Badami Chalukyan rulers included:
  - Pulakeshin I (543 - 566 AD)
  - Kiritivarman I (566 - 597 AD)
  - Mangalesha (597 - 609 AD)
  - Pulakeshin II (609 - 642 AD)
- The **empire reached its peak during the reign of Pulakeshin II, following whose death, the empire declined**.
- The Badami Chalukyas were succeeded by the **Eastern Chalukyas who reigned till the end of the 11th Century from their capital of Vengi**.

To know more about the Chalukyas, click the link.

Chalukya Empire at its peak
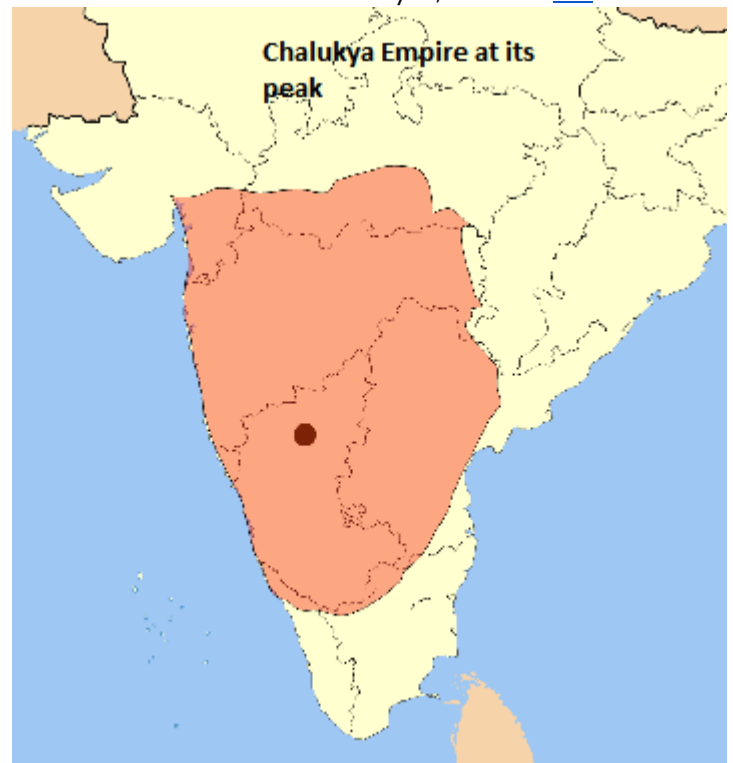
How are the inscriptions important?

- Aside from the genealogies revealed by the plates, it also increases the focus on Shilabhattarika and her poetry.
- More than 40 of Shilabhattarika's verses are considered to be extant or still in existence.
- **Rajashekhara, the 9th-century critic** lauds her compositional style in his works and states that Shilabhattarika's work follows the Panchali style that calls for a balance of the word with its meaning.

- Rajashekhara lauds her as an equal of the **famous poet of Harshavardhana's court, Banabhatt.**
- The decoding of the inscriptions provides fresh insight into how Shilahattarika might have acquired an understanding and proficiency in the composition of Sanskrit poetry that rivaled that of the stalwart male poets of the era.
- The Chalukyas of the Badamis and the Western Gangas were great patrons of art and literature.
- Shilabhattarika's great-grandfather-in-law Durvinita was a proficient composer and patron of **Bharavi, the author of the classical epic Kiratarjuniya**.
- Shilabhattarrika's expertise in Sanskrit poetry was facilitated by the rich literary traditions of both dynasties.

GENERAL STUDIES 2

Indian Polity

The Importance Of Constitutional Punctuality

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Indian Polity

Prepp Mains Booster: Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure, Comparison of the Indian constitutional scheme with that of other countries.

Context:

- Recently, the Legislative Assembly of Tamil Nadu passed a resolution seeking to establish a timeframe for the Governor to act on bills passed by the legislature.
- The Supreme Court stated in a petition filed by the government of Telangana against the state Governor that Governors should not sit on Bills indefinitely.
- A time-bound constitutional delivery mechanism was necessary to protect the sovereignty of the legislatures and preserve parliamentary democracy.

Recent clashes between Governments and Governors

- The Legislative Assembly of Tamil Nadu passed a resolution related to **Constitutional Punctuality** seeking to provide a timeframe for the Governors of the states to act on bills forwarded to them after being passed by the legislature.

- According to the Government, the Governor had withheld assent to around 13 bills that had been passed by the Assembly.
- The resolution proposed by the Chief Minister of Tamil Nadu and passed by the Assembly **urged the President and the Union Government to advise the Governors to decide on bills within a reasonable time period.**
- The resolution stated that this was necessary to **protect legislative sovereignty and preserve Parliamentary democracy**.
- The Chief Minister wrote to his counterparts in other Opposition-ruled states and encouraged them to pass similar resolutions in the State Assemblies. Kerala, West Bengal, and Delhi have expressed support for the resolution and its underlying principles.
- The Telangana State Government had filed a writ petition before the Supreme Court seeking directions to the governor to decide on bills passed by the legislature in a timely fashion.
- The idea of **constitutional punctuality was not limited to the Office of the Governor alone and could be expanded to include other Constitutional Offices such as the President and Speakers on a suo-moto basis to ensure the timely discharge of their duties.**

Evolution of the Constitutional Scheme

- When the Constitution was adopted following India's Independence from British Rule, some of the sovereign functions of the colonial governance system were retained in order to ensure continuity of governance.
- Consequently, no time periods were fixed for the discharge of the constitutional duties of various authorities.
- The **drafters of the Constitution expected Governors to be distinguished and non-partisan persons who would discharge their sovereign duties without being influenced by political interests**. As a result, they may have felt that a time limit on the performance of their duties was unnecessary.
- As per **Article 200 of the Constitution, the options available to the Governor when a bill is forwarded to their office are to give assent, withhold assent or reserve the bill for the consideration of the President.**
- However, Governors have misinterpreted this provision that grants them the power to assent to bills to have also endowed them with discretionary powers.
- The Governors have considered themselves to be unaccountable to the principles of time-bound governance as there is no time limit prescribed by the Constitution to return the bill.
- The direct import of the words of the Constitution and a reading of the Constituent Assembly debates on the topic reveal that this is not how the Constitution makers interpreted this provision.

- According to the original draft version of **Article 175** which was moved for discussion by the assembly in 1949, "Provided that where there is only one House of the Legislature and the Bill has been passed by that House, the Governor may, in his discretion, return the Bill together with a message requesting that the House will reconsider the Bill."

> - **Art 175 deals with the right of the governor to address and send messages to the House or Houses of the Legislature.**
> - The Governor may address either or both Houses of the Legislature of the State, or both Houses assembled together.
> - The Governor may send messages to the Legislature of the State with respect to a Bill pending in the Legislature or otherwise, and a House should consider any matter required by the message.

- On July 30th, 1949, Dr. B.R. Ambedkar, the Chairman of the Drafting Committee, while moving an amendment to the Article stated that there can be no room for a Governor acting on discretion and recommended the removal of the phrase "the Governor, in his discretion".
- As a result, the **final version of the Article which was adopted by the Assembly and included in the Constitution explicitly negates any discretionary powers of the Governor in giving assent to bills.**
- Therefore, it is clear that the phrase "withholds assent therefrom" of Article 200 has been misinterpreted to mean holding back the bills, also known as **pocket veto.**
- A straightforward reading of the Article reveals the Constitutional reality that withholding of assent only means to return the bill and not to indefinitely hold on to it.
- This has reiterated the need for a new constitutional architecture that would deliver on the demands for a time-bound constitutional delivery mechanism and thereby safeguard parliamentary democracy and the sovereignty of the legislative branch.

To know more about Governor's veto powers, click the link.

Similar provisions in other constitutions
- In the United Kingdom, the royal veto has not been used since Queen Anne vetoed the assent to the Scottish Militia Bill in 1708.
- **In the U.S.A., the President is bound by a time limit of 10 days to give assent or veto a bill. In case, he does not sign or veto the bill within ten days, it automatically becomes an Act.**
- The bill vetoed by the President returns to the Senate or the House of Representatives and then requires a two-thirds majority in both Houses of Congress to override the veto for it to become a law.

What has the Judiciary said on the matter?

- A seven Judge bench of the Supreme Court in the **Shamsher Singh & Anr vs State of Punjab (1974)** held that the **discretionary powers available to the Governor are extremely limited and even in the rare cases that it is used, it should not be detrimental to the interests of the state.**
- The Supreme Court has ruled repeatedly that the Governor is bound to act on the aid and advice of the Council of Ministers.
- In **Keisham Meghachandra Singh vs the Hon'ble Speaker Manipur (2020)**, the Supreme Court issued a writ of Mandamus to the Speaker of the Legislative Assembly of Manipur directing him to decide on petitions of disqualification under the Tenth Schedule within four weeks.
- While disposing of the writ petition filed by the Telangana government, the Supreme Court stated that the words " as soon as possible after the presentation of the Bill" in Article 200 were of constitutional significance and that Governors should bear this in mind and not sit on Bills indefinitely.

Conclusion
- It would be appropriate for Constitutional bodies such as the Governor when exercising powers under Article 200 and the Speaker when acting as a quasi-judicial tribunal under the Tenth Schedule to suo-moto evolve strict time-frames and avoid unnecessary delays in discharging duties.
- Such an approach mindful of the value of constitutional punctuality will help advance the Constitutional scheme and protect the will of the people expressed through the Legislature.

From Basic Structure To Collegium: A Shared Threat

Priority: High
Primary Source: Indian Express
Prepp Prelims Booster: Indian Polity
Prepp Mains Booster: Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Judgement & Cases

Context:
- Recently, the **Supreme Court's "basic structure doctrine" completed its 50th anniversary.**
- On April 24, 1973, in the landmark case of **Kesavananda Bharati v Union of India,** a 13-judge panel of the Supreme Court established the theory that requires the court to evaluate and limit Parliament's ability to change the Constitution's fundamental principles.
  - The **establishment of the collegium system** was also examined for the appointment of judges in India, which has been a subject of much debate and controversy.

The road to Kesavananda Bharati judgment
- **In the Shankari Prasad case (1951),** the Supreme Court decided that the Indian Parliament had limitless jurisdiction

to change the Constitution, implying that even individuals' fundamental rights may be revoked. In other words, if this precedent is followed in text and spirit, even the Indian Constitution might be abolished.

- However, in **Golak Nath's case (1967),** the Supreme Court ruled that abridgement of individuals' basic rights by amendment would be invalid. This led to the 24th amendment by which even fundamental rights could be repealed or amended. This was challenged in Kesavananda Bharati's case.

About Kesavananda Bharati Case

- Kesavananda Bharati Sripadagalvaru & Ors. v. State often known as the Kesavananda Bharati judgement, was a major Supreme Court of India case that articulated the fundamental structural theory of the Indian Constitution.
- The case is also known as the Fundamental Rights Case.
- In a ruling, the court in a 7-6 decision claimed its right to overturn constitutional changes that violated the core architecture of the constitution.

To know more about this topic, check Kesavananda Bharati Case

Basic Structure Doctrine

- The **basic structure doctrine has its origins in the German Constitution,** which was revised following the Nazi era to protect some core laws.
- As a result of that experience, the new German Constitution placed substantive restrictions on Parliament's ability to change specific elements of the Constitution that it deemed to be "fundamental law."
- The **basic structure doctrine has served as the foundation for judicial examination of all laws approved by Parliament in India.**
- The **concept of Basic Structure of the Constitution is nowhere explicitly mentioned in the Constitution.** It is a judicial innovation and was given its **shape by the Supreme Court in Kesavananda Bharati vs. State of Kerala case (1973).**
- The basic structure consists of **supremacy of the Constitution; republican and democratic form of government; secular character of the Constitution; separation of powers between the Legislature, the Executive and the Judiciary; federal character of the Constitution.**

What is Collegium?

- The process of selecting and removing judges has changed as a result of Supreme Court rulings rather than Acts of Parliament or Constitutional provisions, and the government only gets involved after the collegium has agreed on a list of candidates.
- The Chief Justice and four of the most senior members make up the **Supreme Court Collegium.**
- Chief Justice and four of the most senior justices make up the **High Court collegium.**

Appointment of Judges and Evolution of Collegium System

- The Supreme Court has given different interpretations of the term "consultation."
- **In the First Judges case (1981),** it was determined that consultation does not require agreement, but rather an interchange of ideas.
- **In the Second Judges case (1993),** the Supreme Court overturned its previous ruling, altering the definition of the word consultation to concurrence. The Second Judges Case (1993) curtailed the government's role by deciding that the Chief Justice of India will be chosen only by the Supreme Court's senior-most judge.
- **In the Third Judges case (1998),** the Supreme Court declared that the Chief Justice of India's consultation procedure necessitates "consultation with a plurality of judges."
  - The CJI's single opinion does not define the consultation process. He or she should consult a collegium of four senior Supreme Court justices, and even if two of them disagree, he or she should not pass the idea on to the government.
  - As a result of the "third judges case," the Collegium system was formed, and it has been in use since 1998 in the High Courts and Supreme Courts to nominate and transfer judges.
- **In 2015,** the Supreme Court applied Kesavananda's basic structure doctrine for the first time to fully strike down a constitutional amendment to alter the process of appointment of judges. The 99th Constitution Amendment

Act, often known as the NJAC Act, provided the government with a step towards the goal when it came to appointing judges.

Cases related to Basic Structure Doctrine

Shankar Prasad vs Union of India, 1951	• Initially, the judiciary believed that the parliament's amendment authority was unbounded since it could change any component of the constitution, including Article-368, which grants the parliament the ability to amend.
Golak Nath vs State of Punjab, 1967	• In this case, the Supreme Court formed a bench of 11 judges for the first time. In this decision, the court ruled that fundamental rights cannot be restricted or reduced to execute directive principles. • The government was forced to modify the constitution as a result of this ruling. The 24th Amendment Act of 1971 altered Articles 13 and 368 of the Constitution. • This change clarified that Parliament has the authority to amend any portion of the Constitution, including Fundamental Rights, and that the term "law" in Article 13 does not include a Constitutional Amendment Act.
Kesavananda Bharati vs State of Kerala, 1973	• It upheld the validity of the 24th Amendment Act and stated that Parliament is empowered to abridge or take away any of the Fundamental Rights. • At the same time, it laid down a new doctrine of the basic structure (basic features) of the Constitution and ruled that the constituent power of Parliament under Article 368 does not enable it to alter the basic structure of the Constitution. It meant that the Parliament cannot abridge or take away a Fundamental Right that forms a part of the 'basic structure' of the Constitution.
Indira Gandhi vs Raj Narain, 1975	• In this case, the Supreme Court struck down a clause of the 39th Amendment Act (1975) that barred all courts from hearing electoral disputes involving the Prime Minister and the Speaker of the Lok Sabha.

	• According to the court, this clause was outside Parliament's modifying competence because it changed the basic structure of the constitution.
Minerva Mills vs Union of India, 1980	• The 42nd amendment to the Constitution broadened the scope of Fundamental Rights. • The Supreme Court, however, threw down these restrictions in the Minerva Mills vs Union of India (1980) case, because it altered the Constitution's fundamental framework. • The Supreme Court stated in the Minerva Mills case that "the Indian Constitution is founded on the bedrock of the balance between Fundamental Rights and Directive Principles." • The Parliament may alter the Fundamental Rights in order to achieve the Directive Principles, as long as the amendment does not harm or destroy the Constitution's basic structure.

Significance of the Basic Structure Doctrine

• **Constitutionalism:** The basic structure doctrine attests to the concept of Constitutionalism in preventing the governing majority's brutal majority from destroying the core of the Constitution of India.
• **Ensuring Judicial Independence:** The Doctrine is critical in sustaining the independence of the judiciary since it prohibits any amendments that might jeopardize the separation of powers between the legislative, the executive, and the judiciary.
• **Uphold the Federal structure:** The Indian Constitution has a federal structure and is distinguished by traditional features of a federal system, such as the supremacy of the Constitution.
• **Democracy:** The core idea rescued Indian democracy by limiting constituent power; else, limitless power of parliament would have converted India into a totalitarian state.
• **Preservation of Fundamental concepts:** It aids in the preservation of the fundamental concepts of our constitution, which were painstakingly crafted by our founding fathers.
• **Separation of powers:** It strengthens our democracy by defining a real separation of powers in which the judiciary is distinct from the other two institutions. It has also given the Supreme Court unrivalled power, making it the most powerful court in the world.

- Recently, a three-judge Bench of Chief Justice D.Y. Chandrachud and Justices V. Ramasubramanian and P.S. Narasimha passed a judgment based on a petition filed by the All India Judges Association gave a series of directions to amend the service rules of the district judiciary and for payment of arrears of pension, additional pension, gratuity, and other retiral benefits.
- The Supreme Court has held that the **independence of district judiciary is part of the basic structure of the Constitution** and judicial independence from the executive and the legislature requires the judiciary to have a say in matters of finances.

Stalemate Over Krishna Water Share Of A.P. And T.S. Set To Continue Further

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Indian Polity

Prepp Mains Booster: Inter-State Relations, Dispute Redressal Mechanisms and Institutions, Tribunals

Context:

- Recently, at the Krishna River Management Board meeting, Telangana reiterated that it would not accept the 34:66 (TS: AP) ratio implemented since the bifurcation of Andhra Pradesh for one more year.
- Telangana claimed that it is entitled to 70% of the 811 tmcft allotted to combined Andhra Pradesh by the KWDT-1 Award.

What has Telangana claimed?

- At a recent meeting of the **Krishna River Management Board (KRMB),** Telangana (TS) unequivocally reiterated that it would not under any circumstances agree to the **34:66 (TS: AP) ratio** that had been forced on it since the bifurcation of erstwhile Andhra Pradesh(AP).
- Telangana also highlighted the fact that the judicious use of river water was one of the core planks of the Telangana statehood movement.
- In the absence of a resolution over the share in the water of the Krishna River between Telangana and Andhra Pradesh, the stalemate is set to continue into the next water year as well.
- In India the water year is from June 1st to May 31st of the following year.
- According to the Special Chief Secretary (Irrigation) of Telangana, the **state was entitled to a 70% share in the 811 tmcft allotted to undivided Andhra Pradesh by the KWDT-I (Krishna Water Dispute Tribunal) Award as per the basin parameters.**
- However, erstwhile AP had distributed it in a 512:299 tmcft (AP: TS) without protecting the in-basin requirements in the fluoride and drought-hit regions of Telangana and without considering the prudent needs of the region.

- Another senior official in the Irrigation Department stated that A.P. is diverting about 300 tmcft out of the 512 tmcft of water to areas outside the Krishna basin, treating it as a right and forgetting that it is a violation of the KWDT-I Award.
- The **KWDT-I had emphasized that the areas inside the basin should be prioritized over regions outside the basin even when taking up new project**s.
- Telangana made it clear to the KRMB that it would not be a party to the orders, issued by the Board without its consent, for the continuation of the existing 34:66 ratio.

What is the Central Government's Stand?

- As a result, the Chairman of the KRMB stated that the matter would now be forwarded to the Ministry of Jal Shakti (MoJS) for its intervention.
- Telangana has claimed that it would not settle for any less than equal sharing of water(50:50) until the finalization of water shares.
- According to Telangana, the **34:66 model was only an ad-hoc model for 2015-16 which was adopted with the clear intention that it would be reviewed on an annual basis.**
- However, this sharing model has been taken for granted by the KRMB and orders with the Board issuing orders implementing the same model every year.
- However, as a result of Telangana informing the Board that it did not have the power to force its unilateral decisions on parties, the Board has referred the matter to the Union Government.
- However, concerns have arisen that the MoJS is simply sitting on the issue despite its assurances at the Apex Council meeting in October 2020.
- The Center has so far not referred the matter to a new or existing tribunal for more than two years despite Telangana

withdrawing its petition in front of the Supreme Court on the Center's suggestion.

Apex Council
- The Apex Council was constituted by the Union Government for the supervision of the functioning of the Krishna River Management Board under Section 84 of the Andhra Pradesh Reorganization Act, 2014.
- The Council is composed of:
  o Minister of Water Resources, GoI (now Jal Shakti) as Chairman
  o Chief Minister of Andhra Pradesh and Chief Minister of Telangana as Members.

Krishna Water Dispute Tribunal
- The **First Krishna Water Disputes Tribunal (KRWDT)** was established in 1969 under the **Inter-State River Water Disputes Act, 1956** and its report was submitted in 1973.
- The order further stated that the tribunal's award could be amended by a competent tribunal after May 30th, 2000.
- **In 2004, the second KRWDT** was established and submitted its report in 2010 according to which, Krishna River water was allocated at 65% dependability and 177 tmc of excess flows going to Karnataka, 81 tmc to Maharashtra, and 190 tmc to Andhra Pradesh(undivided).
- The decision of the KWDT and a special report prepared in 2013 were both challenged by Andhra Pradesh in the Supreme Court.
- Following the formation of Telangana, Andhra Pradesh demanded that Telangana also be added as a separate party on the basis of **Section 89 of the Andhra Pradesh State Reorganization Act, 2014.**

Krishna Basin

Legal provisions regarding Water Disputes
- **Article 262:** As per Article 262, Parliament may by law provide for the adjudication of any dispute related to the use, distribution, and control of river waters in any inter-state river or river valley.

- **River Boards Act (1956):** It provides for the establishment of River boards by the Union Government for the regulation and development of inter-state rivers and river valleys.
- **Interstate River Water Disputes Act (1956):** The Act empowers the Central Government to set up ad-hoc tribunals for the adjudication of disputes between two or more states in relation to the waters of an inter-state river or river valley. **Neither the Supreme Court nor any other Court will have jurisdiction over any matter referred to a tribunal under this act.**

Krishna River
- The **Krishna or the Krishnaveni is the third longest river in India (1,288 km) and the fourth largest in terms of water flows and river basin area.**
- It is also the **second-largest east-flowing river in peninsular India**.
- It originates in the Western Ghats in the Satara district of Maharashtra, near Mahabaleshwar and flows into the Bay of Bengal.
- The Krishna's basin covers the South Indian states of Andhra Pradesh, Telangana, Maharashtra, and Karnataka.
- Krishna is bordered by the Western Ghats on the west, the Balaghat range on the north, and the Eastern Ghats on the south and east.

Tributaries:
  o **Left-bank:** Bhima, Dindi, Peddavagu, Musi, Paleru, Munneru.
  o **Right-bank:** Venna, Koyna, Panchganga, Dudhaganga, Ghataprabha, Malaprabha, Tungabhadra.
- The **Tungabhadra is the largest tributary of Krishna while the Bhima is its longest tributary.**
- The River basin includes black soils, red soils, laterite and lateritic soils, alluvium, mixed soils, red and black soils, and saline and alkaline soils.
- **Mineral Deposits:** The Krishna basin is known to be rich in deposits of oil & gas, coal, iron, limestone, dolomite, gold, granite, laterite, uranium, and diamonds.
- Important constructions on the Krishna include the **Prakasham Barrage, the Sri Sailam, Nagarjuna Sagar, and Basava Sagar dams.**

To know more about the Krishna River, click the link.

Delhi vs Centre Row: L-G Does Not Have Sweeping Executive Powers Over National Capital, Says Supreme Court

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Indian Polity

Prepp Mains Booster: Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure

Context:

- Recently, a Constitution Bench headed by Chief Justice of India D.Y. Chandrachud held that the **Lieutenant Governor (L-G) does not have sweeping executive powers** over the national capital, and the Centre should be mindful of the unique "asymmetric federal model" of governance adopted for Delhi.
- The unanimous ruling by a five-judge Constitution Bench, headed by Chief Justice of India DY Chandrachud, said the decision would further "the basic structure of federalism".
- The Union Government introduced an ordinance that seeks to amend the Government of National Capital Territory (NCT) of Delhi Act, 1991, and designates the Lieutenant Governor of Delhi as the administrator of Delhi who will have the final say on the postings and transfers of bureaucrats under the Delhi Government.
- The ordinance effectively negates the May 2023 verdict of the Supreme Court that gave the Delhi Government the power to make laws and wield control over bureaucrats deputed to the Delhi Government.

What is the new ordinance?

- The Union Government brought a new ordinance, **The Government Of National Capital Territory Of Delhi (Amendment) Ordinance, 2023, designating the Lieutenant Governor of Delhi (L-G) as the administrator of Delhi who will have the final say in the postings and transfers of bureaucrats** serving under the Government of Delhi.
- The ordinance was promulgated by the President to amend the **Government of the National Capital Territory of Delhi Act, 1991,** thereby effectively **negating the Constitutional Bench's verdict on the control of civil services in Delhi.**
- The ordinance seeks to establish a new body called the **National Capital Civil Service Authority (NCCSA)** which will be **headed by the Chief Minister of Delhi and include the Chief Secretary and the Principal Home Secretary of Delhi as its members.**
- All of the decisions taken by the NCCSA shall be on the **basis of a majority of votes by members present and voting.**
- The Authority has been empowered to decide the transfer, posting, and vigilance matters of all Group A officers and DANICS officers posted in Delhi.
- According to the ordinance, the L-G will pass orders to give effect to the recommendations of the NCCSA. The L-G has also been empowered to seek the relevant material with regard to the officers belonging to the All India Services and DANICS under the Government of Delhi.
- If the L-G differs with the recommendations of the NCCSA, either on the basis of the material requested or otherwise, the L-G may for reasons provided in writing return the recommendation to the Authority for reconsideration.
- The ordinance, therefore, provides that the **final decision on transfers and postings will lie with the L-G of Delhi,**

including in cases where there is a difference of opinion between the L-G and the NCCSA.
- The ordinance concluded that the Supreme Court had passed its verdict in the absence of any specific parliamentary legislation concerning the services.
- The ordinance added that any decision taken or event in the NCTD affects not just the residents of the national capital but all the country's citizens as well. These decisions also had the potential of affecting the country's reputation, image, credibility, and prestige on the international stage.
- The **national capital belongs to the country as a whole and it is in the larger public interest that the people of the entire country have a stake in the administration of the national capital through the democratically elected Union Government.**

Jurisdiction of the NCCSA

- According to the ordinance, the NCCSA has been empowered to make recommendations regarding:
  - Stability of tenure of public employees
  - Rotational transfers and postings from sensitive to non-sensitive posts and vice-versa
  - The suitability of an officer to be posted as Head of the Department;
  - Transfers and postings of all officers and other employees
- The NCCSA can make policies related to:
  - Capacity building of officers and other employees
  - Ensuring effectiveness in public services delivery
  - Ensuring good governance and e-governance in public administration Ensuring transparency in administration
  - Ensuring a citizen-centric administration
  - Any other related matter

What had the Supreme Court ruled on the matter?

- The **Constitution Bench of the Supreme Court had in a unanimous verdict held that the Delhi Government possessed legislative and executive powers over the services except those related to land, police, and public order.**
- CJI D.Y Chandrachud who authored the judgment claimed that a constitutionally entrenched and democratically elected government needed to have control over its administration which comprises public officers posted in the services of a particular government, irrespective of whether that government was involved in their recruitment or not.
- The judgment had dismissed the Union Government's argument that it retained administrative control over the officers deputed to the Delhi Government.
- The **verdict reiterated that the Delhi Government would not have any control over services related to police, land, and public order in the NCT of Delhi under Entry 41 of the State List i.e. Public services.**

- The Court ruled that, as per **Article 239AA**, the Lieutenant Governor was bound by the aid and advice of the Council of Ministers of NCTD in relation to matters within the legislative scope of NCTD, which included entry 41.
- The efficacy of the State and the system of responsible government depended on a competent and independent civil service (permanent executive) that implemented the policies of the government.
- Therefore, the effectiveness of the civil services is predicated upon their relationship with the Ministers who formed the political executive.
- The court established a triple-level chain of collective responsibility in the governance of the capital.
- Under the **triple-level command, the civil servants are accountable to the Ministers, who are accountable to the Legislature, which is ultimately responsible to the electorate.**
- The Court ruled that the civil service has to come under the control of the Delhi Government, as it could otherwise lead to a situation where the will of the public is disregarded and the accountability of the bureaucracy to the legislative and the public could be diluted.
- On May 20th 2023, the Union Government filed a **review petition** against the Supreme Court's verdict that the Government of Delhi has legislative and executive powers over administrative services in the NCTD and that the L-G is bound by the decision of the Delhi government.

Government of National Capital Territory of Delhi Act, 1991

- The **GNCTD Act was enacted in 1991** to supplement provisions of the Constitution corresponding to the Legislative Assembly and Council of Ministers for the National Capital Territory of Delhi.
- The **69th Amendment Act, 1992 added Articles 239AA and 239AB to the Constitution which granted the Union Territory of Delhi a special status**.
- The Amendment enables the creation of a **legislative assembly for Delhi** which is empowered to legislate on subjects under the State List and Concurrent List except those related to public order, land, and police.
- **Article 239AB** provides that the President may suspend the operation of any provision of Article 239AA or of all or any of the provisions of any law made in the pursuance of that article.
- The strength of the Council of Ministers shall not be more than ten percent of the total number of members in the Assembly, according to the Constitution.
- The President appoints the Chief Minister of Delhi and the other ministers on the advice of the Chief Minister.

Previous Amendment of the Government of National Capital Territory of Delhi Act, 1991

- In 2021, the Union Government introduced the **Government of the National Capital Territory of Delhi (Amendment) Act, 2021** to amend sections 21,24,33, and 44 of the 1991 Act.

Provisions:

o The Amendment Act redefined the term "government" in any law made by the Legislative Assembly to mean the L-G.
o The Amendment makes it necessary for the government of Delhi to obtain the opinion of the L-G before taking any executive action.
o The Amendment prohibits the Assembly or its committees from making rules to take up matters concerning the day-to-day administration, or to conduct inquiries related to administrative decisions.
o It provides for a Council of Ministers headed by the Chief Minister for the NCT to aid and advise the L-G in the exercise of his functions in matters in which the Legislative Assembly has the power to make laws.

What Is The SC Ruling On Sena Vs. Sena?

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Indian Polity
Prepp Mains Booster: Parliament and State legislatures—structure, functioning, conduct of business, powers & privileges and issues arising out of these, Structure, organization and functioning of the Executive and the Judiciary, Indian Constitution

Context:

- Recently, a Constitution Bench of the Supreme Court unanimously ruled that then Maharashtra Governor Bhagat Singh Koshiyari's call for a trust vote which led to the resignation of the Maha Vikas Aghadi government in June 2022 was illegal.
- The Court stated that the Speaker is the authority to decide disqualification petitions under the 10th Schedule and said that it could not ordinarily adjudicate disqualification petitions under the 10th Schedule.

What were the cases before the Supreme Court?

- In 2022, the MVA government was overturned and replaced by a government comprising a faction of the Shiv Sena claiming to be the real Sena, the BJP, and seven independent legislators.
- The leader of the breakaway faction, Eknath Shinde was chosen as the new Chief Minister of Maharashtra.
- A petition was filed before the court by Mr Shinde after notices were issued by Narhari Zirwal, the Deputy Speaker of the Maharashtra Assembly against 40 rebel MLAs under the **10th Schedule of the Constitution**.
- In response, petitions were filed by the Uddhav Thackeray group challenging the Governor's decision to call for a trust vote and the swearing-in of Shinde as the Chief Minister.
- Another petition challenged the election of the new speaker, Rahul Narwekar.

What is the verdict of the Supreme Court?

- A five-member Constitution Bench of the Supreme Court headed by CJI D.Y. Chandrahud unanimously ruled that the Governor of Maharashtra, Bhagat Singh Koshiyari's call for a trust vote, which led to the resignation of the Maha Vikas Aghadi government in June 2022 was illegal.
- The Court stated that the **Governor was not justified in calling on the then Chief Minister Uddhav Thackeray to prove his majority on the floor of the House.**
- However, the **Court said that it could not reinstate the MVA government and Thackeray as CM**, as he had resigned instead of facing the trust vote.
- In addition to the CJI, the Bench comprised Justices M.R. Shah, Krishna Murari, P.S. Narasimha, and Hima Kohli.

Was the Floor test justified?

- According to the Bench, the decision of the Governor to call upon the then Chief Minister to prove his majority in the House was not justified.
- This was because the **Governor did not have objective material-based reasons to conclude that the CM had lost the confidence of the House.**
- The Court also said that it was not possible to restore the status quo as Mr. Thackeray had not faced the floor test and resigned from the office instead.
- The Court further ruled that the governor was justified in inviting MrEknath Shinde to form the Government following the resignation of Mr. Thackeray.

Can the Supreme Court decide on a disqualification petition?

- The **Speaker of the Assembly is the authority to adjudicate petitions for disqualification under the anti-defection law(10th Schedule).**
- The petitioners requested the Court to decide on the matter of the disqualification of Mr. Shinde and his supporters.
- However, the **Court ruled that it cannot ordinarily adjudicate disqualification petitions under the 10th Schedule and that the situation was not an extraordinary**

circumstance that warranted the exercise of the Court's jurisdiction in order to decide the disqualification petitions.
- The Court further directed the Speaker to decide on petitions regarding disqualification within a reasonable time period.
- **According to the apex court, an MLA has the right to participate in House proceedings regardless of whether any petitions were pending regarding their disqualification.**
- The Bench opined that the validity of the proceedings in the House in the period between the regime change, also known as interregnum, was not subject to the outcome of the disqualification proceedings.

What did the Court rule on the role of the political party in relation to the legislature party?

- Another question posed before the court was related to the whip.
- The Court was asked which whip would be binding if the whip issued by the legislature party i.e. the Shinde faction and the political party gave different instructions to the members.
- According to the Shinde faction, the whip is appointed by the Legislature party.
- However, the **Court disagreed and stated that to claim the legislature party appoints the whip was equal to severing the metaphorical umbilical cord connecting a member of the House to the political party.**
- Such a position would mean that legislators could rely on political parties for the purpose of setting them up for election, organizing campaigns based on the strengths, weaknesses, policies, and promises of the party, and appeal to the voter on the basis of their affiliation to the party but later distance themselves and function as a group of MLAs who hold no allegiance to the political party.
- The **Court reaffirmed that the whip or directions to vote in a specified manner or abstain from voting were issued by the political party and not the legislature party.**
- The **Whip and the Leader of the party in the House are to be both appointed by the political party and not the legislature party.**
- On this basis, the Court ruled that the Speaker's decision recognizing Mr. Shinde as the Leader of the Shiv Sena in the House was not in accordance with the law.
- The Bench's judgment directed that the Speaker of the House shall recognize the whip and party Leader who are duly authorized by the Shiv Sena political party in line with the party's constitution after conducting an inquiry in this regard and in keeping with the principles discussed in the Judgement.

What is the 10th Schedule?

- The **Tenth Schedule** was introduced into the Constitution through the **52nd Amendment in 1985.**
- It was made necessary as frequent defections of elected representatives from one party to another had made good governance elusive and compromised the proper functioning of the Union and state governments.
- As per the Schedule, a member of the House belonging to any party is disqualified if;
  o He voluntarily surrenders his membership in the political party;
  o He votes or abstains from voting contrary to any direction issued by his political party without obtaining prior permission from the party and the act has not been condoned by the party within 15 days.
- Independent members are disqualified if they join any political party.
- Nominated members are disqualified if they join any party after six months from the day they took up their position as a Member of the House.
- All decisions on disqualification petitions are made by the Speaker or Chairman of the House, whose decision is final.
- **One exception made by the Schedule is when two-thirds of the members of a party decide to merge with another party, then neither the members who left nor the one who stayed with the original party attracts disqualification proceedings** under the Act.
- The Speaker is permitted to resign from his party when elected and rejoin when he has left the post.
- The 91st Amendment in 2003 deleted the provision that defection would not apply in case of a split in the party.
- In the **Kihoto Hollohan vs Zachillu and others Case of 1992**, the Supreme Court ruled that judicial review would not be available prior to the decision of the Speaker/Chairman in disqualification proceedings under the 10th Schedule.

To know more about the 10th Schedule, click here.

Government Policies & Interventions; Mechanisms, Laws, Institutions And Bodies Constituted For The Protection And Betterment Of These Vulnerable Sections, Issues Relating To Development And Management of Social Sector/Services Relating To Health, Education, Human Resources

Life Of 6,000 Villagers Set To Improve As 38 Villages In Odisha's Ganjam District Get 'Revenue' Status

Priority: Medium
Primary Source: The Hindu

Prepp Prelims Booster: Forest Rights Act
Prepp Mains Booster: Mechanisms, laws, institutions, and Bodies are constituted for the protection and betterment of these vulnerable sections; Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:
- Recently, the Ganjam district magistrate notified the conversion of 38 unsurveyed forest villages into revenue villages after approval from the Odisha revenue board.
- The Odisha government has set an ambitious target of completing implementation of **Forest Rights Act (FRA)** by granting all kinds of rights mandated under the historic Act by 2024.
  o A revenue village is a small administrative region with defined borders. One revenue village may contain many hamlets.

Why was there a need for recognition?
- **Access to essential services:** The majority of these villages lack essential amenities like water supply initiatives, educational institutions, Anganwadi centre, and most critically, all-weather roads.
- The **lack of a legitimate land record** in the villagers' names makes it impossible for them to get caste, resident, and income certifications.
- Without appropriate land records, **revenue officials are hesitant to acknowledg**e them as normal citizens and issue necessary certificates for pursuing education and availing government welfare benefits.
- They were dependent on the permission of the Forest Department.

What would be the Impact?
- **Recognition:** The Forest Right Act has **recognized 38 unsurveyed forest villages** in Odisha's Ganjam district as revenue villages.
- These villages were previously identified as **'Zero' villages in the census report,** meaning they existed but were not officially recognized, and required permission from the forest department for any developmental activity.
- **Access to essential service:** The recognition would provide over **6,000 villagers access to essential government welfare schemes** and developmental benefits.
- **Access to funds:** The Agriculture and Panchayati Raj departments would now be able to transfer funds smoothly for Mahatma Gandhi National Rural Employment Guarantee Act projects, crop planning, and diversification.
- The residents would easily obtain caste, residential, and income certificates based on their individual land titles.
- It is significant because in the past 16 years of implementing the FRA, only 52 forest villages, including the 38 in Ganjam, have been integrated into mainstream society. There are 39

unsurveyed villages in the Ganjam district, and only one of them is yet to be mainstreamed.

- As per the 2011 Census, there are 589 settlements with a population of 1.05 lakh situated inside various forests in Odisha. The colonial forest department had created 22 villagers for carrying out various forestry operations.
- As of the end of February 2023, 150 applications from 11 districts had been submitted for recognition as revenue villages.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act

- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, commonly known as the Forest Rights Act of India, is often referred to as the Tribal Rights Act or the Tribal Land Act.
- It addresses the rights of communities that live in forests, including Scheduled Tribes, to **land and other resources that have been withheld from them over time** due to the country's continued adherence to forest laws from the colonial era.
- Under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, **Gram sabha** shall be the authority to initiate the process for determining the nature and extent of individual or community forest rights or both

Significance

- For the first time, community rights and rights to common property resources (CPR) have been acknowledged.
- This legislation has highlighted individual rights of the marginalized and indigenous populations as well as other rights.
- The statute mentions converting all forest villages, old habitation villages, unsurveyed villages, and other villages into these, which has given rise to the idea of revenue villages.
- It enhances the **forest's conservation regime and guarantees** the livelihood and food security of other forest

dwellers as well as **Scheduled Tribes and Other Forest Dwellers.**

- The historic connections between marginal communities and community forest resources are safeguarded by monitoring and management of these resources.
- The way these communities have historically used the forest resource for sustainable development is well documented.
- In a manner, this law safeguards intellectual property rights as well as traditional ecological and cultural knowledge.
- It broadens the scope of the **Constitution's 5th and 6th Schedules**, which safeguard indigenous populations' claims to the lands and forests they call home.
- The 2006 Forest Rights Act **safeguards the rights of the displaced communities**. One of the causes of the Naxal movement, which had an impact on states like Chhattisgarh, Odisha, and Jharkhand, was the alienation of tribes.
- FRA 2006 also acknowledges and protects the ri**ghts of marginalized and indigenous groups over developmental operations.**
- The legislation will guarantee that individuals have the ability to manage their forests independently, which will limit official exploitation of forest resources, enhance forest governance, and improve management of tribal rights.

Fifth schedule

- The fifth schedule of the Indian Constitution deals with the administration and control of Scheduled Areas and Scheduled Tribes in India. Article 244(1) is directly related to Schedule 5.
- Ten states currently have Fifth Schedule Areas: Andhra Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telangana.

Tribes of Odisha

- There are sixty-two tribal communities living in Odisha. Together they form 22.1 percent of the total population of the State and 9.7 per cent of the total tribal population of the country.
- Among these, thirteen tribal communities are recognized as Particularly Vulnerable Tribal Groups or PVTGs. Their way of life is considered to be under threat due to depleting forest resources and the ingress of mainstream cultures into their region of habitation.

Indian Air Force Rescued 121 Indians From Wadi Seidna, North of Khartoum in Violence-Hit Sudan

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Events of national and international Importance

Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Indian diaspora.

Context:
- Recently, the Indian Air Force rescued 121 Indians from Wadi Seidna, north of Khartoum in violence-hit Sudan, on its C130J Hercules aircraft.
- The C130 has previously been used in Indian evacuation operations in Herat in 2020 and Kabul in 2021.

Indian operation in Wadi Seidna
- India conducted the evacuation of 121 Indians from **Wadi Seidna or Wadi Sayyidna**, located 40 Km north of Khartoum where the Sudan military and RSF have been fighting.
- The evacuation was performed on April I27-28th in the dead of night via the **Indian Air Force's C130J Super Hercules aircraft.**
- The evacuees, which included medical patients and a pregnant woman, were evacuated to Jeddah, Saudi Arabia.
- The Wadi Seidna airstrip had a degraded surface without any navigational approach aids or fuels, and landing lights required to guide an aircraft landing at night.
- The crew used **Electro-optical/Infra Red sensors to ensure the runway was free from obstructions and that there were no inimical forces in the region**.
- The aircraft also possessed synthetic runway generation on the head-up display using top-class onboard instrumentation which helped the crew land on the degraded airstrip.
- The crew also used night vision goggles(NVGs) to carry out a tactical approach and kept the aircraft running after landing while 8 IAF Garud commandos secured the passengers and their luggage. Takeoff was also executed using NVGs.

Evolution of Indian Special Operations
- India employed its standard operating procedures in place at the time during the **Kandahar incident of 1999 when an Indian Airlines aircraft en route to Kathmandu from Delhi, IC-814, was hijacked by terrorists.**
- The SOPs did not work and the aircraft landed in Kandahar leading to the release of terrorists.
- Some experts have stated that India should have emulated **Israel's rescue operation at Entebbe, Uganda in 1976** where Israeli forces stormed a hijacked Air France flight after flying over from Israel.
- However, such an operation could not be attempted due to two impediments - the presence of Pakistan, whose territory could not be flown over, and an alternative operation to enter Afghanistan from the south and return without refueling while avoiding Pakistani airspace was not possible.
- Following the introduction of the C-130J in the IAF inventory, India developed the capability to intervene in critical situations where national interests and political reputations are at stake.
- Prior to the rescue operation in Sudan, the C-130 has been used by India in two evacuation operations in Afghanistan.

- In Herat in 2020, Indian embassy personnel were emplaned on the C-130. In 2021, the IAF crew had to use NVGs in order to avoid other aircrafts in the air and land at their own risk in uncontrolled and chaotic airspace.
- The crew on both missions were felicitated with awards recognizing their professionalism and gallantry but recognition of the crew selection and their training was also necessary.

Essence of Special Operations
- Special Operations are more than stick and throttle operations, night vision goggles, and dark nights.
- Crew members of such operations are India's strategic corporals and bear the weight of India's prestige.
- The term **'strategic corporals'** was coined by General Charles Krulak of the U.S. Marine Corps. It denotes that in modern warfare, even the actions of even the enlisted man on the frontlines have a strategic effect on a nation's policies and that this should be accounted for by institutional training.
- Failed rescue operations like the U.S. attempt to rescue Americans from Iran in 1980 and the case of Gary Powers brought a loss of face for the U.S. while successful operations such as the elimination of Osama bin Laden brought laurels to the American special forces.

Evacuation Operations by India
- The Indian Air Force has two squadrons of special operations crew called the **Veiled Vipers and Raiding Raptors**.
- Other significant evacuation operations performed by India include
  - **Operation Ganga:** It was launched to bring back Indian stranded in Ukraine in 2020 following the Russian invasion of Ukraine.
  - **Operation Vande Bharat:** It was launched to bring back Indian citizens stranded abroad during the first phase of the Covid-19 pandemic.
  - **Operation Samudra Setu:** The operation targeted the return of Indian citizens via sea routes during the initial phase of the Covid-19 pandemic.

o **Operation Raahat:** It was conducted to bring back the thousands of stranded Indians in Yemen following the conflict between the Houthi rebels and the government in 2015.

o **Operation Maitri:** The Indian Army and the Air Force launched this joint relief and rescue operation in order to rescue victims of the 2015 Nepal earthquake.

o **Operation Safe Homecoming**: It was launched to bring back stranded citizens in war-torn Libya via an air-sea operation of the Indian Navy and Air India. In 2011.

o **Operation Sukoon:** Launched by India to rescue Indians and some Nepali and Sri Lankan citizens stranded following the Israel and Lebanon conflict in 2006. It is also known as the Beirut sealift.

o **Kuwait Airlift:** In 1990, India airlifted and repatriated over 1,70,000 Indians from Kuwait after Iraq invaded the country.

Conclusion

- There is a non-military intangible element in every military operation to be accomplished by young officers in action situations.
- The ethos and training received by the IAF's Special Operations squads should not be diluted by using the C-130 aircraft for routine tasks and VIP carriage.

Centre Prepares New Model Prisons Act With Focus On Reforms

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Indian Polity

Prepp Mains Booster: Government policies and interventions

Context:

- Recently, the Ministry of Home Affairs (MHA) has created the **'Model Prisons Act 2023,'** which would replace a British-era statute, i.e, Prisons Act of 1894 in order to improve prison management and focus on convict reformation and rehabilitation.

o Prisons in the country and 'persons incarcerated within' are a State matter, and the current legislation in this respect, the Prisons Act of 1894, is a pre-independence era Act that is about 130 years old.

About Model Prisons Act, 2023

- The new act's main goal is to reform and rehabilitate offenders while also overhauling prison management.
- A comprehensive 'Model Prisons Act, 2023' was finalized with the goal of holistically providing guidance and addressing the gaps in the existing Prisons Act, including the use of technology in prison management, making provisions for the grant of parole, furlough, remission to prisoners to encourage good conduct, special provisions for women/transgender inmates, physical and mental well-being of prisoners, and a focus on the reformation and rehabilitation of inmates.

- The model act has been submitted to the states and UTs for guidance.
- Prisons will be considered as reformative and correctional facilities under the new Act, with an emphasis on changing and rehabilitating convicts back into society as law-abiding individuals.

Provisions of the act

- The model Act includes provisions for punishing prisoners and jail staff for using prohibited items such as mobile phones in jails.
- The establishment and management of high security jails, open jail (open and semi-open), and provisions for protecting society from the criminal activities of hardened criminals and habitual offenders.
- It also includes provisions for giving legal advice to convicts and early release to encourage good behavior.
- The model Act provides for security assessments and segregation of convicts, personalized sentence planning, grievance redressal, a prison development board, attitude adjustment toward prisoners, and separate housing for women and transgender inmates, among other things.
- It also includes provisions for the use of technology in jail administration in order to increase openness, provision for video-conferencing with judges, scientific and technical interventions in prisons etc

Need of the new act

- **Outdated laws:** Existing laws, such as the Prisons Act of 1894, the Prisoners Act of 1900, and the Transfer of Prisoners Act of 1950, are out of date and must be amended.
- **Better prison administration:** The MHA identified various deficiencies in the present legislation and stressed the necessity for a correctional focus in prison administration.
- **Prisoner rehabilitation:** The current Prisons Act of 1894 lacks an emphasis on prisoner reform and rehabilitation.
- **Use of technology:** The legislation also includes the use of technology in prison administration and promotes the physical and mental well-being of convicts.

Government Measures for Indian Prisons

- **Modernisation of Prisons (MoP) Project:** The Government of India has decided to provide financial assistance to states and union territories through MoP for the use of modern-day security equipment in prisons in order to improve jail security and to facilitate the task of reformation and rehabilitation of prisoners through correctional administration programs.
- **E-Prisons initiative:** The E-Prisons initiative intends to improve jail management efficiency through digitalization.
- **Model Prison Manual 2016:** The document contains thorough information about the legal services (including free services) offered to jail prisoners.
- **Fast Track Courts:** Fast Track Courts (FTC) are courts that deliver rapid justice and are constituted following consultation with separate High Courts.
- **e-Courts projects:** Through the use of ICT, the initiative will simplify court processes and change the Indian judiciary. This will lessen judicial backlog and benefit plaintiffs.

Conclusion
The new comprehensive legislation may serve as a guide text for states to enact in their jurisdiction. Along with 'The Prisons Act, 1894,' 'The Prisoners Act, 1900,' and 'The Transfer of Prisoners Act, 1950,' and appropriate elements from these statutes were incorporated into the 'Model Prisons Act, 2023.'

Tracking SDG Progress The Bhopal Way

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: SDG
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation; Important aspects of governance, transparency, and accountability, e-governance- applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures. Inclusive growth

Context:
- Recently, the **city of Bhopal** has become the **first city in India to join** the growing global movement on the localization of **Sustainable Development Goals (SDGs).**
- Bhopal will now have voluntary local reviews (VLR) to demonstrate local government's capacity and commitments.
- In 2015, the 193 member-states of the United Nations adopted the 2030 Agenda for Sustainable Development, which consists of **17 Sustainable Development Goals** and **169 targets as a plan of action for 'people'**, 'the planet', and 'prosperity'.

Tracking SDG progress
- The United Nations' 2030 Agenda for Sustainable Development **specifies mechanisms** for the monitoring,

review, and reporting of progress as a measure of accountability towards the people.
- Member-states are required to **submit Voluntary National Reviews (VNRs)** to t**he UN's High-Level Political Forum (HLPF),** which provides an overview of their national efforts and progress in achieving the SDGs.
- In addition to VNRs, more recently, **Voluntary Local Reviews (VLRs)** have emerged as a means to drive and report the **local implementation of the SDGs at the sub-national and city levels.**

Tracking India's progress
- NITI Aayog presented **India's second VNR at the HLPF convened in 2020**.
  - Voluntary national review (VNR) is a process by which countries take stock and assess progress and challenges in the implementation of the Sustainable Development Goals (SDGs) of the 2030 Agenda.
- India's Ministry of Statistics and Program Implementation (MoSPI) has published **a National Indicator Framework (NIF)** for the review and monitoring of the SDGs, which contextualizes the **UN's Global Indicator Framework to represent** India's development journey.
- **local implementation:** At least 23 States and Union Territories have prepared a vision document based on SDGs according to the NITI Aayog report.
- Many states and Union Territories in India have taken **steps to localize the Sustainable Development Goals (SDGs)** and align their development plans with the SDGs, it has taken some time to reach India's first Voluntary Local Review (VLR) at the city level.

What are Voluntary Local Reviews (VLR)?
- Voluntary Local Reviews (VLRs) serve as a tool for cities to **showcase their local actions and contributions** towards equitable and sustainable transformations.
- **localizing Sustainable Development Goals:** Cities, local and regional governments worldwide are using VLRs to track and report on SDG progress.
- UN-Habitat views VLRs as powerful accelerators of the process of localizing Sustainable Development Goals.

- **Flexibility:** While it is ideal for a city to align its VLR with the State-level action plan and the country's VNR, the VLR allows a great deal of flexibility to the cities. Cities can choose their priorities for the VLR process, either by quantitatively a**ssessing their progress using city-level indicators** relevant to the SDG targets, or by providing a narrative that describes the city's efforts and vision.
- A VLR does not have to be exhaustive in quantifying each of the 286 indicators under India's NIF, which translate the global targets under the 17 SDGs into local indicators at the national level.
- The VLR process in India allows cities to **prioritize specific SDGs for review based on their capacity and resources**, rather than covering all indicators.
- It provides flexibility for cities to showcase their efforts and progress towards sustainable development in a targeted manner.
- A Voluntary Local Review (VLR) does **not necessarily have to be initiated solely by the local government.**
- It represents a process that involves various **city-level stakeholders and allows for the participation** of any interested party within the framework of Agenda 2030.
- For instance, in the city of Canterbury, UK, where residents and local groups formed a coalition to undertake the VLR, urging local governments to collaborate with city-level groups for SDG advancement. The local government merely served as an interlocutor in the VLR process.
- Similarly, in Dhulikhel (Nepal), Singra (Bangladesh), and Amman (Jordan), local governments in the global South published their VLRs with the involvement of various stakeholders.

Bhopal's VLR
- It is the result of a collaboration between the **Bhopal Municipal Corporation**, **UN-Habitat**, and a collective of over 23 local stakeholders.
  - UN-Habitat is the United Nations entity responsible for developing urban policies and translating them into action to create sustainable cities and human settlements.
- It has mapped **56 developmental projects to the SDGs** across the three pillars,
  - 'people' (SDGs 1,3,4,5),
  - 'planet' (SDGs 6,13,15) and
  - 'prosperity' (SDGs 7,8,11)
- The objectives of building basic infrastructure and resilience emerge as a priority for the city from the number of projects mapped to the SDGs.
- Bhopal has identified building basic infrastructure and resilience as key priorities based on the projects mapped to the SDGs.
- **Progress:** The city has achieved remarkable progress in solid waste management, public transportation, and open spaces per capita, as assessed under SDG 11.

- **Needs Work:** The analysis shows that areas where the city needs to work much **harder in the coming years to close the distance from the goals**: provisioning of adequate shelter, high levels of air pollution, city planning capacity, and even distribution and accessibility of open spaces.
- Mayor Malti Rai played a crucial role in recognizing the importance of the VLR and involving the community in the process.

Conclusion
- Cities are the most important stakeholders in Agenda 2030 as at least 65% of the 169 targets could not possibly be achieved without the engagement of local urban stakeholders.
- Voluntary Local Reviews is a remarkable opportunity for Indian cities to put their work on a global stage while utilising their own framework.
- It is hoped that more Indian cities will follow Bhopal's lead, to showcase urban innovations and collaborations.

For more information on SDGs- Sustainable Development Goals

Guardians Of The Ganga: Task Force Keeps A Watchful Eye On The River

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: NMCG
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation; GS3 - Conservation, Environmental Pollution & Degradation,

Context:
- Recently, a **Ganga Prahari (Guardian of Ganga)**, volunteer in the task force established by the **National Mission for Clean Ganga and the Wildlife Institute of India (NMCG-WII)** under the **Namami Gange program,** spotted an injured turtle among a heap of garbage and quickly transported it to a nearby rescue center for treatment.

Background
- Since 2014, **Namami Gange has worked to clean the river, environment, and surrounding villages,** which are home to 40% of India's population of 520 million people and 2,500 kinds of flora and wildlife.
- **The Namami Gange Program was named one of the top ten environment Restoration Flagships** involved in recovering the natural environment by the United Nations in December 2022 – a project in which the Central Government has invested $5 billion.
- **The Ganga Prahari project began in 2016.** The task force, which currently has over 4,000 volunteers in 100 districts throughout Uttarakhand, Uttar Pradesh, Jharkhand, Bihar, and West Bengal, monitors river preservation, prevents trash, and reports poaching.

Who are the Ganga Prahari?

- The Ganga Prahari, or Guardians of the Ganga, are **self-motivated and trained volunteers from the river's many villages.**
- They are part of the Namami Gange initiative, which was launched by the National Mission for Clean Ganga and the Wildlife Institute of India to clean and regenerate the river and its ecology.
- The Ganga Prahari aims to conserve wildlife and clean the river, with the ultimate goal of restoring the river's 'Nirmal' (clean) and 'Aviral' (uninterrupted) flow.
- The Ganga Prahari initiative is a one-of-a-kind example of community participation and empowerment for environmental conservation.

What was this initiative created?

- The **Ganga River's biodiversity is under threat** owing to limited water supply, habitat degradation, pollution, and excessive resource exploitation.
- To preserve the ecological integrity of the Ganga River and reduce direct dependency of local communities on the river, the **National Mission for Clean Ganga- Wildlife Institute of India (NMCG-WII) project 'Biodiversity Conservation and Ganga Rejuvenation' involved members of the local community known as "Ganga Praharis - River Guardians."**
- Ganga Praharis are largely volunteers from local communities who work to save aquatic life by maintaining the river's Aviral and Nirmal Dhara.
- The formation of this cadre was envisioned within the context of participatory conservation initiatives, where people interested in the process often reside in areas with high social cohesiveness and routinely collaborate on common community projects.
- The goal of this effort is to create a motivated cadre of "Ganga Prahari" to assist local level institutions and monitor the quality of the river's natural resources by organizing local communities at the grassroots level.
- Ganga Praharis are also regularly involved in Shram Daan, Ghat Cleaning, Awareness Campaigns, Plantation Drives and coordination with local administration.

About Namami Gange Project

- The Namami Gange Programme is an integrated conservation mission that was authorized by the Union Government of India in June 2014 as a flagship initiative to achieve the dual goals of effective pollution abatement and restoration and revitalization of the National River Ganga.
- It is a registered trust that runs the 'Namami Gange' mission, India's most ambitious endeavour to clean the Ganga river.
- The program's goal is to involve the community and link diverse interest groups, such as scientists, technology businesses, investors, and community members, in order to restore the Ganga River's purity and biodiversity.

What are the main pillars of the project?

- **Sewerage Treatment Infrastructure:** To build enough capacity to treat sewage and industrial effluents before they enter the river.
- **River-Front Development:** Enhancing the beauty and amenities of the ghats and crematoria along the river's banks.
- **River-Surface Cleaning:** The collection and disposal of floating solid waste from the river's surface.
- **Biodiversity Conservation:** To safeguard and restore the river ecosystem's endemic and endangered aquatic species.
- **Afforestation:** Increasing green cover and reducing soil erosion in the river's catchment region.
- **Public Awareness:** To educate and sensitize the people about the importance and advantages of a clean and healthy Ganga.
- **Industrial wastewater Monitoring:** Ensuring compliance and enforcement of environmental standards by industries that discharge wastewater into the river.
- **Ganga Gram**: To create model villages along the river with improved sanitation, waste management, and livelihood possibilities.

Ganga River System and its tributaries

- **Ganga River System originates from the Gangotri Glacie**r in the Garhwal region of the Himalayas at the height of 4100 meters above sea level.
- It is also known as Bhagirathi at the place of its origin.
- The mainstream of this river flows through the Himalayas and at DevPrayag two other streams- the Mandakini and the Alaknanda also join its course.
- The Ganga River System is mainly the combination of these three streams.
- This river, after covering a distance of 2525 km from its origin point, merges into the Bay of Bengal at Ganga Sagar in the state of West Bengal.
- The main tributaries of river Ganga are **Yamuna, Ram Ganga, Son, Damodar, Gomati, Ghagra and Sapta Kosi.**

Measure to keep River Ganga safe

- Raising awareness about the benefits of a clean and vibrant Ganga and instilling a sense of connection in people toward the Ganga River.
- Linking local people and their livelihoods to the broader efforts of numerous entities working for a clean Ganga, and so providing a convergence point at the grass roots level for such activities.
- Connecting local people's livelihoods and well-being to a clean and thriving Ganga.

What is the 'Open Network for Digital Commerce'?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: ONDC

Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation. changes in industrial policy and their effects on industrial growth.

Context:

- The Union government is looking to **formally launch the Open Network for Digital Commerce (ONDC)** this year to "**democratize e-commerce**" and **"to provide alternatives** to proprietary e-commerce sites".
- The government has been urging major e-commerce players such as **Amazon** and **Flipkart to join ONDC**. However, these companies have been reluctant to do so, citing concerns about the impact on their businesses.
- Commerce Minister Piyush Goyal recently asked these companies to join ONDC soon or risk being left behind.

What is ONDC?

- Open Network for Digital Commerce (ONDC), is an initiative of the **Department of Promotion of Industry and Internal Trade (DPIIT)**
- ONDC is **a network built on the BeckN protocol** that aims to promote interoperability.
- It provides an opportunity for various platforms, **regardless of their size, to connect and function smoothly.**
- It aims to **eliminate barriers in digital commerce** by allowing different configurations of platforms to operate together.
- This network consists of different participants, such as Buyer Applications, Seller Applications, and Gateways, which facilitate search and discovery.
- Imagine a situation where **all major e-commerce platforms**, including food delivery, fashion, and transportation, are available **in one place alongside local startups, shops, and small Kirana stores.**
- Under ONDC, a buyer registered on Amazon, for instance, might buy products straight from a vendor selling on Flipkart. The government has mandated that businesses identify themselves on the ONDC in order to make such transactions a reality.

- Many retailers have already joined the site since the pilot edition of ONDC started last year in a few major cities. Amazon and Flipkart, however, have not on-boarded their main shopping platforms onto the ONDC network yet.
- The **ONDC entity, a not-for-profit company incorporated** under Section 8 of the Companies Act 2013, manages and operates the ONDC Network.
- It is responsible for building and maintaining the underlying infrastructure (common registries and protocols) as well as defining the rules of engagement and code of conduct for the Network Participants through the ONDC Network Policy and the ONDC Network Participant Agreement.

Objectives:

- Democratization and decentralization of eCommerce
- Inclusivity and access for sellers, especially small and medium enterprises as well as local businesses
- Increased choices and independence for consumers

Advantages

- **Democratization of e-commerce:** The government wants to change the fundamental structure of the e-commerce market from the **current "platform-centric model to an open-network model"**.
- The ONDC is modeled after the **Unified Payments Interface (UPI)**.
- The UPI **allows people to send or receive money irrespective** of the **payment platforms** on which they are registered.
- The government wants to ensure that buyers and sellers of goods in the e-commerce market can transact regardless of the platforms on which they are registered.
- **Reduce domination of large entities:** The government views the ONDC as a solution to counter the dominance of a few large e-commerce platforms in the market.
- **Interoperability:** According to the government the e-commerce market is currently broken into **"silos" operated and dominated by private platforms**.
- For instance, Amazon and Flipkart, have been accused of promoting certain seller entities in which they hold indirect stakes.

- Food delivery apps such as **Swiggy and Zomato** have been accused of **charging high commissions from sellers.**
- **level playing field:** The government aims to establish an open network that connects buyers and sellers across multiple platforms and to create level a playing field by reducing the reliance on dominant private platforms.
- **Inclusivity:** ONDC takes a more representative and multistakeholder approach to governance that prioritizes the evolving needs of its users.

Criticism

- Doubts have been raised by critics regarding the potential advantages of an open network for digital commerce.
- They argue that the **current platform-**centric e-commerce model already allows **sellers to list products on multiple platforms** and the services like price comparison bridge the information gap and help buyers make better decisions.
- According to critics the domination of the e-commerce market by Amazon and Flipkart may not be due to any captive hold that these platforms have over buyers and sellers. The supposed platform monopoly is seen as no different from the limited monopoly any business has over its property.
- Platforms invest in exclusive onboarding and listing processes, but if the rules of the open network **prevent them from benefiting, they may stop making such investments.** This could i**mpact service quality for consumers**, making it a key challenge for ONDC to build an efficient marketplace.

Way forward

- Despite a few shortcomings, ONDC will develop the e-commerce ecosystem from an operator-driven platform-centric model to a facilitator-driven interoperable decentralized network by digitizing the entire value chain, ONDC would not only standardize operations but also ultimately promote local supplier inclusion, curb digital monopoly, drive logistic efficiencies, and enhance consumer value.

The Lack Of A Drug Recall Law In India

Priority: High
Primary Source: The Hindu
Prepp Prelims Booster: Health
Prepp Mains Booster: Issues relating to Health, Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:

- Recently, **Abbott, a multinational pharmaceutical firm, issued a public notice in newspapers alerting consumers to a mislabeled batch of medicine** that it had unintentionally distributed to the market.
- While such recalls are common in the United States, even by Indian companies, **India has never seen domestic or international pharmaceutical companies recall inferior or mislabeled pharmaceuticals.**

- The disparity in the behavior between India and the United States is that the country's law in the US mandates pharmaceutical corporations to recall batches of pharmaceuticals from the market if they fail to fulfill quality requirements.

What is Drug Recall policy?

- A drug recall policy is a set of procedures and guidelines that govern the removal of a drug from the market due to safety concerns, manufacturing defects, or other issues.
- A drug recall is a voluntary or mandatory action taken by a pharmaceutical company or regulatory agency to remove a product from the market that may pose a risk to public health.
- The policy outlines the steps that pharmaceutical companies should take when a drug is found to be defective or unsafe, including notifying regulatory agencies, healthcare professionals, and consumers, conducting investigations to determine the cause of the problem, and taking appropriate corrective action.

What are the issues with drug regulations in India?

- In India, the division between small and serious transgressions is not scientific. Because dissolution, disintegration, and impurity failures are considered minor offenses, states do not pursue them.
- **Liberal punishments:** A lack of proper penalties and punishment has made pharmaceutical-related criminality more visible.
- **Competition:** Because the government of India has included the pharma sector as an innovative criterion for state rankings, it has created a race to establish medications and the pharma business.
- **Interstate diversity in prosecution:** The differences in drug control and quality control regulations between states make analyzing the true problem challenging.

India's effort so far

- **Drugs Consultative Committee (DCC):** It includes all state drug controllers as well as top bureaucrats from the Ministry of Health and the national drug regulator, the Central Drug Standard Control Organization (CDSCO), addressed drug recalls in 1976.
- **Parliamentary Standing Committee on Health & Family Welfare:** In 2012, after a scathing report by the Department Related Parliamentary Standing Committee on Health & Family Welfare raised the issue of recalls, among other issues.
- **Central Drug Standard Control Organization (CDSCO):** It produced a set of draft recall rules, but the national regulator lacks the authority to turn the suggestions into official law. Only the Ministry of Health, or, more specifically, the Drug Regulation Section of the Ministry, can commence the process of developing enforceable regulations or laws.

- **Drug Controller General of India (DCGI):** It had claimed that the instructions would become binding law but this never occurred.
- **Drugs Technical Advisory Board (DTAB):** It also discussed issues related to recall on drugs but India still lacks a recall law.

Suggestion to improve drug failure

- **Improve quality control:** India needs to ensure that medicines entering the market meet certain quality standards. This can be achieved by implementing strict quality control measures and ensuring that all drugs are tested before they are made available for sale.
- **Increase awareness:** It's important to educate consumers about the risks associated with taking failed medicines. This can be done by increasing awareness campaigns, especially in rural areas where access to information is limited.
- **Enhance regulations:** The government should strengthen the regulatory framework to ensure that pharmaceutical companies comply with the rules and regulations. This can be done by increasing the penalties for non-compliance and making sure that there is proper oversight of the industry.
- **Research:** The government can also encourage research into new drugs and therapies that can help address the issue of failed medicines. This can be done by offering incentives for companies to invest in research and development.
- **Improve post-market surveillance:** The government can strengthen the post-market surveillance system to monitor adverse drug reactions and ensure that any safety issues are addressed promptly. This can be done by setting up a robust pharmacovigilance system.
- **Effective recall mechanism:** To build an efficient recall procedure, the duty for recalling pharmaceuticals must be centralized, with one authority with the legal capacity to hold corporations accountable for failures to recall drugs from throughout the country, as well as to search and seize batches of failing medicine.

Safety, In The Line Of Duty: On Kerala's Move And Health-Care Workers

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Health
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation; Issues relating to Health

Context:
- Recently, **the death of a young house surgeon, Vandana Das, at the hands of an 'inebriated' patient** during a routine medical checkup in Kerala has not only stunned the community but also reignited concerns among health-care personnel about their own safety.
  - The Kerala government has decided to **amend the Kerala Health Care Service Persons and Health Care Services Institutions (Prevention of Violence and Damage to Property) Act, 2012** to ensure the safety of healthcare workers.

Challenges Faced by Doctors in India
- **Medical negligence:** Doctors in India are frequently accused of medical carelessness, which can result in legal action and compensation claims. Medical negligence is defined as a doctor's failure to offer reasonable care and competence in the treatment of a patient, resulting in harm or injury to the patient.
- **Criminal Charges:** Doctors in India may face criminal charges for medical misconduct, fraud, or other offenses. Criminal charges might result in fines, imprisonment, or the suspension of a medical license.
- **Harassment and Violence:** Doctors in India experience harassment and violence from patients and their families. This can result in bodily pain, emotional suffering, and a loss of reputation.

Factors associated with violence against healthcare workers in India
- **Lack of awareness and education:** Inadequate public awareness about the rights and responsibilities of healthcare workers can contribute to incidents of violence. Misunderstandings regarding treatment outcomes, delays, or dissatisfaction may lead to frustration and aggression towards healthcare personnel.
- **Communication gaps**: Poor communication between healthcare providers and patients or their families can escalate tensions and increase the likelihood of violence. Language barriers, limited access to interpreters, or ineffective communication skills on the part of healthcare workers can exacerbate the situation.
- **Inadequate security measures:** Insufficient security arrangements within healthcare facilities can make healthcare workers vulnerable to violence. Lack of trained

security personnel, surveillance systems, or emergency response protocols can compromise the safety of healthcare workers.

- **Cultural and social factors:** Cultural beliefs, social norms, and attitudes towards healthcare providers can influence the occurrence of violence. Factors such as gender inequality, hierarchical structures, and distrust in the healthcare system may contribute to violent incidents.
- **Legal and regulatory gaps:** In some cases, the absence of strong laws and regulations specifically addressing violence against healthcare workers can contribute to impunity for perpetrators and a lack of deterrents.

What are the initiatives for protection of healthcare workers?

- **The Medical Protection Act (MPA):** It protects doctors connected with institutions as well as individual practitioners, makes assaults against physicians and damage to their property illegal. Offenders might face up to three years in prison and a Rs 50,000 fine.
- **The Health Services Personnel and Clinical Establishments (Prohibition of Violence and Property Damage) Draft Bill, 2019:** The draft bill recommended three to ten years in prison and penalties ranging from Rs 2 lakh to Rs 10 lakh for "grievously hurting" physicians and other healthcare staff in clinical settings.
- **The Occupational Safety, Health, and Working Conditions Code, 2020:** It specifies the roles of employers and employees and envisions safety requirements for various sectors, with an emphasis on worker health and working conditions, working hours, and leaves, among other things.
- **Article 21 of the Indian Constitution:** The Supreme Court has ruled that the right to live in dignity, entrenched in Article 21, emanates from the fundamental principles of state policy and hence encompasses health protection.

What safety measures are being taken by the Kerala Government?

- The Kerala Government has suggested to the state government a variety of measures, including the installation of CCTV cameras and the deployment of ex-servicemen, to increase hospital security and allow physicians to treat patients without fear.
- The government has also agreed to establish police aid stations at all major hospitals, and all hospitals shall conduct monthly security assessments.
- The draft amendment to the Kerala Healthcare Service Persons and Healthcare Service Institutions (Prevention of Violence and Damage to Property) Act, 2012 proposes increasing the penalty for attacks on healthcare workers and institutions to seven years in prison and a fine of up to Rs 1 lakh.
- It has also recommended fast-track or designated courts to handle such matters.

- The Kerala Health Care Act, 2012 will be strengthened with stricter punitive penalties for offenders of violence against health professionals and facilities.
- As needed, the definitions of health-care facilities and health-care personnel will be broadened or amended.

Why India Went Nuclear 25 Years Ago

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: Events of National Importance
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation, India and its neighborhood-relations

Context:

- The author, C Uday Bhaskar, Director of the Society for Policy Studies, has discussed India's evolution as a nuclear weapon power in the article titled "Why India Went Nuclear 25 Years Ago" published in the Indian Express on 16th May 2023.
- Over the last 25 years, India has honed its weapons of mass destruction capabilities but also maintained its commitment to the principle of no first use.

India as a nuclear weapons state

- On May 11, 1998, India under Prime Minister Atal Bihari Vajpayee declared itself a nuclear weapons state by carrying out a series of three nuclear detonations.
- The detonations included a 45 kt thermonuclear device, a 15 kt fission device, and a 0.2 sub kt device.
- A second test was conducted two days later, and having attained the necessary degree of techno-strategic capability, India imposed a moratorium on further testing.
- The 25th anniversary of the **tests codenamed Shakti** is an opportunity to assess the nuclear issue across the national, regional South Asian, and global frameworks.
- India's nuclear tests took the world by surprise, with the USA and China denouncing New Delhi for its refusal to be tied down as a non-nuclear weapon state under the provisions of the **Non-Proliferation Treat**y, which India has still not signed.
- Consequently, sanctions were imposed on India by the USA and its allies.
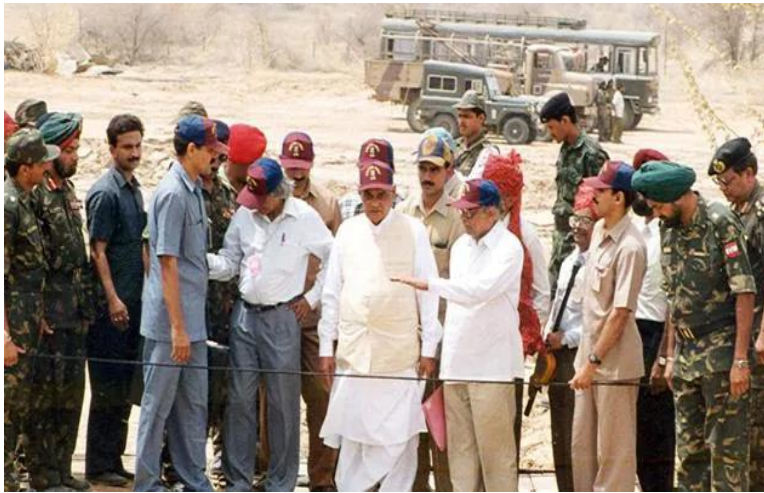
What were the reasons for India's nuclear tests?

- **According to the US and its allies, the primary motivation behind India's nuclear tests, which had been suspended since the peaceful tests of 1974, was prestige and a desperate desire to be included as a part of the five-member nuclear clu**b.
- In the immediate aftermath, South Asia was described as the most dangerous place in the world and India was blamed for it.
- However, it is now clear that the prestige argument was invalid and deviously concealed the strategic and security compulsions that forced India to act.
- In order to satisfy the nuclear insecurity of the USA and its allies, the US security establishment and most academics and think tanks adopted a **red herring approach.**
- In order to maintain the sanctity of the nuclear club, the strategy deemed that India does not require nuclear weapons to maintain its security.
- Another trigger behind India's nuclear weapons tests was the **presence of non-friendly nuclear weapons states** in its immediate neighborhood.

Nuclear Weapons in India's Neighborhood

- China acquired nuclear weapons in 1964 as part of its strategic policy due to its tense ties with both the USA and the USSR.
- The presence of a nuclear-powered China in its neighborhood was a grave concern for India, given the trauma of the war of 1962.
- In the mid-1960s India's worries were aggravated as a result of the opaque **strategic partnership between China and Pakistan** that focussed on nuclear weapons as a tool to advance their shared security interests, which were inimical to India's.
- Under the covert operation, which was supported by Pakistan's political establishment, Pakistani scientists who had unfettered access to Western nuclear technology shared designs and blueprints with the Chinese.

- This was particularly beneficial for China, which had strained relations with both the USA and the USSR at the time.
- According to experts the **Pakistani policy of attaining nuclear weapons even if it meant eating grass** was successful and Pakistan acquired nuclear weapons through China in the late 1980s.
- This also enabled the two countries to conduct a secret test to validate the warhead design in Lop Nor in May 1990.
- The USA, which was monitoring the Sino-Pak alliance chose to keep it concealed and in pursuance of its red herring strategy, fabricated an India-Pakistan nuclear crisis in May 1990.
- The Indian security establishment, aided by successive political regimes, had to operate amidst the stark reality that two of its non-friendly neighbors possessed nuclear weapons and attempted to bridge the asymmetry.

No First Use Doctrine

- India has honed its **WMD (weapons of mass destruction)** capacity over the last 25 years while maintaining its commitment to the **doctrine of No First Use (NFU)**.
- According to the **No First Use policy, India will not attack another nation with its nuclear arsenal unless attacked first by the enemy nation using nuclear weapons.**
- India's strategy regarding the use of nuclear weapons is based on the belief that the **singular purpose or core mission of nuclear weapons is to deter the use of similar capabilities.**
- The Indian approach of deterrence based on which the political leadership has arrived at a level of sufficiency in terms of quality and quantity of nuclear weapons, is therefore in line with the country's pacifist DNA and strategic culture.
- India has rejected the use of nuclear weapons as military tools of **counterforce strategy like the US and USSR.**
- Instead, India aimed to use them to caution potential adversaries not to embark on a potential Hiroshima as the Indian retaliation was designed to inflict catastrophic damage.
- In this light, the use of nuclear weapons by either of the three nuclear states of South Asia could result in a nuclear apocalypse that would engulf the entire region.
- Critics of India's NFU doctrine have recommended that India adopt a counterforce approach, but a rational cost-benefit analysis of the situation reveals that the deterrence approach is more prudent for both India and the South Asian regions as well.
- An effective deterrence strategy is subject to the reality of the entire WMD infrastructure from the Prime Minister to the strategic forces command, which makes ensuring that the appropriate levels of efficacy are maintained a complicated task.

- Other aspects that need to be addressed by India include the role of the Defense Minister in the nuclear ladder and the changes as a result of the introduction of the CDS and simulations conducted to ensure the civil-military command is well prepared.
- India's commitment to the NFU doctrine and the principle of deterrence must remain resolute amid the nuclear saber-rattling that is becoming more pronounced lately due to tensions between nuclear powers like the USA, China, and Russia.

India's Nuclear Doctrine

- Maintaining a **credible minimum deterrence.**
- The policy of "**No First Use**".
- Nuclear retaliation to a first strike will be massive and aim to inflict unacceptable damage.
- Nuclear retaliatory attacks are only authorized by the civilian political leadership through the three-tier Nuclear Command Authority.
- **Nuclear weapons will not be used against non-nuclear-weapon states.**
- India will retain the option of retaliating with nuclear weapons in the event of a major attack against India, or Indian forces anywhere, by biological or chemical weapons.
- Strict controls on the export of nuclear and missile-related materials and technologies, participation in the Fissile Material Cutoff Treaty negotiations, and continued observance of the moratorium on nuclear tests.
- **Commitment to the goal of a nuclear-weapon-free world**, through global, verifiable, and non-discriminatory nuclear disarmament.

To know more about India's nuclear policy, click the link.

A High Court Does Not Have the Power To Direct Changes In Scheduled Tribes List: CJI

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Indian Polity

Prepp Mains Booster: Separation of powers between various organs disputes redressal mechanisms and institutions; Mechanisms, laws, institutions, and Bodies are constituted for the protection and betterment of these vulnerable sections

Context:

- Recently, the Chief Justice of India D.Y. Chandrachud said that he was surprised that why a 23-year-old Constitution Bench judgment (State of Maharashtra Vs Milind), which held that no court or State has the power to "add, subtract or modify" with the Scheduled Tribes List was not "shown" to the Manipur High Court in the first place.
- This came after violent clashes and deaths that followed the Single Judge Bench of the Manipur High Court. It directed the State government to consider including the Meetei/Meitei community in the Scheduled Tribe list.

What does the Constitution say about amending the Scheduled Tribes list?

- As per **Article 342 of the Constitution,** the **President** is the sole authority to **notify tribal communities** as Scheduled Tribes, while the **Parliament** has the power to modify the **Scheduled Tribes list.**
- The President has exclusive power under Article 342(1) of the Constitution to **issue a notification specifying Scheduled Tribes,** and this list cannot be modified, amended, or altered by any State government, court, tribunal, or other authority.
- **State of Maharashtra versus Milind case:** In a November 2000 verdict in the State of Maharashtra versus Milind case, the **Constitution Bench** held that **only Parliament can amend the Scheduled Tribes list through legislation**.
- The bench further clarified that no tribe, sub-tribe, part of, or group within a tribe can be added or removed from the Scheduled Tribes list without parliamentary approval.
- The 5 Judge Constitution Bench held that the Scheduled Tribes Order **must be interpreted as it is** and cannot be expanded beyond the tribes specifically listed in the Order.
- **FCI versus Jagdish Balaram Bahira:** In a July 2017 judgment authored by Justice Chandrachud (at that time), a three-judge Bench of the Supreme Court in CMD, FCI versus Jagdish Balaram Bahira referred to the Milind verdict to affirm that the **Presidential Order under Article 342 with respect to Scheduled Tribes was always considered as "final".**

Who are scheduled tribes?

- The Constitution of India in Article 366 (25) prescribes that Scheduled Tribes means such tribes or tribal communities as are deemed under Article 342 of the Constitution to be Scheduled Tribes.

The provisions under Article 342 read as follows:

- **342(1)** Scheduled Tribes --- the President may with respect to any State or Union Territory, and where it is a State, after consultation with the Governor thereof, by a public notification, specify the tribes or tribal communities or part of or groups within tribes or tribal communities as Scheduled Tribe in relation to that State or Union Territory as the case may be.
- **(2)** Parliament may **by law include in or exclude from the list of Scheduled Tribes specified in a notification** issued under clause (1) any tribe or tribal community or part of or group within any tribe or tribal community, but save as aforesaid a notification issued under the said clause shall not be varied by any subsequent notification.
- Therefore, the President is the sole authority to notify tribal communities as Scheduled Tribes as per the Constitution of India, **with the Governor playing a recommendatory role.**

Criteria for identification of scheduled tribes

- The **Constitution does not specify the criterion** for the identification of ST communities.
- As a general convention, the recommendations of the **1965 Lokur Committee** are followed to **identify ST communities based on indicative criteria** such as primitive traits, distinctive culture, geographical isolation, shyness of contact with the community at large, and backwardness.
- As per the 2011 Census, there are over 700 recognized Scheduled Tribes in India in 30 states and Union Territories.
- Five states/UTs comprising Punjab, Chandigarh, Haryana, NCT of Delhi, and Puducherry have no listed STs at present.
- The Parliament is the sole authority to pass amendments to the Constitution to modify the lists whereas, the state governments play an advisory role,

What is the process to include tribes in the ST list?

- The process to include tribes in the ST list starts with the recommendation of the respective State governments, which are then sent to the Tribal Affairs Ministry, which reviews and sends them to the Registrar General of India for approval.
- The National Commission for Scheduled Tribes also monitors and approves the lists before it is sent to the Cabinet for a final go-ahead.

Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources

India's Hunger Paradox: Self-Sufficiency In Production Does Not Necessarily Mean Food Security

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: Issues relating to poverty and hunger

Prepp Mains Booster: Issues relating to poverty and hunger, Government policies and interventions for development in various sectors, and issues arising out of their design and implementation, GS3 - food security

Context:
- Recently, it was revealed that 18% of mothers with children between the age of 6 and 23 months reported that their child did not eat any food in the 24 hours preceding the survey.
- This condition which is referred to as zero food was prevalent in 30% of infants between 6-11 months, 13% of children of 12-17 months, and 8% of children aged 18-23 months.
- SDG 2 aims to achieve zero hunger and ensure access to safe, nutritious, and sufficient food throughout the year by 2030.

What has the data from the NFHS-5 revealed?
- According to the data obtained from the National Family Health Survey-5 which was conducted in 2019-2020, **18% of mothers with children aged 6-23 months reported that their children did not eat food in any form in the 24 hours prior to the survey, a condition referred to as "zero food".**
- The **prevalence of zero food was 30% for children of 6-11 months of age, 13% for those of 12-17 months of age, and 8% among children of 18-23 months.**
- It was concerning that zero food was as high as 13% in the 12-17 month category and that it persisted in the 18-23 months category as going without food for a whole day during what is a crucial period in the child's development raises several concerns related to food insecurity.
- The **WHO has stated that for children of age 6 months, at least 33% of the daily calorie intake is expected from food. The same indicator rises to 61% for 12-month-old children.**
- These nutritional prescriptions are the minimum required from food and include the presumption that the child received "**on-demand breastfeeding**."
- On-demand breastfeeding means that the child is breastfed whenever it needs it throughout the day and night and not just when the mother is able to provide it.
- When a child cannot receive breastmilk as needed, the percentage of food-based calorie intake increases.

Data on Zero Food
- In addition to the **estimated 60 lakh children in India in the 6-23 months age group in the zero food category,** specific food group-based deprivations were also prevalent.
- **Zero-protein**: In excess of 80% of children in the age group had not consumed any protein-rich foods for an entire day.
- **Zero-milk:** Six out of ten children did not consume milk or dairy in any form every day.
- **Zero-grain:** Around 40% of children in this age group did not consume grains in any form i.e. roti, rice, etc for a whole day.

- These conditions existed despite India achieving notable success in the production of various food items and recently becoming the leading producer of milk in the world.
- Therefore, the zero-food conditions indicated that **achieving sufficiency in the production of food does not necessarily equate to attaining food security.**

Are existing policies inefficient?

- Food intake among children should be elevated to a priority instead of being treated as a complementary aspect of policies related to maternal, infant, and young child nutrition.
- Access to affordable and adequate nutritious food is necessary for mothers in order to guarantee healthy breastfeeding.
- The assessment of the scale of nutritional deprivation in young children in India has been based on measures of anthropometric failures such as the percentage of stunted or wasted children in a reference population.
- These anthropometric measures were just proxies suggesting potential overall deficiencies in the child's environment without providing any guidance on the specific nature of the deficiencies.
- The **multifactorial nature of the causes of wasting and stunting** makes it challenging for any single ministry or department to design, monitor and implement policies to tackle undernutrition in children in India.
- Additionally, **intergenerational linkages between parental height and stunting in children and the prevalence of stunting in the reference population used makes it an ineffective metric** for evaluating the effectiveness of existing programmes and developing new interventions.

How can they be improved?

- Surveys such as the NFHS which provide valuable evidence on the nutritional intake of toddlers and infants can be improved.

- The **24-hour recall questions concerned with the consumption of food that are presently asked of younger children below 2 years should be extended to cover children under the age of five.**
- **Questions for adults should also be amended to follow the 24-hour recollection pattern.**
- Assessments using the household-level food insecurity models developed by the FAO can be adopted to measure the level of food insecurity across Indian households.
- The **lack of knowledge on what India eats, i.e. the nutritional nature of the meals** eaten by the country's general population, is a core deficiency in the country's food and dietary consumption data models.
- The increasing prevalence of cardiovascular diseases especially among the middle class is closely linked to diet and nutrition.
- It was essential to implement a national-level initiative that conducts routine dietary and nutritional assessments of the entire population.
- The foundation for any evidence-based policy to end hunger and improve the nutritional security of Indians requires measuring the availability, accessibility, and affordability of nutritious food, especially for vulnerable and disadvantaged groups such as young children.
- **SDG 2 (Zero Hunger)** which aims to end hunger and ensure year-round access to safe, nutritious, and adequate food by 2030 requires considerable efforts by India if targets are to be met.
- **Mission Poshan 2.0,** the country's flagship initiative related to maternal and child nutrition is targeting zero hunger by focusing on food-based initiatives such as the flagship supplementary nutrition programme mandated by the National Food Security Act 2013.
- However, there is a need for appropriate food-based metrics in order to monitor and assess the performance of Mission Poshan 2.0.
- The **Swachh Bharat Mission (SBM)** improved access to toilets among Indian households from 48% to 70% between 2016 and 2021
- The success of the SBM which was assessed by the strategic use of directly trackable metrics and political commitment offers a model that can be emulated by Mission Poshan 2.0.

Conclusion

- Food security has become a global concern as a result of disruptions in global food production and distribution systems caused by Covid-19 and worsened by the Russian invasion of Ukraine.
- Similar to the **high-level White House initiative on hunger, nutrition, and health** as part of the U.S.A.'s prioritizing the ending of hunger, I**ndia should consider a strategic initiative under the Prime Minister's Office to eliminate hunger and ensure access to affordable, and nutritious**

food of sufficient quality and quantity focused on the country's children.

Highly Pathogenic Bird Flu Virus Puts Centre On Alert

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster:
Prepp Mains Booster: Issues relating to development and management of Social Sector/Services relating to Health

Context:
- Recently, the Central Government stated that **India is at 'risk and vulnerable' to the ongoing outbreaks of avian influenza H5N1** worldwide.
- India has one of the largest livestock reserves across the world.
- This year, the world has witnessed one of the worst reported outbreaks of the highly virulent avian influenza H5N1, which has killed millions of birds.
- The virus, which is known to cause severe diseases and death in birds, has also been found in mammalian species and in humans.
- **India has been dealing with influenza since 2006-07** and there is no vaccine for high-pathogenic avian Influenza.
- The World Health Organization (WHO) calls on governments to prepare in case the virus alters and threatens to become a pandemic.

Background
- Although there are different subtypes of avian influenza, H5N1 is a highly pathogenic subtype that causes bird mortality.
- Since 2022, the virus has infected over 100 million birds worldwide, killing over 50 million and culling millions of poultry.
- Unlike earlier outbreaks of highly virulent strains of avian influenza, H5N1 is having a significant impact on wild bird species, including several that were on the edge of extinction.
- While it is difficult to determine how many wild birds have been affected by the virus, a significant impact has been seen in eagles, pelicans, geese, waterfowl, gulls, falcons, and shorebirds, as well as the highest possible impact on poultry seen to date, at least in the United States.

What is H5N1 Avian Influenza?
- Avian influenza, sometimes known as bird flu, is a disease caused by infection with avian influenza type A viruses.
- The virus can infrequently infect mammals from birds, a condition known as spillover, and it can rarely transfer between mammals.
- **H5N1,** an avian influenza subtype, has the potential to infect other animals such as minks, ferrets, seals, domestic cats,

and others by contact with diseased birds, their feces, or infected bird corpses.
- **About Influenza Virus:** There are four kinds of influenza viruses: A, B, C, and D.
  - **Influenza A:** Humans and a variety of animals get infected by influenza A viruses.
  - **Influenza B:** viruses spread among humans and create seasonal epidemics.
  - **Influenza C:** viruses can infect both humans and pigs, infections are usually mild and are rarely reported.
  - **Influenza D:** viruses mostly affect cattle and are not known to infect or cause sickness in humans.

What are the concerns?
- India has a vast reserve of cattle, wild population, and domestic poultry, accounting for over 18% of global stock.
- Around the world, the virus is being detected among wild birds and other species, increasing the likelihood of it mutating and becoming harmful.
- H5N1 was detected by the ICAR-National Institute of High Security Animal Disease, Bhopal from the samples received from Government Poultry Farm at Bokaro, Jharkhand on February 17, 2023.
- India has now initiated the Animal Pandemic Preparedness programme to tackle such potential pandemics.
- Bird flu has led to the death and slaughter of 316 million poultry worldwide between 2005 and 2021. WHO has called on governments to prepare in case the virus alters and threatens to become a pandemic.
- According to the World Health Organization, H5N1 infection in humans can cause serious sickness and has a high mortality rate.

How has it affected other birds?
- At least 20 California condors, a species on the verge of extinction since the 1980s, have died as a result of H5N1 avian influenza. With an estimated 300 condors living in the wild, this would account for around 7% of the species.
- Since January 2022, H5N1 has killed a substantial number of bald eagles and Caspian terns in the United States, as well as thousands of cranes in Israel.
- H5N1 infected a colony of endangered African penguins in South Africa last year, killing at least 30 penguins.
- The virus's uncontrolled spread might thus prove disastrous to the world's already fragile populations of endangered birds, leading to the extinction of numerous species.

Impact on wild bird population
- The impact of H5N1 on wild bird populations has varied based on a number of factors, including the degree of exposure, geographic location, and migratory habits of the afflicted species.
- High mortality in wild birds owing to the virus might have substantial ecological repercussions, including predator vulnerability and changes in species composition in

impacted habitats, and therefore a potential influence on biodiversity that is not restricted to avian species.

- It has sparked worries about the virus's proliferation among severely endangered bird groups.

How does it spread to animals?

- The extremely infectious H5N1 virus can occasionally spread from birds to animals through direct or indirect contact with infected birds or their droppings.
- Several reports from various countries have indicated that H5N1 has spread to mammals during the current outbreak, infecting species such as sea lions, minks, foxes, wild bears, and skunks, in addition to domestic animals such as dogs and cats.
- H5N1 caused the deaths of about 3,000 sea lions in Peru alone in 2023. The only recorded occurrences of the virus spreading between animals were in minks bred in tight confinement on a farm in Spain.
- Transmission of H5N1 from birds to mammals is uncommon, but when it does occur, it can be concerning since the virus may accumulate mutations and gain the ability to cause human outbreaks.

Mortality rate in humans

- H5N1 has a high mortality rate in humans of over 60%, and it is typically transmitted to people by direct contact with sick birds or animals, either through handling infected poultry or exposure to polluted environments.
- A few isolated cases of human H5N1 infection have also been documented in Ecuador, Cambodia, and, most recently, Chile in recent months.
- Given the ongoing threat of an influenza pandemic, monitoring the spread in mammalian populations is critical in areas where humans and animals coexist.
- However, since the virus does not yet transmit efficiently among humans, the World Health Organization (WHO) has determined that the risk of H5N1 to humans is low.

Preventive Measures

- As the current H5N1 outbreak continues unabated, with devastating effects on avian populations worldwide and significant ecological and economic consequences, the time has never been better to begin efforts for preparedness toward developing better, more efficient vaccines for avians and humans, as well as genomics surveillance to map the virus's continued evolution.
- Enhanced biosecurity measures are also required to safeguard both animal and human health.
- To reduce public health risk, excellent surveillance in both animal and human populations, careful analysis of every human infection, and risk-based pandemic preparedness are required.

Diagnostic Imaging Of The Rajasthan Right To Health Act

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Right to Health
Prepp Mains Booster: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources; Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Context:

- Recently, the Rajasthan Government agreed to some exclusions in the Right to Health Bill that became an act in April 2023, following protests by doctors who termed the Act draconian.
- The renewed composition of the State and district health authorities and the restrictions on the administrative organs in the amended bill have raised concerns about protecting public health interests.

What is the Rajasthan Government's Right to Health Act?

- The **Right to Health Bill** of the Rajasthan Government which became an Act in April 2022 is aimed at ensuring the right to health and access to healthcare for the citizens of the state.
- As per the Act, the **State is obligated to formulate a public health model, make adequate provisions in the budget, and provide health services in accordance with considerations such as distance, geographical area, and population density**.
- The Bill provides rights to patients and healthcare providers and places the obligation on the government to protect these legal rights.
- It **aims at achieving a progressive reduction of the out-of-pocket expenditure associated with healthcare** in the state. It includes entitlements such as free checkups, drugs, diagnostics, affordable surgeries and emergency transport services.
- The Government was also mandated to lay down standards for quality and safety and to ensure the adequate supply of safe drinking water, nutrition, and sanitation.
- The State also had to implement measures to prevent, control, and treat epidemics and other public health emergencies.
- The Act directs the establishment of **Health authorities at the State and district levels** which are responsible for formulating, implementing, monitoring, and developing mechanisms for quality healthcare management.
- The bill also included provisions for grievance redressal including an online web portal and helpline center for filing

complaints against the denial of services and the infringement of rights of patients.

Provisions related to the Right to Health
- Although the **Indian Constitution does not explicitly mention the Right to Health, it has been theoretically derived from the right to life and liberty under Article 21.**
- **Article 38 which is related to the promotion of public welfare** and **Article 47 which directs the government to meet the nutritional and health requirements of the population.**
- In the **Paschim Banga Khet Mazdoor Samity case**, the Supreme Court ruled that it is the responsibility of the government to provide medical aid in the interest of promoting public health.
- In **Parmanand Katara Vs Union Of India**, the Supreme Court ruled that every doctor at a government hospital or otherwise was professionally obligated to extend his services for protecting life.
- As per a 2013 study, more than half of the world's countries have guaranteed the right to health to their citizens as part of its Constitution.

What are the Protests around the Act?
- The Bill passed by the Assembly has been opposed by doctors, who termed it draconian while it has been supported by public health activists.
- Private healthcare providers have protested over the ambiguity related to who will pay for the mandatory and free treatment.
- Doctors' associations have also accused the bill of shifting the government's responsibility for public healthcare onto the private sector and increasing the load on the sector.
- Doctors have also described the bill as futile and over-regulatory and not likely to improve equitable access to healthcare.
- The State Government responded to the protests and agreed on certain exclusions.
- The initial version of the Bill was sent to a select committee for review in 2022 and the amended bill was passed in the Assembly in March 2023 following the protests across the state.

What are the pros and cons of the amended bill?
- The amended bill was found to be a highly moderated version of the previous bill which had been altered to suit the interests of the medical community.

Positives
- **Definitions of specific terms such as accidental emergency, emergency care, and first aid were added** to the bill following the recommendations of the select committee.
- The term **'designated health care centers' and a clause prescribing reimbursement for unpaid emergency medical care were also introduced** as part of the amendments.
- Although these amendments are praiseworthy, most of the remaining changes made were not as effective in promoting the interest of public health.

Negatives
- The composition of the State and district health authorities was renewed.
- The **State Health Authority which included three representatives from ayurveda, homeopathy, and unani as ex-officio members in the initial bill was amended to include only one member from the alternative streams, with the two remaining members representing medical education.**
- The amended bill also replaced public health or hospital management experts with representatives of the Indian Medical Association as nominated members.
- Consequently, the Authorities had lowered representation from the public health fraternity and the members of the community at whom the bill is targeted.
- The Bill has also **limited the powers of the Administrative organs and overhauled the grievance redressal mechanism proposed in the original Bill.**
- The grievance redressal mechanism which was to be handled within 24 hours by web portals, helplines, and concerned officials will now be replaced by the healthcare institution concerned within three days, introducing conflicts of interest.
- The new provision would also increase the administrative burden on the hospitals and could lead to inefficient redressal of grievances and informal settlement of disputes.
- Health legislation is not just concerned with curative medical care but also health promotion, disease prevention, and other major determinants of health such as nutrition which have a greater role in health than medical care.
- The present iteration of the Right to Health Act is lacking in public health representation and is not set to achieve its goals or serve as a replicable model for the other states or the country as a whole.
- Under a Memorandum of Understanding, the **State has assured doctors' associations that private multispeciality**

hospitals with less than 50 beds and those that have not availed of any concessions or subsidized land and buildings from the government will be exempt from the law.

- As a result, small and medium-sized hospitals which are the most prevalent in the healthcare landscape of the state, especially in rural areas have been excluded from the ambit of the Act.
- In comparison, the U.S. legislation, **the Emergency Medical Treatment and Labor Act (EMTALA)** aimed at ensuring public access to emergency care covers 98% of hospitals.

Assessment

- Demands for the in-toto repeal of the bill over objections such as the ambiguous definition of terms such as emergency are frivolous as medical-legal definitions are generally ambiguous and imprecise.
- All parties in such medico-legal matters are expected to cooperate in order to attain the best possible outcomes instead of demanding the repeal of the bill which could have large-sale implications for public health and emergency care.
- The EMTALA legislation has shown that some ambiguities cannot be eliminated and that it is better to use risk-benefit and reasonable confidence principles to navigate the healthcare landscape.

Way Forward

- The state should ensure that similar legislation should in the future be drafted meticulously in order to avoid opposition from affected parties.
- The Government has to ensure that it is not influenced by organized medical interests alone so that true health legislation can be enacted.
- Most related protests are based on the argument that the medical profession should be as **laissez-faire** as possible which is incompatible with the principles of universal and affordable health care.
- Both governments and the medical community should sensitize themselves to the broader social dimensions of health and healthcare legislation.
- Governments must also realize that **enacting such legislation without sufficient financial planning can be ineffective as it is the state's responsibility to provide health care and not that of healthcare providers at the cost of their livelihood.**

Even Limited Arsenic Exposure Mars Cognitive Function

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Health

Prepp Mains Booster: Issues relating to development and management of Social Sector/Services relating to Health; Conservation, Environmental pollution and degradation

Context:

- Recently, a peer-reviewed study reveals that **even modest levels of arsenic ingestion may damage cognitive performance in children, adolescents, and young adults.**
  - It is widely known that **swallowing high amounts of arsenic from contaminated groundwater in India has been related to a variety of diseases.**
- The recent study, which is part of a larger investigation into how a variety of environmental and biological factors affect neurological and cognitive development in young people, also discovered that **those exposed to arsenic had less grey matter** (brain tissue vital to cognitive functions) and weaker connections within key regions of the brain that allow concentration, switching between tasks, and temporary storage of information.

About Arsenic

- Arsenic is an odorless and tasteless metalloid that is extensively dispersed in the earth's crust.
- It is naturally present in large concentrations in the earth's crust and groundwater in a number of nations. It is very poisonous in its inorganic form.
- It is a hazardous element that poses a risk to human health. It can exist in both organic and inorganic forms.
  - **Organic arsenic compounds** (such as those found in seafood) are less damaging to health.
  - **Inorganic arsenic compounds** (such as those present in water) are extremely poisonous.

How is Arsenic produced?

- **Soil and groundwater:** Arsenic enters the soil and groundwater by weathering rocks and minerals, which is followed by leaching and discharge. Anthropogenic sources may also release it into soil and groundwater.
- **High-temperature activities** including coal-fired power plants, burning vegetation, and volcanism produce arsenic into the atmosphere.
- Concentrations can be greatly enhanced in water, especially groundwater, where there are sulfide mineral

deposits and sedimentary deposits derived from volcanic rocks.
- Arsenic is also released into the atmosphere via natural low-temperature biomethylation and reduction to arsines.
- **In India,** the states of West Bengal, Jharkhand, Bihar, Uttar Pradesh, Assam, Manipur and Chhattisgarh are reported to be most affected by arsenic contamination of groundwater above the permissible level.

Findings of the Report
- **Silent Pandemic:** Chronic arsenic poisoning may be causing a 'silent pandemic,' impacting substantial segments of the world population.
- **Poor affected the most:** Previous research has revealed that arsenic exposure is particularly detrimental to the poor. This study, too, confirmed that arsenic exposure causes higher cognitive damage in the economically and nutritionally disadvantaged.
- **Food intake:** Arsenic exposure was highly connected to food intake, demonstrating that background inorganic and organic arsenic in foods is a substantial source to arsenic exposure in many parts of India outside those locations where arsenic exposure from groundwater is naturally high. West Bengal, Jharkhand, Bihar, Uttar Pradesh, Assam, and Manipur have long been recognised as areas having high arsenic levels in the background.
- **Arsenic in rice:** Arsenic consumption from food was most typically connected with rice intake, which is more widely consumed in south India (Rishi Valley and Bangalore) and has the highest mean arsenic levels.
- **Mapping brains:** The link between arsenic exposure and brain function emerged from the C-Veda data. It is more likely to thoroughly investigate the degree to which arsenic affects the brain.

Arsenic and Human Health
- When arsenic is present at high concentrations in drinking water, it has been found to cause extensive health impacts in people.
- Long-term exposure to arsenic in drinking water has been linked to an increased risk of skin, lung, bladder, and kidney cancer, as well as other skin alterations such as hyperkeratosis and pigmentation changes.
- Soluble inorganic arsenic is highly hazardous, causing gastrointestinal symptoms, changes in cardiovascular and nervous system functioning, and finally death.
- Surviving patients may experience bone marrow depression, haemolysis, hepatomegaly, melanosis, polyneuropathy, and encephalopathy.
- In a few studies, drinking water with less than 50 μg of arsenic per litre was linked to an increased risk of lung and bladder cancer, as well as arsenic-related skin blemishes.

What are the efforts taken?

- Since the 1990s, **both the federal and state governments in Bihar and West Bengal have worked to reduce arsenic pollution.**
  - A common strategy is to encourage piped water access rather than groundwater extraction, install arsenic removal plants, and if groundwater extraction is unavoidable, encourage extraction from aquifers (water channels below the ground) deeper than 100 m rather than shallower aquifers, which generally contain higher levels of arsenic.
- **C-Veda (Consortium on Vulnerability to Externalizing Disorders and Addictions)** is a multi-university research collaboration between India and the United Kingdom. It seeks to assess the impact of risk - both biological and environmental on cognitive development and to compare these effects across persons in developing (India) and developed (UK) countries.
  - This includes mapping the brains of research participants and measuring and comparing neurological development.
- **2030 Agenda for Sustainable Development:** The indicator of "safely managed drinking water services" in the 2030 Agenda for Sustainable Development calls for tracking the population accessing drinking water that is free of faecal pollution and prioritized chemical contaminants such as arsenic.
- **Jal Jeevan Mission:** By 2024, the Jal Jeevan Mission aims to deliver clean and sufficient drinking water to all rural Indian homes via individual household tap connections.

After Sugar, Time To Watch Out For How Much Salt Is Consumed

Priority: Low
Primary Source: The Hindu
Prepp Prelims Booster: Health
Prepp Mains Booster: Issues relating to the development and management of Social Sector/Services relating to Health; the role of NGOs

Context:
- Recently, the **Indian Council for Medical Research** tweeted about the ways to **reduce salt intake** by avoiding the addition of salt while cooking rice or preparing the dough, skipping pickles and table salt, and going in for salt substitutes. It rightly pointed out that children, younger than 12 years, require only 3 grams of salt per day.
- Earlier, the **World Health Organisation** had cautioned a couple of months ago that the world is off track to achieve its global target of **reducing salt intake by 30% by 2025.**

Why should India cut down on its salt intake?

- Excess **sodium is the main culprit in an unhealthy diet** that is the main cause of **Non-Communicable Diseases (NCDs).**
- The amount of dietary salt (sodium chloride) consumed is an important **determinant of blood pressure levels** and hypertension and overall cardiovascular risk.
- Salt reduction in the diet is the **most cost-effective measure** to control non communicable diseases.
- A salt intake of less than 5 grams (approximately 2g sodium) per person per day is recommended by WHO for the prevention of cardiovascular diseases, the leading cause of death globally.
- **Decreasing dietary salt intake** from the current global levels of 9–12 grams per day to the recommended level of less than 5 grams per day would have a major **impact on blood pressure and cardiovascular disease,** averting up to 2.5 million deaths due to heart attacks and stroke worldwide each year.

Concerns

- **No national Policy:** According to a scorecard, **established by WHO** India does not have **a national policy**.
- An average Indian's sodium consumption is **more than double** the physiological need and dramatically exceeds the **World Health Organization'**s recommended daily intake.
- **Lack of Awareness:** Only persons who have **hypertension or kidney disease** are advised by their personal physicians to reduce salt in their diet.
- The **general population remains largely unaware** of the risks associated with hidden salt in packaged and processed foods and moreover, salt labeling is not currently mandatory in India.
- **Prevalence:** Data from the **National Family Health Survey-5** reveals that hypertension is more prevalent among men aged 15 and above compared to women in the same age group.
- A recent Swedish study found a link between salt consumption and Atherosclerosis, even in the absence of hypertension. **Atherosclerosis** is a disease that blocks the blood vessels.

- Each additional gram of sodium consumption was linked to a **9% increase in the occurrence of plaques in the carotid arteries,** which provide blood to the brain, and a 17% increase in coronary artery plaques.

Status of Global Salt Consumption

- According to WHO's Global report on sodium intake reduction **only 5% of the WHO member states have mandatory** and comprehensive sodium-reducing policies.
- 73% of the WHO member states lack the full range implementation of the policies.
- Implementing highly cost-effective sodium-reducing policies could save an estimated seven million lives globally by 2030.
- The United Kingdom has been a global leader in reducing population salt use. The salt content of bread has been gradually reduced by 30% over the past ten years. As a result, hundreds of strokes and cardiovascular events have been avoided.
- According to a Cochrane review, reducing salt in the diet in diabetic patients is associated with slower progression of kidney disease and fewer drugs required to control blood pressure.

Suggestions

Following measures suggested by WHO

- reformulation of food to contain less salt;
- controlled procurement of high-sodium food in public institutions like schools, workplaces, and hospitals;
- labeled promotion of packed foods with low sodium choices;
- achieving behavioral changes in the population through campaigning in media.

NGOs

- NGOs have been playing an important role in raising awareness among the general public.
- Recently, **salt awareness week** was celebrated between May 15 to May 21. The pioneering organization from the **U.K., WASH (World Action on Salt and Health)** has been spearheading campaigns all over the world.
- **Sapiens Health Foundation**, an NGO from Chennai is planning to form a low-salt group and involve more than 100 physicians and food manufacturers to conduct research and bring down the sodium content of packed foods.
- It has written to more than 300 food manufacturers in the country to use modern **technology for prolonging the shelf** life rather than use sodium. Similarly, **low-salt substitutes** should be offered in various snacks.
- The foundation has also written to the Central Government to **make salt labeling mandatory** and copy the signal labeling of the U.K. where red color indicates unhealthy high salt content.

Way forward

- During the COVID-19 pandemic, notable studies from China and Germany pointed out the association **between high salt intake and decreased immunity** in the body.
- The goal should be to enhance the quality of life by preventing strokes and heart attacks, rather than solely focusing on prolonging longevity
- Therefore, a multi-pronged approach, engaging consumers, industry, and the government, is crucial. Collaboration between State and Union governments is essential to combat hypertension, often caused by excessive sodium intake.

> FSSAI initiated a nation-wide **social media campaign** -**"Aaj Se Thoda Kam"**The objective of the campaign is to bring about dietary modifications to reduce the diet-related non-communicable diseases like diabetes, hypertension, heart diseases, etc. It encourages the consumers to gradually decrease the **consumption of salt, sugar and fat; and manufacturers to reformulate their products.**

Vaping Ban Violations: Centre Issues Public Notice For Stricter Implementation Of Act

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: E-Cigarettes

Prepp Mains Booster: Issues relating to the development and management of Social Sector/Services relating to Health; Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:
- Recently, the Union Health Ministry has issued a public notice for stricter implementation of the **Prohibition of Electronic Cigarettes Act**, expressing concern that Electronic Cigarettes are still available online and at local vendors.
- The Prohibition of Electronic Cigarettes (Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement) Act came into force in 2019.
- It prohibits manufacture, sale and advertisements of electronic cigarettes as e-cigarettes easily available online and at tobacco shops despite a ban.

Why does the center issue public notice?
- **Weaker enforcement:** The ban was introduced to protect our younger generation from a new form of toxic addiction. However, its enforcement has been weak, resulting in the market being flooded with cheap and unbranded Chinese-made e-cigarettes.
- **Availability:** Despite heavy penalties and imprisonment, E-cigarette marketers have illicitly managed to achieve a foothold in the market and are widely available across a range of sources, including tobacco vendors, general stores, and online providers.
- **Schools:** The availability of e-cigarettes near educational institutions have also been reported, which is resulting in easy access by young children.
- **For Ensure effective compliance:** The ministry has directed all producers, manufacturers, importers, exporters, distributors, advertisers, transporters including couriers, social media websites, online shopping websites, shopkeepers/retailers etc. n**ot to directly or indirectly produce or manufacture or import or export** or transport or sell or distribute or store e-cigarettes, whether as a complete product or any part thereof.
- **Prohibition on advertisement:** In the notice issued recently, it has also asked them **not to advertise electronic** cigarettes or take part in an advertisement that directly or indirectly promotes the use of electronic cigarettes.

What are e-cigarettes and how do they work?
- Electronic nicotine delivery systems (ENDS) or non-combustible tobacco products are known by many names — vapes, e-hookahs, electronic cigarettes and e-pipes.
- E-cigarettes may be manufactured to look like traditional cigarettes and are **marketed as tobacco-free nicotine delivery devices.**

Working
- While tobacco smoking produces harmful byproducts such as tar, carbon monoxide, and numerous other chemicals, e-cigarettes **primarily deliver nicotine without the combustion process.**
- An e-cigarette is a **battery-operated device**, produces aerosol by heating a solution containing nicotine among other things.
  - Vaping refers to the use of an electronic device that heats a liquid turning it into an aerosol (vapor) that the user inhales.
- The device contains **nicotine and flavors in the form of liquid** which is primarily composed of solvents such as **glycerol and/or propylene glycol.**
- The aerosol containing a suspension of fine particles and gases simulates cigarette smoke.
- Following a puff, the aerosol is delivered to the user's mouth and lungs and the rest is exhaled.

What are the effects?
- E-cigarettes like traditional cigarettes deliver **ultrafine particles and nicotine deep into the lungs**, which is then absorbed by the blood.
- **Increased heart attack risk:** According to a 2018 study the use of e-cigarette daily was associated with **a 79% increase in heart attack risk** after other variables were taken into account.
- **Brain Development:** According to the 2016 report by the U.S. Surgeon General, "e-cigarette use among youths and young adults is a **public health concern** and exposure to

nicotine during adolescence can cause addiction and can harm the developing **adolescent brain.**

- The regions of the brain that regulate attention, learning, emotion, and impulse control are harmed by nicotine. Synapses, or connections between brain cells, are also altered by nicotine. Given that younger brains develop more synapses, this is concerning.
- **Addictive nature:** The addictive nature of e-cigarettes, coupled with **appealing flavors,** has contributed to their popularity among the younger generation.
- **Flavors such as diacetyl** used in e-cigarettes are linked to serious **lung diseases.**
- **Carcinogens:** According to a white paper on e-cigarettes by the **Indian Council of Medical Research (ICMR),** nicotine solvents can produce different levels of possible **carcinogens** such acetaldehyde, formaldehyde, and acetone depending on the battery output voltage utilised.
- In addition, "toxic chemicals and metals that can cause several adverse health effects, including cancers and diseases of the heart, lungs, and brain" are **present in the liquid-vapourizing solutions.**
- According to the ICMR research, the "adverse health impact will outweigh any presumed benefit to individual cigarette smokers" at the population level.
- According to the researchers from the **Australian National University Centre for Epidemiology and Population Health**, **vaping,** causes poisoning, injuries, burns and immediate toxicity through inhalation, including seizures, as well as addiction.
- **Presence of heavy metals:** E-cigarettes also contain volatile organic compounds, heavy metals, such as nickel, tin and lead.
- **Effect on Animals:** In animals, it was discovered that exposure to aerosols increased "secretion of **inflammatory markers**, induced airway **hyper-reactivity**, and caused lung tissue degradation in chronic exposure.
- However, the public health organisation in England, Public Health England, reaffirmed its position in 2018 that vaping is at least 95% less dangerous than smoking.

Conclusion

- The decision of issuing public notice is to prohibit the usage of e-cigarettes and protect the population, especially the youth and children, from the risk of addiction through E-cigarettes. Enforcement of the Act will complement the government's efforts for tobacco control and will help in the reduction of tobacco use and reduction in associated economic and disease burden.

Prohibition of Electronic Cigarettes Act 2019

- The Prohibition of Electronic Cigarettes (Production, Manufacture, Import, Export, Transport, Sale, Distribution, Storage and Advertisement) Act came **into force in 2019.**
- It prohibits the manufacture, sale, and advertisement of electronic cigarettes.
- According to the provisions of the Act, "**authorized officers**" have been made responsible for the implementation of the order in accordance with the **Code of Criminal Procedure, 1973.**
- Production, manufacture, import, export, transport, sale (including online sale), distribution, storage, and advertisement of electronic cigarettes is cognizable and punishable as per the statutory provisions of the Ac**t**

Government Programme For Non-Communicable Diseases Renamed

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Non-communicable Diseases
Prepp Mains Booster: Issues relating to the development and management of Social Sector/Services relating to Health; Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:

- Recently, the government renamed the existing **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)**

programme to the **National Programme for Prevention & Control of Non-Communicable Diseases (NP-NCD)** amid widening coverage and expansion.

What are Non-communicable diseases (NCDs)?

- Noncommunicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of **a combination of genetic, physiological, environmental and behavioural factors.**
- The main types of NCD are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.
- NCDs disproportionately affect people in low- and middle-income countries, where more than three-quarters of global NCD deaths (31.4 million) occur.

Status of Non-communicable Diseases (NCDs) in India

- According to a **study 'India: Health of the Nation's States - The India State-Level Disease Burden Initiative in 2017'** by Indian Council of Medical Research (ICMR).
- It was estimated that the **proportion of deaths due to NCDs** in India has **increased** from 37.9% in 1990 to 61.8% in 2016.
- The four major NCDs are
  o cardiovascular diseases (CVDs),
  o cancers,
  o chronic respiratory diseases (CRDs) and
  o diabetes which shares four behavioural risk factors – unhealthy diet, lack of physical activity, and use of tobacco and alcohol.
- Under NPCDCS, 677 NCD district-level clinics, 187 District Cardiac Care Units, 266 District Day Care Centres and 5,392 NCD Community Health Centre-level clinics have been set up.

Impact of NCDs

- **Poverty:** The rapid rise in NCDs is predicted to impede poverty reduction initiatives in low-income countries, particularly by increasing household expenditure associated with health care.
- **Lower life expectancy:** Vulnerable and socially disadvantaged people get sicker and die sooner than people of higher social positions, especially because they are at greater risk of being exposed to harmful products, such as tobacco, or unhealthy dietary practices, and have limited access to health services.
- **Higher cost of treatment:** The exorbitant costs of NCDs, including treatment, which is often lengthy and expensive, combined with the loss of income, force millions of people into poverty annually and stifle development.
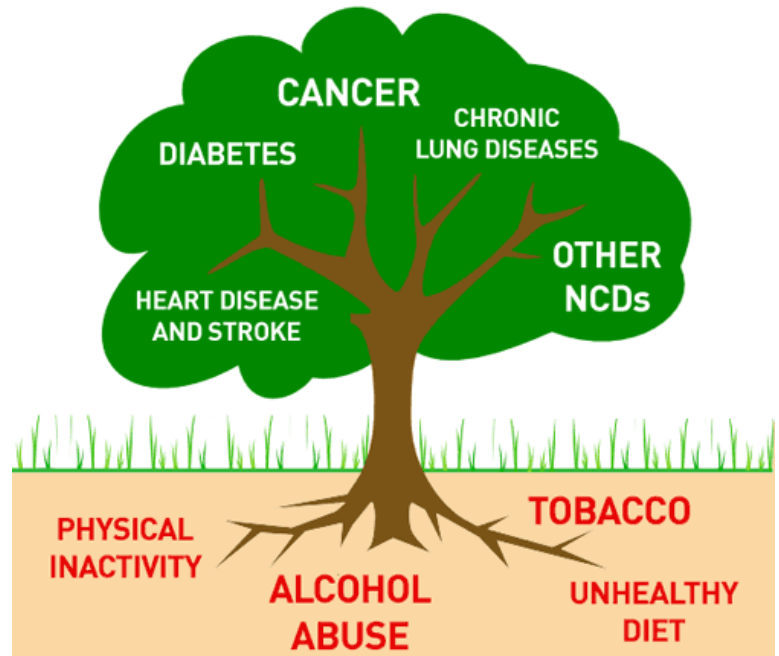
Prevention and Control

- **Focus on risk factors:** Many NCDs can be prevented by reducing common risk factors such as tobacco use, harmful alcohol use, physical inactivity and eating unhealthy diets.
- **Awareness:** Public awareness and understanding of the burden of the most common NCDs, related risk factors, and mental or neurological conditions.
- **Access to Healthcare:** Management of NCDs includes detecting, screening and treating these diseases, and providing access to palliative care for people in need.

Way forward

- The 2030 Agenda for **Sustainable Development adopted** by the United Nations in **2015 recognizes noncommunicable diseases (NCDs)** as a major public health challenge. **Sustainable Development Goal (SDG) 3** includes target 3.4 to reduce premature NCD mortality by one-third by 2030.
- In order to lessen the impact of NCDs on individuals and society, a **comprehensive approach** is needed requiring all sectors, including health, finance, transport, education, agriculture, planning and others, to collaborate to reduce the risks associated with NCDs, and to promote interventions to prevent and control them.

Initiatives by the Government for NCDs
- The **National Programme for Prevention and Control of Cardiovascular Diseases, Diabetes, Cancer & Stroke (NPCDCS)** was launched in 2010 with focus on strengthening infrastructure, human resource development, health promotion, early diagnosis, management and referral.NPCDCS is being implemented under the National Health Mission (NHM) across the country.
- National Programme for Control of Blindness & Visual Impairment (NPCB & VI).
- National Programme for Health Care for Elderly (NPHCE).

- National Programme for Prevention and Control of Deafness (NPPCD).
- National Programme for Prevention and Control of Oral Health (NOHP).
- National Mental Health Programme (NMHP).
- National Haemoglobinothathies Control Programme.
- National Programme for Palliative Care (NPPC).
- National Iodine Deficiency Disease Control Programme (NIDDCP).
- National Tobacco Control Programme (NTCP).
- National Programme for Prevention and Control of Fluorosis (NPPCF).
- National Programme for Prevention and Management of Burn Injury (NPPMBI).
- Pradhan Mantri National Dialysis Programme.
- National Programme for Control Treatment of Occupational Diseases
- National Organ and tissue transplant Programme.
- In response to the "**WHO Global Action Plan for the Prevention and Control of NCDs 2013-20 20",** India is the first country to **adopt the National Action Plan with specific national targets and indicators** aimed at reducing the number of global premature deaths from NCDs by 25% by 2025.
- India's **National Monitoring Framework for Prevention and Control of NCDs** has committed to a 50% relative reduction in household use of solid fuel and a 30% relative reduction in the prevalence of current tobacco use by 2025.

International Relations

India, Russia Said To Suspend Talks To Settle Trade In Rupees

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: India-Russia
Prepp Mains Booster: Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests.

Context:
- Recently, according to a report by Reuters, India and Russia have suspended efforts to settle bilateral trade in rupees after months of negotiations failed to convince Moscow to keep rupees in its coffers.

Reasons for Suspension talks to settle Trade In Rupees
- According to the report Russia was not comfortable holding rupees and wanted to be paid in Chinese yuan or other currencies.
- **Trade Gap:** Russia feels that rupee accumulation is 'not desirable' and it would end up with an annual rupee surplus of over $40 billion if such a mechanism is worked out.

- **Convertibility of rupee:** The rupee is not fully convertible, and India's share of worldwide exports of goods is only around 2%. These factors lower the need for other nations to hold the currency.

Impact
- **Indian firms:** The result would be a **significant setback for Indian companies** that buy cheap coal and oil from Russia and were hopi
- ng for a long-term rupee payment mechanism to help lower currency conversion costs.
- **Rely on other currencies:** The countries have to rely on other currencies for trade settlement which might be subject to fluctuations and have associated conversion costs which inturn increase the cost of doing business.
- **Limitation on trade opportunities:** The currency settlement can act as an inhibitor on the expansion of trade and other economic opportunities between both countries.
- The suspension could hamper the deepening of strategic ties beyond defense and energy.The settlement in rupees could have provided opportunities for Indian Banks and financial institutions to expand their reach into russia.

How present transactions are made with Russia?
- India's imports from Russia have increased significantly since Russia's invasion of Ukraine in February 2020.
- The trade has increased from $10.6 billion in previous year to $51.3 billion until April 5.
- The surge in imports was largely due **to discounted oil**. However, Indian exports in the same period decreased slightly to $3.43 billion from $3.61 billion in the previous year.
- **Use of other currencies:** Despite sanctions and payment issues, trade with Russia has continued, with some payments being made in dirham and other currencies, but the majority still being settled in dollars.
- Indian traders are also using **third-party countries to settle some trade payments** with Russia, as there is no ban on transacting with other countries over SWIFT.
- o The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a secure messaging system that enables quick cross-border payments and serves as the primary mechanism of funding international trade.
- These third-party countries then **offset the payments for their own trade with Russia.**

Way forward
- India and Russia need to diversify their trade beyond energy, defense and agricultural commodities.
- India and Russia can collaborate with each other in various fields of Space, machinery, and Services in order to decrease the trade Gap. India needs to work towards the internationalization of currency which would help in expanding the usage of the rupee in cross-border transactions.

EU Foreign Minister Says Europe Should Stop Entry Of Indian Products Made From Russian Oil

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: International relations

Prepp Mains Booster: Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests.

Context:
- Recently, European Union's (EU) Foreign Minister, Josep Borrell, said that Europe should not permit the entry of refined petroleum products from India that are made from Russian oil.

What did the EU's Foreign Minister say?
- Mr. Borrell said it was "normal" for India to buy **cheap Russian oil** following the G-7 price cap of $60 per barrel, however, it was **not acceptable for that oil to be routed to Europe via refined products.**
- However, if India was acting as a **"centre" where Russian oil** is being refined and products being sold to the EU, then the EU has to act.
- According to Borrell, any mechanism to prevent the flow of Russian oil would need to be implemented by the national authorities, suggesting that the **EU could target buyers of Indian refined fuels** which it believes are derived from Russian crude.
- **According to data from Kpler,** a leading provider of intelligence solutions for commodity markets, Indian **refined oil exports to the EU have increased** after the EU banned Russian oil product imports from Feb. 5 this year.

- Indian refiners, which rarely bought Russian oil previously due to high transport costs, imported 9,70,000-9,81,000 bpd of it in 2022/23, accounting for more than a fifth of overall imports owing to discounted rates.

India's Argument
- The Government dismissed the charge that India was circumventing sanctions, stating that the **government had no knowledge** of such sales as they are being done by private entities and oil refineries.
- **In line with EU's Regulation:** India advised Borrell to refer to EU Council regulations, **specifically Regulation 833/2014**, which recognizes that Russian crude undergoes substantial transformation in a third country and is no longer treated as Russian.
- **Impossible to predict the source:** The government also said that it is not possible to tell whether these products being sold to Europe are being traded on the high seas, or even coming from India.
- Recently, the Petroleum and Natural Gas Ministry denied an allegation by a Finland-based Centre for Research on Energy and Clean Air (CREA), that alleged that India led **five countries (** India, China, Turkey, the UAE and Singapore**)** that acted as "laundromats" to buy Russian oil and sell refined products to European countries.
  - "laundromat countries" are those countries that are used to circumvent sanctions on Russian oil. These countries buy Russian oil at a discounted price and then sell it to other countries, often at a higher price.
- The Ministry said that as a **sovereign country**, India was free to import or export goods and commodities.

Significance of rise in India's petroleum product exports to the EU
- **Preventing extreme price rise:** Suppliers like India are helping in balancing demand supply by preventing extreme price shocks.
- India is playing an increasingly prominent role in the **global crude oil and refined products supply map** by bridging the gap by buying Russian oil on one hand and increasing the supply of refined products to the EU on the other.
- **Discounted Prices:** Western sanctions helped Indian refiners, particularly export-oriented private sector players Reliance Industries and Nayara Energy, as it allows Indian refiners to purchase Russian oil at a discount while earning robust margins on product supplies to Europe.
- India's refining capacity is higher than its domestic demand, making the country a net exporter of petroleum products.

India's Fuel Exports to the West Are Growing
South Asian nation helping to plug supply gap in Europe, the US

Europe ■ US

500 kilobarrels/day

Jan 2021 — Jan 2023

Source: Kpler

Bloomberg
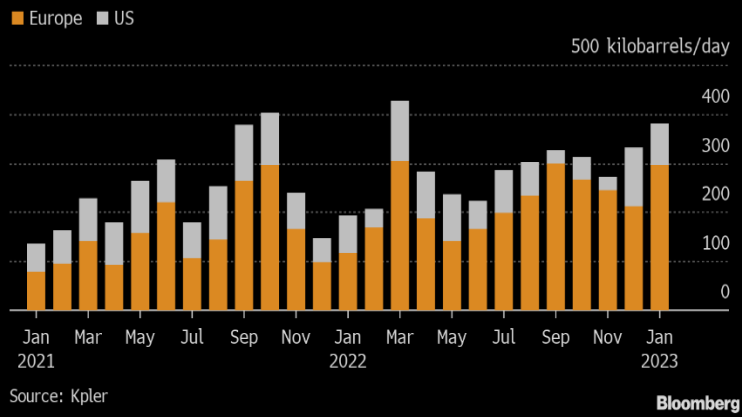
Way forward

- The EU and India should tackle thorny issues through dialogue and boost trade ties, the EU is the second-largest destination for Indian exports (14.9% of the total) after the USA (18.1%), and last year the two sides restarted talks for a free trade agreement

Outlawing India's Tech Tariffs

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: WTO

Prepp Mains Booster: International institutions, agencies, and fora- their structure, mandate; Indian Economy, Effects of liberalization on the economy

Context:

- Recently, three dispute settlement panels at the WTO have found that India's tariffs on certain Information and Communication technology products such as mobile phones are inconsistent with its WTO obligations.
- The panels hearing petitions brought by the EU, Japan, and Taiwan found that India has violated Article II of GATT because its tariffs breach its Goods Schedule.
- India is likely to appeal the decision but the Appellate body has ceased to exist because of the United States blocking the appointment of members.

What has the WTO ruled on India's tariffs on ICT products?

- Three dispute settlement panels of the **WTO** have found that India's tariffs on some Information and Communication Technology (ICT) products such as mobile phones are inconsistent with India's WTO obligations.
- The **panels heard complaints filed by the European Union, Japan, and Taiwan and held that India has violated Article II of the General Agreement on Trade and Tariffs or GATT because India's tariffs breach its Goods Schedule.**

- One of the primary objectives of the WTO is to boost transparency and predictability in the multilateral trading order.
- Member countries are legally obligated to not impose tariff rates above the bound or maximum tariff rates committed to in their Goods Schedule.
- The Goods Schedules are based on the **World Customs Organization's classification system, known as the Harmonized System of Nomenclature (HSN)** which catalogs traded products with specific names and numbers.
- The WTO states that the **Goods Schedules, also known as WTO Schedules of Concessions**, are legal documents that specify the treatment that each member state is required to give to the trade in products of other WTO members.
- They are one of the primary instruments used by the WTO to maintain transparency, security, and predictability for world trade.
- The HSN is regularly updated to include new products developed through technological innovations through a process known as **transposition**.

What are the arguments before the panels?

- India argued that its binding tariff commitments on ICT products are included in the **WTO Ministerial Declaration on Trade in Information Technology Products or ITA Agreement** which India signed in 1997.
- The ITA Agreement, adopted in 1996, is an agreement under which certain WTO member countries agree to eliminate duties on IT products.
- Commitments made by countries under the ITA are binding under Article II.1(a) and (b) of GATT only if they are included in the Goods Schedule.
- The panel held that India's Goods Schedule and not the ITA is the source of the country's legal obligations on tariffs on products including products covered under the ITA.
- The panels further rejected India's argument that its commitments under the ITA are static.
- India argued that its commitments under the Goods Schedule do not cover products of technological innovation that emerged after the conclusion of the ITA.
- The panel ruled that the ITA cannot overrule commitments listed in India's Goods Schedule.
- India's argument based on **Article 48 of the Vienna Convention on Law of Treaties, according to which an error in a treaty would invalidate the state's consent,** was also rejected by the panel.
- India argued that an error was committed during the transposition of its Goods Schedule from the 2002 edition to the 2007 edition.
- The panels accepted India's argument that at the time of the transposition, the country assumed its ITA undertakings restricted the scope of its Goods Schedule i.e. transposition

to the 2007 edition of the HNS did not expand the scope of India's tariff commitments.
- According to the panels, India was alerted that its commitments under the goods Schedule may have expanded during the transposition process.

Can India appeal the decision of the panels?
- It is likely that India will not comply with the panels' recommendation that India reduce its tariff rates and make it compatible with the country's Goods Schedule.
- Compliance with the panel decision would require the dismantling of the country's high tariff wall that had been instituted to boost the domestic production of ICT products.
- **India is likely to appeal the panel ruling based on Article 17 of the Dispute Settlement Understanding (DSU) but the Appellate body that hears such appeals has ceased to exist since 2020 due to the U.S.A blocking appointments of the body's members.**
- Legally, India will not be required to comply with the decision until the appeal is heard and thus the ruling is expected to remain in the void caused by the absence of the dispute resolution body of the WTO.

What is the EU's response?
- The EU and a few other members of the WTO have created an alternative appellate mechanism called the **Multi-Party Interim Appeal Arbitration Arrangement (MPIA)** as per the provisions of Article 25 of the DSU.
- India is not a party to the MPIA and will not use the mechanism to resolve its present dispute.
- Under WTO law, the EU cannot impose trade sanctions on India if it does not comply with the panels' verdict and its appeal remains in the void.
- The WTO law does not permit countries to impose trade sanctions while the appeal is pending.
- **Retaliatory action in the form of trade sanctions can be imposed only following the authorization of the Dispute Settlement Body, composed of all members of the WTO.**
- The EU has also developed a legal mechanism under which the EU can impose unilateral trade sanctions against a country even if it files an appeal against a panel decision under Article 17 of the DSU, which remains unheard of, and also refuses to use the MPIA to resolve the dispute.
- The objective of the EU behind the legal mechanism is to use the threat of trade sanctions as a stick to force countries like India to join the MPIA.
- However, such countermeasures will not be in accordance with WTO law as individual countries like India cannot be held responsible for the absence of an appellate body.

Conclusion
- The absence of an appellate body within the WTO structure has paralyzed dispute resolution between nations.
- Even if sanctions are not imposed by the EU, it might be used as a bargaining chip in free trade negotiations with India.
- India should take care to protect its interests while negotiating trade pacts with individual countries and regional groupings.

On The Washington Declaration

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Washington Declaration
Prepp Mains Booster: Bilateral, regional and global groupings and agreements; Effect of policies and politics of developed and developing countries

Context:
- Recently, **South Korean President Yoon Suk Yeol visited the United States to mark the 70th anniversary of bilateral ties between the United States and South Korea.**
- The signing of the **"Washington Declaration"** as a nuclear deterrent plan was a highlight of the visit.

Background
- South Korea's nuclear development program, which was supported by former President Park Chung Hee, was hampered by US pressure.
- As part of their **"Strategic Arms Reduction Treaty"** in the 1990s, the United States withdrew one hundred nuclear weapons from South Korea.
- The U.S. was hoping to make North Korea unarm itself. Washington made an erroneous assumption that it could deter the weapons production of North Korea by extracting South Korea's nuclear capacity.

What prompted the visit of the South Korean President to the U.S.?
- The successful launch of North Korea's Hwasong-8 solid-fuel **intercontinental ballistic missile (ICBM),** a critical

component for nuclear weapons delivery, had spurred the South Korean President's visit to the United States.
- It intended to advance the strategic relationship by forging an alliance over an extended nuclear deterrent strategy against North Korea's regional aggressiveness.
  - The Washington deal will usher in a new era of Seoul-Washington cooperation.
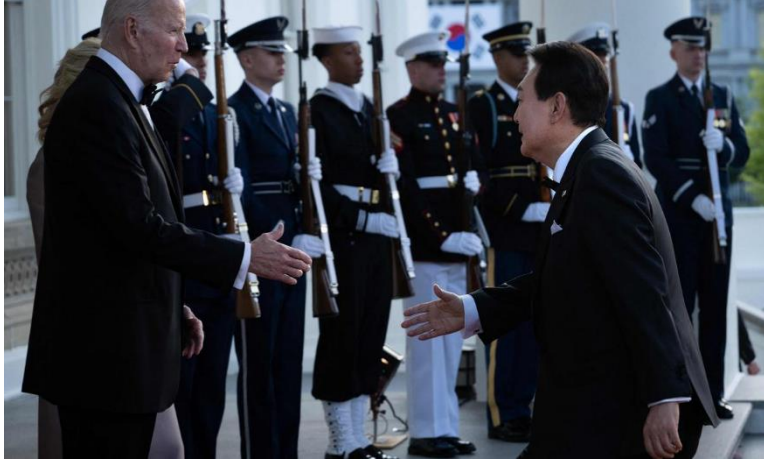
Recent Developments
- The two Presidents announced the formation of a new Nuclear Consultative Group (NCG) to improve extended deterrence, debate nuclear and strategic planning, and manage the threat to the non-proliferation system presented by the Democratic People's Republic of Korea (DPRK).
- The Alliance will work to enable joint execution and planning for Republic of Korea (ROK) conventional support to US nuclear operations in the event of a contingency, as well as improve combined exercises and training activities on the application of nuclear deterrence on the Korean Peninsula.
- In accordance with the Presidents' agreements, the Alliance has built a new bilateral, interagency table-top simulation to deepen our combined approach to nuclear contingency preparedness.

What is the Washington Declaration?
- The declaration outlines that:
  - an American nuclear ballistic submarine would be stationed in the Korean peninsula;
  - a nuclear consultative group would be formed to develop principles of joint response tactics;
  - South Korea would receive intel on nuclear advancements from the US; and
  - the US will strengthen South Korea's nuclear deterrence capabilities through joint military training programs and an annual intergovernmental simulation.
- The proclamation reaffirmed the Non-Proliferation Treaty, meaning that South Korea will not develop its own independent nuclear capability, instead focusing on deterrent measures through an alliance-based strategy.

- It also designates the US President as the 'sole authority' to use the US nuclear arsenal in the event of a nuclear conflict.
- While the agreement's existence is based on South Korea's security needs, the policy reflects big power politics in which the larger power's (US) interests take precedence.

Purpose of the agreement
- The purpose of this agreement is to shield the Korean Peninsula from a nuclear assault by North Korea.
- The US will deploy strategic assets around the Korean Peninsula, and a joint Nuclear Consultative Group will be created to share tactical intelligence, conduct joint training, and coordinate military reactions in the case of potentially hostile moves by North Korea.
- While the decision to use nuclear weapons in such a scenario will be made solely by Washington, the US administration will contribute to symbolic deterrence against North Korea by sending nuclear-armed submarines to the region for the first time in 40 years. These submarines are unlikely to be permanently deployed.

Why is the U.S. not keen on South Korea having a nuclear arsenal?
- **Policy of non-proliferation:** The United States has a long-standing policy of non-proliferation, which means that it seeks to prevent the spread of nuclear weapons to countries that do not currently possess them.
- **In the case of South Korea,** the U.S. is concerned that if it were to develop its own nuclear weapons, it could trigger a regional arms race and increase the likelihood of a nuclear conflict on the Korean peninsula. Moreover, it would likely undermine the international non-proliferation regime and lead to a more unstable global security environment.
- The **U.S. wants to control global nuclear arms production.** It has been reluctant to allow South Korea to develop their own nuclear arsenal as it would hinder the prolonged efforts of controlling nuclear production in the world.
- The **U.S. has security commitments to South Korea** under the Mutual Defense Treaty, which means that it is obligated to defend South Korea in the event of an attack.
- The U.S. believes that the best way to maintain stability and security in the region is through deterrence, which can be achieved without South Korea developing its own nuclear arsenal.

What is the Global response?
- The Washington Declaration proposes a regional nuclear deterrent posture in order to balance power dynamics against North Korea.
  - While the goal is to defuse the threat, opposing actors may perceive physical deployment of the arsenal as a direct threat and use it as leverage to act aggressively.
- **China and Russia have expressed concern** over the recently inked "Washington Declaration" between the United States and South Korea.

- o **China** has voiced its displeasure with South Korea's use of the words "need for peace and stability" in relation to the waters surrounding Taiwan, which has heightened tensions between the two nations.
- o **Russia:** While the Russian foreign ministry criticized the declaration's mention of nuclear energy cooperation, claiming that it would spark an arms race. Russia has repeatedly agitated against what it sees as the United States growing military presence across Asia.
- **North Korea** warned that the announcement would only expose the peace and security of North-East Asia and the world to greater danger.

India's CAG Writes: Blueprint For A Blue Economy

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: Indian Polity
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests, powers, functions and responsibilities of various Constitutional Bodies GS3 - Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Context:
- The author, Girish Chandra Murmu, CAG of India, has discussed the blue economy and the role of the office of the CAG in the article titled "India's CAG Writes: Blueprint For A Blue Economy" published in the Indian Express on 4th May 2023.
- The CAG will chair SAI20, the Engagement Group for Supreme Audit Institutions of G20 countries in Goa in June, in which the two priority topics for discussion are blue economy and responsible AI.

Background
- Leaders of the G20 countries will discuss policy requirements for collective progress, equity, and inclusive growth at the summit meeting with the theme "**One Earth, One Family, One Future**" to be held in New Delhi under India's presidency of the G20.
- India has set forth commitments for green development, circular economy, and lifestyle behavioral changes as part of an actionable plan to achieve the Sustainable Development Goals.
- Events are scheduled to be held across the country to focus on solutions to issues such as climate finance, technology sharing, financial inclusion, and digital public infrastructure.
- The **Engagement Group for Supreme Audit Institutions (SAI) of the G20 countries, SAI20** will be held in June 2023 in Goa and chaired by the [Comptroller Auditor General of India](#).

What has been planned for SAI20?

- The two priority areas selected for deliberation at the SAI20 are
- o **Blue economy**
- o **Responsible AI**
- The SAIs play a critical role in aiding executives in balancing key development concerns and ensuring sustainable development.
- The **SAIs also aid in promoting intergenerational equity and addressing climate change concerns and contribute to ensuring that benefits of economic growth are shared equally across generations.**
- As part of SAI20, the CAG is set to prepare technology-driven tools to assess authorized development in coastal areas and monitor the quality of marine water resources.
- SAI20 member nations are engaged in a collaborative effort to develop globally relevant audit toolkits along with a compendium of case studies and challenges related to the auditing of coastal spaces, which include legal and institutional frameworks, coastal regulation compliance, biodiversity conservation, capacity building and progress towards SDGs.
- **Independence, accountability, and transparency** are the core tenets of SAI20 as these ideals have been prioritized by the CAG as a public audit authority and constitutional office responsible for strengthening democracy and governance.
- The SAI20 has committed to improving the performance of audits and compliance with state finances, local governance as well as environmental auditing.
- In 2022, the CAG released the first **Compendium of Asset Accounts of Natural Resources which was prepared as per the UN's Environmental and Economic Accounts system** which is a guide for the government on how to optimally utilize natural resources.
- The SAI20 Engagement Group will also include the presentation of toolkits prepared by SAI20 under the leadership of the CAG of India which will provide an opportunity for constructive dialogue in order to improve the auditing of ocean-based activities.
- Collaborative efforts will contribute to the capacity building of auditors across the SAI20 member countries and help regional auditing communities such as **ASOSAI (Asia) and AFROSAI (Africa)** by providing a common and replicable auditing tool.

Multilateral Frameworks Related to biodiversity conservation
- In 2018, the **United Nations Environment Programme laid out the Sustainable Blue Economy Financial Principles** which is a financial framework investors can use to fund ocean-based initiatives.
- The Principles can be used as a reference for the impact of marine investment on livelihoods and poverty eradication.

- The global biodiversity framework of the COP 15 has set out four goals and 23 targets that aim to conserve and sustainably use the world's biodiversity.
- These objectives focus on topics such as reducing the loss of biodiversity, ensuring the fair and equitable sharing of benefits from the use of genetic resources, and restoring degraded ecosystems.
- The Principles serve as a framework for strengthened cooperation and coordination among countries and stakeholders regarding the sustainable use of biodiversity.

The Blue Economy and SAIs

- The blue economy includes a wide range of coastal activities which include fishing and tourism.
- It is a critical element of the global economy as **90% of world trade is carried out through sea routes.**
- **The global blue economy is estimated to be worth around $2.5 trillion annually.**
- However, the measurement of the blue economy is challenging due to the existence of diverging definitions and issues encountered while classifying different sectors and sub-sectors.
- Land-based and ocean-based activities could not be properly differentiated between using present models of international economic classifications while the **System of National Accounts** also does not provide a clear understanding of the blue economy.
- Therefore, a new accounting framework that can objectively identify production, trade, and services related to different sectors of the blue economy needs to be developed.
- The Office of the CAG, India has prioritized the creation of compliance standards and a national accounting framework for the blue economy as a long-term objective.
- In August 2022, the CAG tabled its **Conservation of Coastal Ecosystem report** in Parliament with its observations on how the Coastal Regulation Zone (CRZ) notification 2011 & 2019 have been implemented between 2015 and 2019.
- The report examined the efficiency of drivers of development such as project clearances, construction, the institutional capacity to prevent the violation of land and forest resources, community livelihood support mechanisms, and mitigation management plans to conserve biodiverse ecosystems like mangroves and coral reefs that provide protection from extreme weather events like storms and coastal floods.
- The audit made focused recommendations with the aim of helping improve the CRZ ecosystem.
- The **Government of India has earmarked the sector as one of the 10 core sectors for national growth while the Ministry of Earth Sciences developed a National Blue Economy Policy that aims to efficiently utilize maritime resources while preserving the nation's marine biodiversity.**

Ocean-based livelihoods

Way Forward

- Sea-level rise, water temperature, storm surges, and wave conditions are some of the evident signs of climate change.
- Studies indicate that hazards of cyclones and sea-level rise are likely to be higher in the coastal regions as **uncontrolled changes to land use patterns, sand mining, and deforestation have adversely impacted the coastal ecosystem.**
- GIS maps from the European Space Agency reveal that **15% of India's coastal areas have changed drastically between 1992 and 2018 due to anthropogenic influence in the form of agriculture, diminishing forest cover, and urbanization.**
- The country's coastal population is projected to grow from 64 million to 216 million between 2000 and 2060 which has increased the scale of the crisis.
- The construction of **disaster-resilient infrastructure** that can withstand the impacts of hurricanes, typhoons, and tsunamis along the country's coasts is important for coastal communities that are vulnerable to sea-level rise and increasingly regular storms.
- The community and authorities in vulnerable areas should be equipped with adequate **infrastructure including ICT hubs in place as part of early warning systems.**
- The development of disaster-resilient infrastructure is important for the auditing community as auditors are responsible for ensuring that organizations comply with prescribed regulations and standards.

The Horizon For India Beyond The G-20, SCO Summits

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Events of International Importance
Prepp Mains Booster: India and its neighborhood- relations. Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests. Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

Context:

- The author, M.K. Narayanan, former National Security Advisor, has discussed whether hopes of reaping a rich dividend from summitry may be misplaced with the deterioration in the geopolitical climate and the possibility of impending conflict in the article titled " The Horizon For India Beyond The G-20, SCO Summits" published in the Hindu on May 6th, 2023.
- China is seeking to widen the arc of conflict with India, unlike India which seeks to limit it to the border issue.

Summitry Challenges

- India's Presidency of the G20 and the SCO should not blind the country's regime to the challenges faced by the country.
- Expectations of reaping high dividends from heading the two summits should be lowered.
- Although the Prime Minister had spoken about the importance of global peace at the previous summit of the G20 in Indonesia, the world is not closer to securing global peace despite India being at the helm of the G20.
- The present situation indicates a possibility of deterioration in the geopolitical climate and violent conflict.
- **India listed climate change, clean energy, sustainable development programmes, and reform of multilateral institutions as the priorities of its Presidency but these are likely to take a backseat due to the deteriorating global situation.**
- India needs to recognize that the **importance of the G20 is declining and that the SCO seems to be gaining in importance.**
- India, as President of G20, will need to adopt an approach that balances the demands of the SCO and the G20 and accommodate the needs of the Global South.
- Therefore, India should proceed with caution, and hopes of repairing a rich dividend from the summitry may be misplaced.

Conflict in Europe

- Although the world was not yet mired in a global conflict, it is perilously close to happening.
- **Distrust between the two coalitions led by the U.S.A. and China/Russia respectively leaves little room to maneuver for countries like India that have not sided with either of the two opponents. '**
- The U.S.A. and its allies have highlighted their ability to provide Ukraine with the most sophisticated weapons and training for Ukrainian troops.
- Russia too has been supplied with arms and equipment from its allies, especially China.
- As a consequence, Russia and Ukraine possess significant quantities of sophisticated and deadly weapons, and alongside their respective allies are positioning themselves to demonstrate which of the two sets of weapons is superior.

- The process of assembling these weapons arsenals, which began some time ago, peaked in April with nations outside the U.S. and its allies participating in Europe's war.
- Potential suppliers to Ukraine include South Korea, risking the threat of becoming a participant in what could turn into a global conflict in which a single misstep could lead to Armageddon.

Sino-Indian conflict

- **In addition to the threat of war in Europe and tensions in the East Pacific, India faces the challenge of a rampaging China that is employing a strategic-cum-diplomatic offensive across Asia, particularly West Asia.**
- China has also begun to display its naval prowess in the seas around East and Southeast Asia, and its military muscle in the Ladakh and Arunachal Pradesh sectors along the Sino-Indian border.
- China is unlikely to be deterred from its actions by vanilla-laced responses, such as when the Defence Minister stated that improvement in ties with China would depend on peace on the border in his meeting with his Chinese counterpart.
- Such an approach is likely to diminish India's room for maneuver, given that China is also launching other initiatives such as the China-Indian Ocean Regional Forum, whose members include the majority of the Indian Ocean states, to limit India's role in the Indian Ocean Region.
- **While India seeks to limit the conflict with China to the border issue, China seeks to widen the arc of its conflict with India**.
- China is targeting India for getting closer to the U.S. and its allies, its participation in the **QUAD**, and other maritime surveillance exercises with the U.S.A., Japan, and Australia.
- **China is also engaged in building stronger relationships with countries in India's neighborhood** as part of its strategy to counter India's influence in the region.
- West Asia, which was once one of India's closest allies appears to be succumbing to China's diplomatic offensive.
- Consequently, India's influence even in erstwhile friends such as Egypt has waned significantly due to China's initiatives.
- The new **Iran-Saudi Arabia deal mediated by China** is setting the stage for major diplomatic changes across the region, marginalizing India and other nations.
- India is well aware of **China's intentions and its ability to employ hybrid warfare strategies including cyber tactics, engaging in the 'politics of water' by diverting Himalayan rivers and adopting traditional warfare espoused by Sun Tzu like fighting through avoiding the enemy's strengths, and attacking their weaknesses**.
- Therefore, India should remain cautious of Chinese action to undermine its regional influence.

The Neighbourhood and Russia

- India's problems have been compounded by turmoils in its immediate neighborhood.
- Problems in Afghanistan are beginning to affect the nations on its periphery while India has lost all traction with the Taliban's rise to power.
- Similar worst-case scenarios are also taking place in Sri Lanka and Pakistan where economic crises and political instability are rampant.
- India-Russia relations are also approaching a period of uncertainty. **Defense cooperation was key to cementing ties with Russia but the relationship has been sidelined with India looking to Western nations** such as the U.S. for sophisticated weaponry and equipment.
- This has been accompanied by a stronger Russia-China relationship which has led to a strain in Indo-Russian ties.
- Russia's recent critical remarks on the QUAD at the SCO Defence Minister's meeting and the **diminishing relevance of plurilateral bodies involving Russia such as the BRICS and the tripartite Russia-India-China platform have indicated how Russian priorities have evolved**.
- The economic nature of the relationship with Russia is limited and at present based on oil which offers little scope for a dynamic relationship.

Conclusion
- India is one of the few nations in the world to have avoided significant economic harm during the COVID-19 pandemic and the ensuing economic crisis.
- Though largely regarded as a future global power, India still has a long way to go before accomplishing its

predetermined goals and numerous challenges have to be addressed.

To know more about the G20 and the SCO, click the links.

In New 'Quad' Meet With U.S, Saudi And UAE, Doval Discusses Infrastructure Initiatives In Gulf

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Events of National and International Importance

Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests

Context:
- Recently, Mohammad Bin Salman, the Saudi prince, and prime minister, hosted a s**pecial meeting of the national security advisers (NSAs)** of **India**, the **United States**, and the **United Arab Emirates** in the Kingdom of **Saudi Arabia**. This meeting is being considered as another significant **"Quad" in West Asia.**

Significance of the meeting
- The focus of the meeting was **regional infrastructure initiatives.**
- This meeting is particularly noteworthy since it took place only a week after the U.S. NSA's visit to Iran, which recently agreed to restart ties with Saudi Arabia in a meeting brokered by Beijing.
- **Growth and Stability:** According to the Saudi Ministry of Foreign Affairs, the leaders discussed ways to **strengthen relations between their countries to promote growth and stability in the region.**
- **Interconnectivity:** The U.S. White House also released a statement indicating that the meeting aimed to **advance their shared vision of a more secure and prosperous Middle East region** that is interconnected with India and the rest of the world.
- The news portal Axios from Tel Aviv said the meetings on infrastructure were meant to provide a **counter to China's Belt and Road initiative and other inroads in the region.**
- It further added that among the projects is a plan **to connect Gulf countries via a railway network and connect to India** via shipping lanes from "two ports" in the region".

India- US bilateral NSA meet
- The White House in its statement also said Sullivan had met Doval separately to "discuss bilateral and regional matters".
- The bilateral meeting between USA's National Security Adviser Mr. Sullivan and Mr. Doval is one of a number of meetings set over the next few weeks **to prepare for upcoming meetings of Prime Minister Narendra Modi with U.S. President Joseph Biden** this month, and the PM's state visit to the U.S. in June.

- It is the first meeting between Doval and Sullivan after they launched the ambitious India US ICET (Initiative on Critical and Emerging Technology) dialogue in January.
  o The iCET or US-India Initiative on Critical and Emerging Technologies was launched by the two countries in 2022 and has been managed by the National Security Councils of both countries.
  o Under the initiative, 6 areas of cooperation have been identified:
  o Scientific research and development
  o Quantum Computing
  o Artificial intelligence
  o Defence innovation
  o Space
  o Advanced Telecom
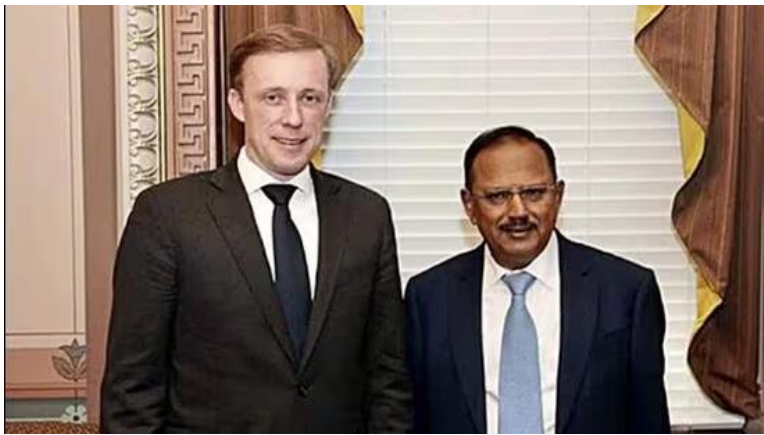
How will it benefit India?

- **Strategic partnership:** India has been working to enhance its strategic partnerships with the Gulf countries, and the Quad provides a platform to take this cooperation to the next level.
- **Security:** The new Quad can make sure that India's interests are not left unguarded because of the vacuum created in the Middle East by Washington's focus on peer competition with China and on Russia's actions in Eurasia.
- **Commerce:** The Middle East can act as a gateway to Europe and Africa. For instance, Indian companies can leverage the UAE as a hub to tap into nearby regional markets of West Asia, Eastern Europe, and Africa.
- **Indian Diaspora:** Instability threatens Indian energy imports and diaspora. India's past inability to influence geopolitics in the Middle East, combined with its lack of security presence, led to costly evacuations of its diaspora. This included the largest evacuation in history when 200,000 Indians were airlifted out of Kuwait during the Gulf War.
- **Expansion of strategic influence:** India has traditionally had strong economic ties with the Gulf countries but has been less successful in expanding its strategic influence in the region. The Quad can provide India with an opportunity to forge stronger political and strategic partnerships with these countries, while also enhancing regional stability.

- **Interconnectivity:** The alliance can be an answer to China's Border Road Initiative which is crictized for being non transparent. This presents an opportunity for India to expand its regional influence and offer an alternative to China's growing presence in the region.

Conclusion

- The Middle East is a critical source of investment, energy, and remittances for India.
- Platforms like this offer a very constructive and progressive stage to India in particular and other member countries in general to counter the aggressive and assertive behavior of China that is posing a serious threat to regional security.
- The rise of the new 'Quad in West Asia could provide Washington with a geostrategic solution to the pressing challenge of the U.S. presence in the region and how to do more with less while connecting the bloc with the new U.S. Indo-Pacific strategy.

Recent High profile engagements
- Mr. Doval's visit to Saudi Arabia is part of a series of high-profile engagements he has had abroad. For instance, he recently visited Tehran, where he met with Iranian President Ebrahim Raisi, NSA Shamkhani, and Foreign Minister Hossein Amirabdollahian. In January of this year, he traveled to Washington D.C. where he held talks on technology cooperation with several senior officials.
- He also visited London where he had meetings with British PM Rishi Sunak and the UK's National Security Adviser, and Moscow, where he met with Russian President Vladimir Putin during a visit for a regional NSA meet.

India-Australia Ties Built On Trust: Modi

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: India-Australia Ties
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests. Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora

Context:

- Recently, Prime Minister Modi stated that mutual respect and mutual trust are the strongest foundations of India-Australia relations and that the Indian diaspora is the real reason behind this.
- The community event also included announcements related to declaring Harris Park "Little India" and India's commitment to opening a consulate in Brisbane.

What did the Prime Minister mention on his visit to Australia

- The Prime Minister of Australia, Anthony Albanese welcomed Prime Minister Modi to Australia by stating that he is the boss.

- The two Prime Ministers were welcomed on their arrival by Vedic chants and a traditional Aboriginal ceremony.
- The Indian Prime Minister claimed that previously India-Australia relations were based on the **3C's i.e. Commonwealth, Cricket, and Curry**.
- Following the 3C's the relations between the two countries evolved to depend on the **3D's – Democracy, Diaspora, and Dosti.**
- The relationship later became all about the **3E's i.e. Energy, Economy, and Education**.
- However, in reality, the depth of the India-Australia relationship transcended C, D, and E aspects.
- He claimed that the **biggest reason behind the strong ties was the presence of the large Indian diaspora in Australia, which had helped build a relationship of mutual respect and mutual trust between the two democracies.**
- The Prime Minister also added that India and Australia, despite the vast distance between them, were connected by the Indian Ocean.
- Despite the difference in lifestyles between the inhabitants of the two countries, there **were cultural links such as yoga, movies, cricket, and tennis that acted as bridges.**

- According to the Prime Minister, India was recognized as the bright spot of the global economy by the IMF, while the World Bank stated that if any country is withstanding global headwinds, it was India.
- The **Indian economy has grown at a healthy tick to reach $3.5 trillion while plans underway intend to reach $32 trillion in the next 25 years**.
- He stated that India does not lack capability or resources and that India has made record exports even in the most challenging of times.
- He also described India as the country having the **world's largest and youngest talent factory.**
- At the community event organized as part of PM Modi's visit, the Australian PM announced that Harris Park in Western Sydney, where the Indian diaspora regularly celebrates festivals such as Diwali and Australia Day, is to be named **Little India.**

- The Prime Minister also announced India's decision to fulfill a long-standing demand of the Indian community in Australia and open a consulate in Brisbane.

Significance of the visit

- The Prime Minister's Australia visit is the third leg of his three-nation tour including Japan and Papua New Guinea.
- He also met with the top business leaders of Australia and called for enhanced cooperation with the Indian industry in areas such as technology, skilling, and clean energy.
- He also highlighted the reforms and initiatives undertaken by India and invited Australian firms to partner with India in technology, investment, and skilling in the mining and minerals sector.
- The two Prime Ministers earlier met in New Delhi in March 2023 where they discussed security and defense cooperation in the Indo-Pacific, developing credible and robust supply chains, and clean energy sources such as solar and hydrogen.

India-Australia Relations

- India's ties with Australia can be traced back to 1788 following the arrival of the Europeans in Australia.
- The East India Company in Kolkata supervised all trade between New South Wales, which was a penal colony, and other countries.
- The establishment of the India Trade Office in Australia in 1941 marked the beginning of diplomatic relations.
- However, the ties between the two countries improved following the end of the World War while the economic reforms of 1991 led to India seeking out new partners for development.
- Ties between the two countries reached their lowest point following Australia's condemnation of India's nuclear tests in 1988.
- **In 2020, India and Australia agreed to elevate their relationship from a Strategic Partnership to a Comprehensive Strategic Partnership.**

Shared Values:

o Both countries are pluralistic, Westminster-style democracies and members of the Commonwealth,
o Expansion of economic engagement and regular high-level interaction
o The two countries have been described as strong, vibrant, secular, and multicultural,
o They both possess a free press and an independent judicial system

Defense Commitments:

o India and Australia signed the **Mutual Logistics Support Agreement** in 2020 to enhance defense cooperation.
o The Defence and Foreign Ministers of both countries have met as part of the **2+2 Ministerial Dialogue**.
o Both countries are participants in **Ex Malabar, Ex Kakadu, Ex Pitch Black,** and **Ex RIMPAC.**

- India has also been invited to participate in the **Talisman Sabre** exercise in 2023.

Economic Cooperation:

- India signed the **Economic Cooperation Trade Agreement (ECTA) with Australia in 2022**, the country's first with a developed nation in a decade. The countries are currently in discussions to expand the ECTA into a **Comprehensive Economic Cooperation Agreement (CECA).**
- India and Australia along with Japan are partners in the **Supply Chain Resilience Initiative.**
- **Australia was India's 13th largest trading partner in 2022-23 with exports worth $6.95 billion and imports worth $19 billion.**
- The countries aim to ensure bilateral trade reaches $100 billion by 2030.
- India is Australia's largest market for its export commodities such as gold and chickpeas, the second-largest market for coal and copper ores, and the third-largest market for lead and wool.
- In 2023, the two countries signed the **Mechanism for Mutual Recognition of Qualifications** which was aimed at facilitating the mobility of students between India and Australia.

Multilateral Cooperation:

- India and Australia are members of a number of multilateral fora such as the **International Solar Alliance, the QUAD, the Commonwealth, the Indian Ocean Rim Association, G20, India-Pacific Infrastructure Partnership (IPIP), the Indo-Pacific Economic Framework (IPEF) and the World Trade Organization (WTO)**, etc.
- India and Australia signed an **MoU for space cooperation between ISRO and the Australian Space Agency in 2022** and a **uranium supply deal with India in 2014**.
- In 2022, the two countries signed a **Letter on New and Renewable Energy for Cooperation** which is aimed at reducing the cost of renewable energy technologies.

The Problem With India's Multi-Alignment Stand

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: International Relations

Prepp Mains Booster: Effect of policies and politics of developed and developing countries on India's interests; Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests.

Context:

- This article is written by Vinay Kaura, Assistant Professor, Department of International Affairs and Security Studies, Sardar Patel University of Police, Security and Criminal Justice, Jodhpur, and a Non-resident Scholar at the Middle East Institute, Washington DC.
- In this article, the author discussed the approach taken by India in the present Ukraine-Russia conflict.

India's current stance

- **Use of Soft power:** India has used varied symbolic instruments of power to enhance its soft power appeal. Mr. Modi has **spoken to Mr. Zelenskyy** many times and had expressed **India's solidarity with Ukraine** while extending support for peace efforts.
- The Indian Prime Minister had publicly told Mr. Putin that **"today's era is not of war" —** a remark that seemed to be a reprimand to Moscow.
- **Ambiguity:** Even though India has expressed its disapproval of the Ukraine war, it has avoided taking a clear position in many UN resolutions on the issue.
- India sympathizes with Ukraine as a victim of aggression, but this does not undermine its historical ties with Russia.
- The country's historical relations with Russia are founded on both the anti-colonial element of India's ideology of strategic autonomy and New Delhi's military dependency on Moscow.
- At the same time, India avoided commenting on NATO, whereas other countries like China have effectively positioned themselves in **opposition to the American approach** by holding the **North Atlantic Treaty Organization's eastward expansion responsible for instigating** the war and further cementing the Beijing-Moscow relationship.

What are the problems with India's current stand?

- **Against Vishwaguru ethos:** Emine Dzhaparova, the deputy foreign minister of Ukraine, stated (in a widely circulated tweet) that "India wants to be the Vishwaguru, the global teacher and arbiter," on her recent visit to New Delhi.
- The implication is that if India chooses **not to take a strong moral stand against Russia's violation of Ukraine's sovereignty,** the 'Vishwa Guru' image that the administration aspires for the **nation would remain flawed.**
- Vishwa Guru's image is rooted in India's political thought and **highlights the country's cultural ethos and civilizational values**. It also draws attention to the distinctive role of 'soft power' in foreign policy discussions.
- **Sovereignty:** India's views on sovereignty converge with a universally acceptable Westphalian notion(the state

possesses exclusive sovereignty over the territory that it controls) and thus clash fundamentally with communist **political philosophy of 'might is right'.**

- **Against aspirations to be a permanent member of the UNSC:** Critics argue that this ambiguity does not align with India's aspirations to be a permanent member of the UNSC, which requires speaking **out against territorial aggression and rights violations** like those committed by Russia in Ukraine.

Conclusion

- A pursuit of 'multi-alignment' may have given India some diplomatic space in the ongoing war in Ukraine. However, it may not be sufficient for India to try to play the role of a mediator between Russia and Ukraine.

A North-South Asia Corridor Is A Step In The Right Direction

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: International Relations
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests

Context:

- Recently, **National Security Advisers (NSAs) of the US, India, and the UAE met with Saudi Prince and Prime Minister Mohammad Bin Salman in Saudi Arabia** discussed a shared vision of a more secure and prosperous **Middle East region interconnected with India and the world.**
- o The idea of the new initiative came up during talks held over the last 18 months in a forum called **I2U2, which includes the US, Israel, the UAE and India.**

Key points of the meeting

- The summit in Saudi Arabia was organized to explore a plan to **connect nations in West Asia via rail networks and highways,** as well as to develop maritime routes connecting the area to South Asia.
- This enormous endeavor is undoubtedly a reaction to **China's Belt and Road Initiative (BRI),** which Beijing has exploited to expand its reach across Asia.
- Fears about China's "debt trap" and the recent lessening of hostilities between West Asian competitors make the infrastructure project appear attractive and practical.
- Indian railway skills, recently displayed in Sri Lanka, may be put to good use while also helping to cement the country's status as a major project executor.
- Direct corridor between West Asia and the Indian Subcontinent will enable a more consistent and stable supply of crude oil, therefore bolstering the country's energy security.
- A stronger, more direct presence of Indian firms and the government in the area can improve the prospects of millions of Indian employees.

Why is West Asia significant?

- West Asia connects three continents: Asia, Africa, and Europe. It's known as the Asia-Africa Gateway and Europe's Back Door.
- The continent of West Asia meets three seas: the Mediterranean, Red, and Arabian Seas. It is an international commerce hub with several areas.
- o The world's two most vital waterways, the Bosphorus and the Dardanelles, are both located here.
- The discovery of oil in this area has significantly boosted its significance. The international powers have intervened in this region due to strategic concerns.

Significance of the meeting

- It is a step forward in India's outreach to West Asia, building on the endeavor launched with the I2U2 grouping of India, Israel, the United States, and the United Arab Emirates in October 2021.
- o This is especially significant in light of recent events, which have given the impression of a diminishing American role and a rising Beijing-Moscow presence in the region, ranging from the hasty and poorly executed US withdrawal from Afghanistan and the return of the Taliban to China ostensibly brokering peace between Iran and Saudi Arabia earlier this year.
- The conference implies a bigger, integrated strategy to India's West, maybe comparable to the Indo-Pacific, in collaboration with the US and regional allies.
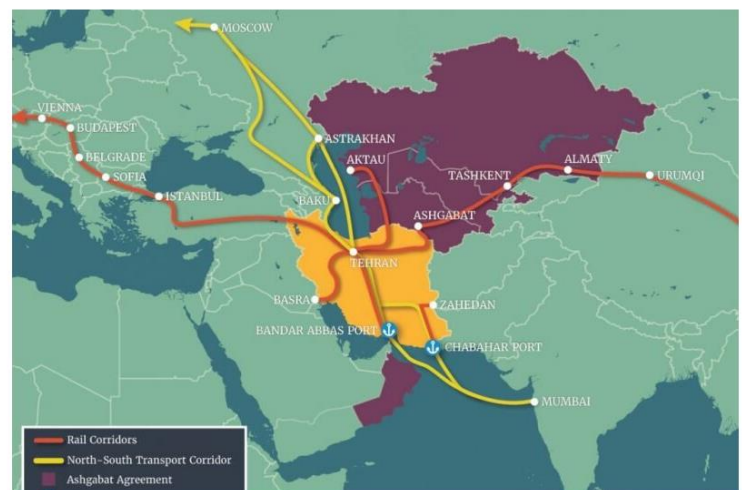
About I2U2

- The I2U2 project is a new partnership between India, Israel, the United States, and the United Arab Emirates.
- The acronym 'I2' refers for India and Israel, whereas 'U2' stands for the United States and the United Arab Emirates.
- This is an outstanding achievement that reflects the geopolitical shifts taking place in the area.
- This will not only rejuvenate and re-energize the global alliance and partnership structure, but it will also weave

together relationships that did not previously exist or were not leveraged to their full potential.

About China's Belt and Road Initiative (BRI)

- China's Belt and Road Initiative (also known as One Belt, One Road (OBOR)) envisions the development of a network of road, rail, and port projects across several nations.
- It aspires to bolster Beijing's economic leadership with a massive infrastructure-building initiative in China's neighboring areas.
- This endeavor is known as the "21st century silk road," and it consists of an overland corridor belt (also known as the silk road economic belt) and a marine road with shipping routes.

Objective of India's participation

- **China's influence in the West Asian region:** Beijing has expanded its area of political influence in the West Asian region through what Delhi calls "mission creep" – the breakthrough in ties between Saudi Arabia and Iran took India by guard.
- **India's interests in West Asia:** This project may have repercussions for India's interests in West Asia, which supplies energy security. Such a link will allow for speedier crude transfer while lowering India's long-term expenses.
  o The improved connectivity would also benefit India's eight million residents who live and work in the Gulf region.
- **Infrastructure builder:** The project would assist India in developing a brand as an infrastructure builder in the railway industry. With a robust rail network at home and the experience of building similar infrastructure in Sri Lanka, India is confident in doing so abroad.
  o It encourages private and public sector organizations to investigate possible economic and infrastructural prospects in the region.
  o This will also have the impact of opposing the Chinese Belt and Road Initiative, which has saddled several nations in the area with infrastructure of minimal use.
- **India's connectivity to its western neighbours:** The government believes that Pakistan's obstruction of overland transport routes has long hindered India's connectivity with its western neighbors.
  o India wishes to employ marine routes to access West Asian ports. Chabahar and Bandar-e-Abbas (Iran), Duqm (Oman), Dubai (UAE), Jeddah (Saudi Arabia), and Kuwait City are among them.
- Connectivity projects crisscrossing the Gulf and Arab nations, with Indian stakes, increase commercial potential.

Green Crosshairs: On The Impact Of The European Union's Carbon Border Adjustment Mechanism

Priority: Medium
Primary Source: The Hindu

Prepp Prelims Booster: Carbon Border Adjustment Mechanism
Prepp Mains Booster: - Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests, Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora, Infrastructure: Energy, Conservation, environmental pollution and degradation, environmental impact assessment.

Context:

- Recently, the European Union proposed to introduce the Carbon Border Adjustment Mechanism (CBAM), a framework for levying a carbon tax on products that rely on non-green or suboptimally sustainable processes and where carbon emissions are deemed to have not been adequately priced, by October 2023.
- The CBAM poses a significant threat to some of India's biggest exports to the European Union such as iron and steel, engineering products, etc.
- As the voice of the global south, India has a key role to play in galvanizing other countries to take on the EU's carbon tax framework.

What is the EU's Carbon Border Adjustment Mechanism?

- The **European Union** proposed to introduce a framework for levying a **carbon tax on the import of products that rely on non-green or sub-optimally sustainable processes and those where carbon emissions are deemed to have not been adequately priced.**
- The mechanism called the **Carbon Border Adjustment Mechanism (CBAM)** is set to start in October 2023 with an import monitoring mechanism and begin the levy of duties as determined from January 2026.
- The list of products covered under the CBAM will be expanded over time and will cover all products exported into the EU by 2034.
- According to the EU, the CBAM will **ensure that its climate objectives are not undermined by carbon-intensive imports and boost the adoption of cleaner production processes around the world.**

Objectives:

o Reduce carbon emissions from imported goods

o Promote a level playing field between the EU and its trading partners
o Protect EU companies that invest in green technologies
• CBAM taxes would be imposed on the carbon content of imported goods on the border based on the carbon price in the **EU Emission Trading System (EU ETS)** which currently covers industries such as cement, steel and power generation, etc.
• Revenue generated from the CBAM would be utilized to fund the EU's climate objectives such as climate-friendly investments and support the efforts of developing countries.

How will the CBAM affect India?

• The CBAM poses a significant threat to some of India's biggest exports to the EU such as iron and steel, with carbon levies estimated to be between 19.8% to 52.7%.

India-EU trade

• In 22-23, India's exports to EU countries were worth $66,941.79 million (16.37%) and imports from the region were worth $54,368.89 million (8.29%).
• Exports to the European Union comprised the second largest portion of India's exports behind North America(19%).
• The European Union countries had the fourth largest share of imports into India behind NE Asia, West Asia and the GCC, and the ASEAN region.
• According to the Ministry of Trade and Commerce, India's exports of iron and steel to the EU were worth around $ 3555.65 million in 2022-23, down from $5965.33 million in 21-22.

• The Union Minister for Commerce and Industry stated that it was too early to estimate the impact of the tax on exports from the country.
• However, trade experts have recently claimed that this was a risk and one of the top items on the government's agenda.
• It is critical that India reacts with urgency to the **CBAM, which has been interpreted as a sophisticated trade barrier disguised as greenwashing.**
• In 2022-23, one-third of India's exports of steel, iron, and aluminum were to member nations of the EU.
• Under the mechanism, Indian exports of iron and steel to the EU were likely to attract increased scrutiny from October 2023.
• The **tariffs imposed on iron, steel, and aluminum commodities were expected to be raised up to 20-35%. This would exceed the EU's bound tariff rate of 2.2% for manufacturers at the WTO** and increase costs resulting in the loss of billions of dollars for exports.
• Experts also claimed that engineering products, which was the driver of export growth in recent years, would be impacted as well.

• Larger players in these sectors were transitioning to greener technologies and processes but the transition required time, especially for the smaller enterprises to switch away from legacy carbon-intensive technologies such as blast furnaces used in the manufacture of steel.
• Other products covered under the CBAM such as fertilizers, cement, and fertilizers were not likely to affect India as Indian exports of these products were minimal. However, the impact could increase as the list is expanded after 2026.
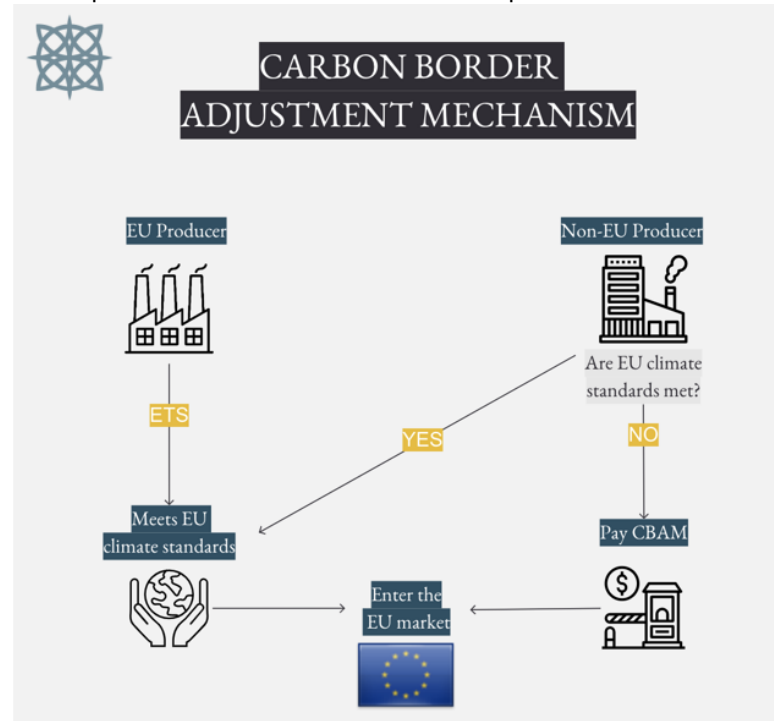
Way Forward for India

• Although the EU has stated that the CBAM is compliant with the norms of the WTO, India may highlight the mechanism's incompatibility with the **UN's climate change framework which recommends common but differentiated responsibilities.**
• However, these arguments, even if upheld, lacked options for their enforcement.
• Therefore, the threat o**f retaliatory tariffs** is among the potential responses being assessed by India while the country plans to quantify the various carbon taxes levied in India.
• India, which has positioned itself to act as the voice of the global south, must use its position as the President of the G20 to galvanize efforts to challenge the EU's CBAM framework.
• India must highlight not only its own concerns with the CBAM but also the more dire implications of the mechanism on poorer countries that are more heavily dependent on mineral resources than India.

Carbon Taxes

- A carbon tax is a form of pollution tax imposed on the use of carbon-based fuels and products like fossil fuels which emit greenhouse gases.
- The aim behind the imposition of carbon taxes is to reduce the emissions of greenhouse gases and combat climate change by incentivizing the shift to cleaner technologies.
- The first carbon tax was proposed by David Gordon Wilson in 1973.
- Carbon taxes are considered more beneficial than the price and cap system in place at present.
- Carbon taxes were first imposed in the 1990s in Nordic countries such as Finland (1990), Sweden (1991), Noway (1991), and Denmark (1992).
- According to the UN, around 23 countries have imposed carbon taxes, mostly at the national level.
- India does not have an explicit carbon tax at the national level but some states have imposed similar taxes such as the **Green Cess in Goa**.

To know more about carbon taxes, click the link.

IPEF And RCEP

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Indo-Pacific Economic Framework
Prepp Mains Booster: - Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

Context:

- This article is written by Parminder Jeet Singh, working with IT for Change, a Non-Governmental Organization.
- The author has discussed how the U.S.-driven **Indo-Pacific Economic Framework** would impact the economic systems of the participating countries.
  - IPEF is a US-led initiative launched in May 2022, by the Biden Administration that seeks to strengthen economic partnership among participating countries, with the objective of enhancing resilience, sustainability, inclusiveness, economic growth, fairness and competitiveness in the Indo-Pacific
- Recently, Prime Minister Narendra Modi advocated for a free and open Indo-Pacific region and committed to assisting with the developmental goals of member nations at the FIPIC summit in Papua New Guinea.
- The Prime Minister of PNG, James Marape, urged India to serve as the voice of the Global South in the G7 and G20.

How IPEF is different from RCEP?

RCEP	IPEF
• The Regional Comprehensive Economic Partnership (RCEP) is a	• **USA:** Developing a **strategic partnership** with the U.S. is India's top foreign policy priority.
comprehensive free trade agreement being negotiated between the **10 ASEAN Member States and ASEAN's free trade agreement (FTA) partners viz. Australia, China, India, Japan, Korea and New Zealand.**	• India joined the Indo-Pacific Economic Framework that seeks an open, inclusive, interconnected and secure Indo-Pacific for sustainable growth of the region.
• India withdrew from the **Regional Comprehensive Economic Partnership (RCEP).**	• US-led trade initiative that aims to counter China's aggressive expansion in the region.
• **Problems due to China:** Major issues that were unresolved during RCEP negotiations were related to the exposure that India would have to China. This included India's **fears that there were "inadequate" protections against surges in imports** and **escalating tensions with China** were the major reasons behind India's decision.	• Unlike traditional trade blocs, IPEF members **won't negotiate tariffs or ease market access.**
	• The framework is perceived as a bid by the US to assume a larger role in the economic sphere and regain credibility following former president Donald Trump's decision in early 2017 to pull out of the Trans-Pacific Partnership (TPP).

What are the issues with IPEF?

- **Vague and misleading Language :** It is claimed by critics that the language used in the Indo-Pacific Economic Framework for Prosperity (IPEF) is intentionally v**ague and misleading.**
- Traditional free trade agreements are much more focused but still take years to conclude.
- The relatively high-level language of the IPEF is being used as an excuse to rush it through. However, this phrasing is exactly the kind that would **unknowingly trap countries into economy-wide irreversible commitments,** severely

restricting their ability to make domestic policy, and whose true ramifications won't be apparent for some time.

- **Advantageous to the US:** According to an early analysis by numerous experts, the IPEF would result in a total control over the economic systems of the member **countries, entirely to the benefit of the U.S.**
- The IPEF is really about developing a strategic-economic bloc — an integrated economic system centred on the U.S., and, as importantly, excluding China.
- The systemic integration caused by the IPEF's long-term impacts **will leave little room for domestic measures** to support a nation's own industrialization (for instance, through the IPEF's numerous components' tight supply chain integration).

India

- The IPEF has four pillars namely, trade, supply chains, clean economy, and fair economy however India has joined three leaving trade pillars fearing potential risks and there is a possibility that India may ultimately give in to this pressure.
- However, the other pillars too contribute to developing **hard new economic architectures and structures that are not tariff-based and i**n the long run,could have an even stronger effect on economic and trade flows than tariffs.
- **Lack of freedom:** In the digital arena it is said that 'code is law, and architecture is policy'.
- **Integrated supply chains** and **giving up policy space** in crucial areas like digital, labour and environment, and export restrictions would result in **permanent economic dependency** in a world that is becoming more and more digital.
- **Affect Domestic Industry:** The IPEF has already been shown to have significant effects on agriculture, including the u**sage of genetically modified seeds and foods**, the l**oss of policy space for Big Tech regulation**, and a possible **compromise of a manufacturing industry's comparative advantage** due to unfair labour and environmental norms.
- It would also have a significant impact on India's capacity to build a vibrant domestic ecosystem in developing industries like the digital economy and green products.

Conclusion

- The main economic concern with China was the impact on India's manufacturing industry and the influx of cheap Chinese goods into Indian markets.
- But the economic issues with the U.S. have been no less problematic, e.g. about agriculture, intellectual property, labour and environment standards, and the digital economy.
- Strategic partnership should not mean accepting a completely **U.S. self-interest-driven economic framework** that does not suit India's current economic interests.

What is the Indo-Pacific Economic Framework (IPEF)?

- The IPEF partners through this initiative aim to contribute to cooperation, stability, prosperity, development, and peace within the region.
- The 14 IPEF partners represent 40 percent of the global GDP and 28 percent of global goods and services trade.
- **Pillars:** The IPEF is designed to be flexible, meaning that IPEF partners are not required to join all four pillars.
  o **Trade;**
  o **Supply Chains;**
  o **Clean Energy, Decarbonization, and Infrastructure; and**
  o **Tax and Anti-Corruption.**
- **Members:** There are 14 countries participating in the Indo-Pacific Economic Framework (IPEF): the United States, Japan, Australia, New Zealand, the Republic of Korea, India, Fiji, and seven ASEAN countries (Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam).

What did the PM mention in his address at FIPIC-23?

- Prime Minister Narendra Modi highlighted the importance of the 14 members of the **Forum for India Pacific Islands Cooperation (FIPIC) in a summit at Port Moresby,** the capital of Papua New Guinea.
- He claimed that the small island states of the region are actually large ocean states.
- In addition to the demand for a **free and open Indo-Pacific,** India also promised its support to the Pacific Island states in every possible way.
- The Prime Minister claimed that it had been a long time between a meeting of India and the Pacific island states during which the pandemic and several other challenges had to be faced by the world.
- In addition to the **preexisting challenges such as climate change, natural calamities, poverty, and famine, the Prime Minister cited the hurdles faced by supply chains of food, fertilizers, fuel, and pharma as the reason for emerging challenges.**
- He reminded the delegates of the old adage "a friend in need is a friend indeed" and also claimed that those who were thought to be reliable were not staying with us and that India had supplied vaccines, medicines, wheat, sugar, etc to countries during their time of need.
- He further **assured the FIPIC states of India's support in sustainable development, science and technology, and space applications.**

Japan, South Korea Mend Ties In Landmark Regional Shift

Priority: Low

Primary Source: The Hindu

Prepp Prelims Booster: Events of International Importance

Prepp Mains Booster: Bilateral, regional, and global groupings and agreements involving India and/or affecting India's interests. History of the world - Events from the 18th century such as industrial revolution, world wars, redrawal of national boundaries, colonization, decolonization.

Context:

- Recently, the leaders of South Korea and Japan met for their second summit in Seoul in less than two months. They pushed to mend long-running historical grievances and boost ties in the face of North Korea's nuclear program and other regional challenges.
- Japanese Prime Minister Fumio Kishida became the first Japanese leader to visit Seoul in 12 years. The visit followed a trip to Japan in March by South Korean President Yoon Suk Yeol.

Why is it important?

- Japan and South Korea ties could have broad implications for the region.
- The current visit has seen both sides to explore closer economic and defense ties.
- **Security:** The two leaders seek deeper ties **amid nuclear threats from North Korea and China's increasing assertiveness.**
- Improved ties between South Korea and Japan could pave the way for the two U.S. allies to cooperate more closely on shared security concerns related to China and North Korea.
- **Commerce:** Restoring trade relations could relieve pressure from global high-tech supply chains.
- The East Asian neighbors, both crucial security allies of the United States, have long been at odds over historic issues linked to Japan's brutal 1910 to 1945 colonial occupation of the Korean peninsula, including sexual slavery and forced labor.

How are both countries trying to resolve the issue?

- According to the March agreement, the reparations will be paid by a **joint fund rather than** being solely funded by Japanese corporations, two of which had in 2018 faced legal

action in South Korea due to their conduct during the 1910–1945 occupation.
- Tens of thousands of Korean women were also forced into sexual slavery by the Japanese Army.

Challenges

- South Korean President Yoon Suk Yeol has faced **criticism at home for not securing deeper apologies** or compensation from Japan for wartime atrocities, while Japanese leaders have been **hesitant to agree to such demands** due to their own domestic political considerations and a denialist attitude among some conservatives.
- Japanese leaders have repeatedly emphasized that everything had already been settled through the 1965 deal and refuse to offer a formal apology in specific terms about Japan's wartime crimes against Koreans.
  - Under the 1965 treaty, South Korea received a package of $300 million in economic aid and $500 million in loans from Japan in exchange for Seoul considering all pre-treaty compensation issues settled.
  - The money was largely spent to rebuild its infrastructure and economy ravaged by the 1950-53 Korean War, but former forced laborers began to demand compensation in the 1990s.
- It is difficult for Koreans to comprehend why Japan won't confront its own violently aggressive past.
- Before stepping up shuttle diplomacy to jointly counter North Korea's nuclear missile threats, Kishida must also remove bilateral barriers in other areas, such **as restoring Korea's white list status in commerce.**

Timeline of events

- **1910-1945:** Japan effectively colonized the Korean Peninsula between 1910 and 1945, in a regime that imposed Japanese names and language on Koreans and conscripted many into forced labor or forced prostitution (Comfort Women) in military brothels before and during World War II.
- **Post world war II:** In 1965, Japan paid South Korea's military-run government $800 million in reparations; however, the money was never given to the victims. When the government apologized in 1995, a semi-government fund provided compensation to former "comfort women," but many South Koreans think that the Japanese government needs to bear more of the responsibility for the occupation.
- **Territorial:** The two sides also have a protracted territorial disagreement over a group of islands that are claimed by Japan but controlled by South Korea.
- **Present status:** Seoul and Tokyo have attempted to establish better ties before. In 2004, leaders began regular visits, but these ended in 2012 after South Korean President Lee Myung-bak visited the disputed islands.

- Tensions grew in the last ten years as the conservative Japanese governments moved to rearm the nation while intensifying efforts to downplay atrocities committed during World War II.
- In 2018, the South Korean Supreme Court ordered compensation for victims of forced labor from Nippon Steel and Mitsubishi Heavy Industries in Japan.
- Japan reportedly retaliated in 2019 by imposing export restrictions on chemicals used to produce semiconductors and screens for smartphones and other high-tech products.

Why Has The Arab League Reinstated The Membership Of Syria After More Than A Decade Of Suspension?

Priority: Medium

Primary Source: Indian Express

Prepp Prelims Booster: Arab league

Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

Context:

- Recently, the Arab League voted to reinstate Syria after its suspension nearly ten years ago, underlining the thawing relations between the Arab states and Damascus.
- The resolution permitted Syrian President Bashar al-Assad to attend the Arab League Summit in Saudi Arabia in May and called for an end to the civil war in the country and the consequent drug smuggling and refugee crises.

What is the Arab League?

- The Arab League is a pan-governmental organization of the Arab states in the Middle East and North Africa.
- Also known as the **League of Arab States**, it was **established in 1945 with Egypt following the adoption of the Alexandria Protocol in 1944.**
- **Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, and Syria were its founding members.**
- Today the League consists of **22 members** including the five original nations- Algeria, Bahrain, Comoros, Djibouti, Kuwait, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Somalia, Sudan, Tunisia, the United Arab Emirates, and Yemen.

Objective:

- o Strengthen and coordinate political, economic, cultural, and social initiatives
- o Promote mediation among members and with third parties.
- o The members also committed to joint defense and economic coordination
- **Each member state has one vote in the Council and decisions are binding only for those states that have voted for them.**
- The **Council** is the highest body of the Arab League and meets at the level of Arab leaders annually.
- Although the League makes decisions on a majority basis, there is **no mechanism to comply members to follow resolutions adopted by the body.**
- The League also has **specialized bodies such as the Council of Arab Economic Unity(CAEU), the Arab Labour Organization, and the Arab Monetary Fund,** etc associated with it.
- It has been criticized for collective inaction on important matters and the prevalence of internal conflicts in member states.

What has the Arab League decided on Syria?

- On May 7th, the **members of the Arab League voted to readmit Syria as a member after its membership was suspended in 2011 following the brutal crackdown on pro-democracy protests by President Bashar al-Assad.**
- The consequent civil war which is still going has killed around half a million people and displaced nearly 23 million.
- The decision highlighted the thawing relationship between Damascus and the other Arab states.
- The vote was conducted at a closed-door meeting attended by 13 of the 22 member countries in Cairo, Egypt.
- The resolution which permitted Assad to attend the upcoming Arab League Summit in Saudi Arabia on May 19th also called for an end to the civil war and the resulting drug smuggling and refugee crises.
- A **committee including Egypt, Saudi Arabia, Lebanon, Jordan, and Iraq will soon be created to ensure Syria achieves these goals.**

- The Secretary-General of the League stated that the readmission did not mean the Syrian crisis was over but allowed the Arab states to communicate and discuss the problems with the Syrian Government.
- He also claimed that all countries in the Arab League had not normalized relations with Syria.
- While the UAE had lobbied for Syria's readmission, others like Jordan, Kuwait, and Qatar have opposed full normalization until a conclusive political solution is achieved for the Syrian crisis.

Why did the Arab League decide to reinstate Syria?

- The Arab League's decision to reinstate Syria is a result of the diplomatic efforts made by Assad which gained momentum in the aftermath of the **earthquake in Syria and Turkey in February 2023.**
- The quake which had killed thousands helped the President rebuild ties with rival countries, seek humanitarian aid, and find an end to the sanctions imposed on Syria by Western nations.
- According to experts, countries like Egypt and Oman supported Syria not just because of the humanitarian crisis but also because they realized that ending Syria's isolation was necessary for the stability of West Asia.
- These countries also sought the repatriation of refugees back to Syria and steps to curb the trade of captagon.
- **Captagon is a highly addictive amphetamine, produced widely in Syria's multi-billion dollar drug industry, from which Saudi Arabia and Jordan are facing an addiction problem.**

What was the International Response to the decision?

- The United States of America has criticized the Arab League's resolution and said that Syria did not deserve to be reinstated but supported the League's long-term objective of solving the Syrian political and humanitarian crisis.
- According to the Director of the Council for Arab-British Understanding, the global community with the exception of Russia had renounced any responsibility for Syria.
- As a result, a vacuum was created which has been filled by the regional powers as they see Syria as too big and significant a region for it to be ignored.

- Analysts have also highlighted the importance of the **China-mediated reestablishment of diplomatic relations between Saudi Arabia and its traditional rival Iran in March 2022.**
- The ease in tensions between Riyadh and Tehran has aided Syria which has received reliable support from Tehran since the start of the civil war.
- Other countries in the region such as Kuwait and Jordan fear that the decision to reinstate Syria would set a dangerous precedent.
- The decision to reinstate Syria without holding it accountable for the atrocities committed against its own citizens such as barrel bombing and poison gas attacks.
- The director of the advocacy group, The Syria Campaign, has stated that the Arab states have prioritized their **realpolitik** and diplomatic agendas over basic humanity.
- She also said that the reinstatement could grant Assad impunity to continue his war crimes and other humanitarian offenses.

Conclusion

- The restoration of Syria's membership is a significant victory for Assad's regime but symbolic as sanctions imposed by Western countries are still in place and the return to the Arab League is not expected to lead to a quick release of funds for reconstruction in the war-torn economy.
- Further normalization in ties and consequent easing of sanctions can be expected if Syria manages to resolve its civil war and curtail the rampant drug trade that operates in the country.
- However, experts were uncertain about what steps the Assad Government would adopt to resolve the crisis and how effective it would be.

GENERAL STUDIES 3

Indian Economy

Climate Adaptation To Cost India Rs 85.6 Lakh Crore By 2030: RBI

Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: Indian Economy
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:

- Recently, the Reserve Bank of India Report on Currency and Finance estimated the total cost of climate adaptation for India to be ₹85.6 lakh crore by 2030.
- According to the report, sector-specific climate mitigation policies can help address the crisis.

What has the RBI Report revealed on climate mitigation?

- The **RBI Report on Currency and Finance** is prepared annually by the **Department of Economic and Policy Research of the RBI.**
- The theme of the 2022-23 edition of the report is "**Towards a Greener Cleaner India**". In the previous year, the Report's theme was "Revive and Reconstruct".
- According to the report, I**ndia's green financing needs required to reduce the infrastructure gap could be worth at least 2.5% of the country's annual GDP.**
- The **cumulative expenditure needed for adapting to climate change in India is estimated to be around ₹85.6 lakh crore by 2030**.
- The report stated that the emission intensities of various sectors of the economy varied and that it is not advisable to adopt a common climate mitigation strategy for the entire economy.
- The report claimed that a greener and cleaner economy for the future could result in a shrinking economy similar to India's experience during the initial years of the pandemic.
- According to the RBI, the impact of the transition is expected to be minimal for a developing country when following the Current Policies in the 2030 Scenario as mentioned in the report.
- However, even in this case, the GDP is expected to shrink by 1.19%.

Other Highlights of the Report

- The Report is categorized into four chapters The Climate Strikes Back, Macroeconomic Effects of Climate Change In India, Climate Change and Financial Sector, and Policy Options to Mitigate Climate Risks.
- The Report recommended that **Central Bank Digital currencies (CBDC) can be more eco-friendly than alternative cashless methods** as they are instant, and final and relied less on clearing corporations and settlement infrastructure, which helped reduce energy consumption.

- **Public Sector Banks are more vulnerable than private sector banks on the basis of the climate stress tests** i.e. the climate-related losses faced by the financial system.
- The Report concluded that **India could lose around 3-10% of its GDP by 2100 due to climate change and that around 34 million jobs could be lost by 2030 due to heat stresses.**
- The Report has mentioned the following policy options to mitigate climate risks:
- **Fiscal:** Carbon taxes, Emission trading systems, identification of sustainable green assets via a suitable green taxonomy, adoption of technology, R&D initiatives by governments, developing indigenous renewable supply chains, and addressing variations in solar and wind energy supplies.
- **Monetary:** Use of CBDCs to lower carbon footprints, and lower margin requirements for Sovereign Green Bonds when used as collateral.

GREEN TRANSITION: WHAT'S THE COST?

According to a Reserve Bank of India's report on climate change, "cumulative total expenditure for adapting to climate change in India is estimated to be 85.6 lakh crore" by 2030. But a greener and cleaner economy for the future comes with a cost – a shrinking GDP like India experienced during the initial pandemic years.
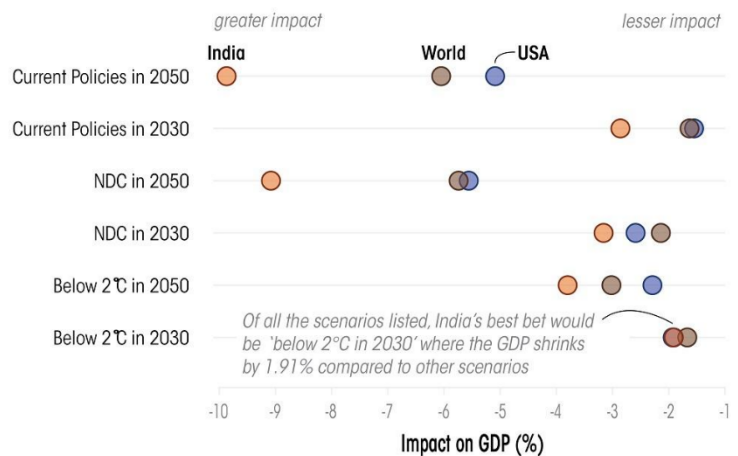
Source: Reserve Bank of India

Down To Earth

How does a developing country mitigate climate change?

- According to the **Global Climate Risk Index 2021**, India is one of the most-future-risk-prone countries in the world, ranked seventh in terms of its exposure and vulnerability to climate risk events.
- The RBI Report has suggested that sector-specific climate mitigation activities can address the climate crisis to an extent.
- India's carbon dioxide emission levels are expected to rise from 2.7 gigatonnes in 2021 to 3.9 gigatonnes by 2030 in the absence of any policy action.
- To avoid such a situation it must be ensured that **renewable energy, electric vehicles, and energy-efficient appliances**

should meet 55% of the nation's energy requirements in the future.
- A combination of renewable energy and processes such as efficient carbon pricing mechanisms or transferring responsibilities to producers can be implemented in order to meet the remaining 45%, especially in hard-to-abate sectors such as heavy industries, animal husbandry, and agriculture.

Performance of India in climate adaptation
- According to the **Climate Change Performance Index 2023, India is the highest-performing nation in the G20 and the 5th best performer globally in terms of policy.**
- The **Niti Ayog's State Energy and Climate Index** conducted by the Niti Ayog assesses the performance of states on the climate change and energy fronts.
- The state-wise performance analysis has revealed that Chhattisgarh, Jharkhand, and Madhya Pradesh are among the worst performers among the larger states.
- Gujarat, followed by Punjab is the highest performer on the Index on account of the performance of its electricity distribution companies on parameters such as infrastructure and financial position.
- Among the smaller states and Union Territories, Chandigarh, Goa, and Delhi were the best performers while Lakshadweep and Arunachal Pradesh were among the worst performers.

State Energy and Climate Index
- The State Energy and Climate Index was launched by the Niti Ayog in 2022 and is the first index that tracks the performance of the states and UTs in the climate and energy sector.

Objective:
o The Index aims to rank the States on the basis of their efforts to improve energy access and consumption, energy efficiency, and safeguarding the environment.
o It aims to help further the agenda of affordable, accessible, efficient, and clean energy transition for the states.
o It also encourages competition among the states.
- **Parameters:** Performance of Discoms; Access, Affordability and Reliability Of Energy; Clean Energy Initiatives; Energy Efficiency; Environmental Sustainability, and New Initiatives.
- The States and UTs have been classified as front-runners, achievers, and aspirants on the basis of SECI scores.
- Front runners are the top one-third of states with SECI scores greater than or equal to 46, the achievers are the middle two-thirds of states with SECI scores between 36 and 46, and the aspirants are the lowest one-third with scores less than 36.
- Gujarat, Kerala, and Punjab are the three top performers among the larger states while Goa, Tripura, and Manipur are the top performers among the smaller states, and Chandigarh, Delhi, Dadra and Nagar Haveli and Daman and Diu among the UTs.

Will The Greenback Still Be Green & Dedollarization

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Indian Economy
Prepp Mains Booster: Indian Economy, Effects of liberalization on the economy

Context:
- The **U.S. dollar emerged as the global reserve currency in the 20th Century** when Britain lost its status as an economic superpower and has remained the popular currency despite efforts to replace it due to concerns about attempts to weaponize the dollar.
o As China, India, and Russia dabble in trade using partner currencies for payment instead of the U.S. dollar, there is **speculation about the demise of the dollar as world reserve currency.**

What is Greenback?
- **'Greenback' is a colloquial term for a United States dollar** bill that has a green color. The term has been in use since the mid-19th century when the U.S. government began issuing paper currency that was not backed by gold or silver reserves, but rather by the "full faith and credit" of the government.
- During the American Civil War, the U.S. government issued paper money to finance the war effort, and these notes were commonly referred to as "greenbacks" due to their distinctive green color.
o Since then, the term "greenback" has come to be used more generally to refer to any U.S. dollar bill.
- Today, U.S. dollar bills are printed with green ink on the back and black ink on the front, and are used as a medium of exchange in the United States and in many other countries around the world.
- Traders in the foreign currency market refer to the United States Dollar as the greenback. As a result, it denotes trading in the United States Dollar or the US dollar index.

Rise of dollar
- The U.S. dollar became the official reserve currency of the world in 1944. The decision was made by a delegation from 44 Allied countries called the Bretton Woods Agreement.
- The US dollar's role as a favored currency for worldwide commerce and a reserve currency is not the consequence of any deliberate policy or international agreement.
- The growth of the dollar as the international currency coincides with the rise of the United States as one of the world's greatest economies, with a deep financial system and a stable government.
- From the Great Britain Pound through the introduction of the euro as the currency of the European Union, the dollar's standing has been called into question on several

occasions. The dollar, on the other hand, appears to maintain its dominance indefinitely.

Status of the US Dollar

- The dollar is still the world's reserve currency today. According to the International Monetary Fund (IMF), central banks maintain around 59% of their reserves in US dollars.
- Many of the reserves are in cash or US bonds, such as US Treasuries. Dollar-denominated debt outside the United States continues to climb, with levels reaching $13.4 trillion by mid-2022.

Share in foreign exchange reserve

- According to International Monetary Fund statistics, the dollar's proportion in foreign exchange reserves has declined over time, from 80% in the 1970s to around 60% in 2022. The euro has filled around 20% of the remaining 40% space generated by this collapse.
- Smaller currencies such as the Australian and Canadian dollars, Swedish krona, and South Korean won have taken their part of the remaining 20% gap, with Chinese yuan accounting for the remainder.

Demand of Dollar

- **Dollar-denominated assets:** Along with general acceptability as a medium of exchange for international trade, the U.S. dollar is also in demand because of demand for dollar-denominated assets worldwide.
- The debt issued by the U.S. government is bought by many countries across the world as a hedge against currency fluctuations affecting valuation of reserves. U.S. government debt and other dollar-denominated assets also serve as a quality collateral in international transactions.
- **Dollars reside outside the U.S:** Many currencies are pegged to the U.S. dollar and a few countries use the dollar as their own currency. This has meant that a huge proportion of U.S. dollars reside outside the U.S. China itself has substantial U.S. dollar reserves earned from its trade with the U.S. over the past three decades. China has used these dollar reserves to fund its strategic investments abroad.
- **Issued at low interest rate:** Being a supplier of international reserve currency confers a distinct advantage on the

government issuing it — the ability to borrow at a low interest rate.
- o As U.S. government debt is in high demand worldwide, it gets issued at the lowest interest rate.
- o This relaxes the fiscal constraint substantially, boosting the debt-issuing government's capacity to borrow more without having to deal with the negative effects of such borrowing on the domestic economy.

Why does China not feature as a prominent choice?

- China has a closed capital account, which explains why it is still not a popular place to keep reserves.
- Russia has the majority of Renminbi reserves held outside of China.
- In reality, both of these countries acquire the currency of the other as foreign exchange reserves.
- Despite the fact that Russia is India's largest oil supplier, followed by Saudi Arabia and Iraq, its largest trading partner remains the United States, according to current data.
- Russia's prominence as an oil supplier stems from the large discounts granted by its oil suppliers to Indian refiners. Such discounts will not be sustainable in the long run. This calls into question the long-term feasibility of a shared currency or reciprocal trading arrangement between China, India, and Russia, as geopolitical forces push India closer to the US.

Has India attempted de-dollarization?

- Recently, India and Russia have attempted to conduct bilateral trade in Indian Rupees rather than U.S. dollars.
- However, this attempt has struggled to succeed because the value of India's imports from Russia outweighs its exports.
- This has resulted in an excess of rupees with Russia which was unwilling to spend it on Indian goods or assets.
- This has led to Russian demands to settle bilateral trade in the U.S. dollar due to the dollar's international popularity when compared to the rupee despite Russia being a longtime ally of India and a longtime foe of the United States.
- The **Reserve Bank of India had granted permission to banks from 18 countries including Russia to open Vostro accounts** in order to settle international trade in rupees.
- Under the rupee trade mechanism, Indian importers can make payments in rupees which would be credited to the Vostro account of the corresponding bank of the other country. Indian exporters would be paid from the balances available in designated Vostro accounts.
- Surplus rupee balances in the Vostro accounts could be used to invest in government securities, as payments for projects and investments, and for export-import advanced flow management.

- However, reports stated that Russian banks had been hesitant to initiate trade in rupees over concerns of excess rupee pileup.
- **India and Russia have also routed cross-border goods trade via third parties such as the UAE, which has facilitated trade in currencies other than the rupee, rouble, or dollar.**

Challenges with Dollarisation

- **Economic Sovereignty:** Many countries think that the dollar's dominance in global commerce threatens their economic sovereignty, as it provides the US government substantial power over the global economy.
- **Currency Manipulation:** Because the dollar dominates global commerce, the US government may manipulate its currency to obtain an economic edge over other countries.
- **Risk of Financial Crisis:** The dollar's dominance in worldwide commerce raises the risk of a global financial crisis, since a crisis in the US economy can have a rippling impact on the global economy.
- **Dependence on the US:** Because global commerce is mostly conducted in dollars, nations that do a lot of business with the US may become overly reliant on the US economy.
- **Geopolitics:** Other nations want to minimize their reliance on the US dollar because it is perceived as a strategy to diminish the US influence on their economy and, in other circumstances, as a form of resistance to US supremacy.

To read about *'De-Dollarisation*: *The Race To Attain The Status Of Global Reserve Currency',* click here.

Conclusion

While the dollar may face challenges, it will still remain the primary global reserve currency in the foreseeable future, due to the lack of alternatives and the trust placed in the U.S. economy and monetary policy.

Fresh Data Rejigs Drag Down 2022-23 Export-Import Tally By $3 Billion

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Indian Economy
Prepp Mains Booster: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Context:

- Recently, India's goods trade numbers have been revised for February and March 2023 by more than $10 billion from initial estimates, and overall export-import figures for 2022-23 have been scaled down by $3 billion each.
- Revision in export figures was largely due to changes in figures of petroleum exports while revisions in core export items like jewelry and gems have been insignificant.

TOP 5 COUNTRIES OF IMPORT (IN CRORE RS)

China (790,931.82) | UAE (427,413.35) | USA (403,494.91) | Russia (374,003.31) | Saudi Arabia (337,571.87)
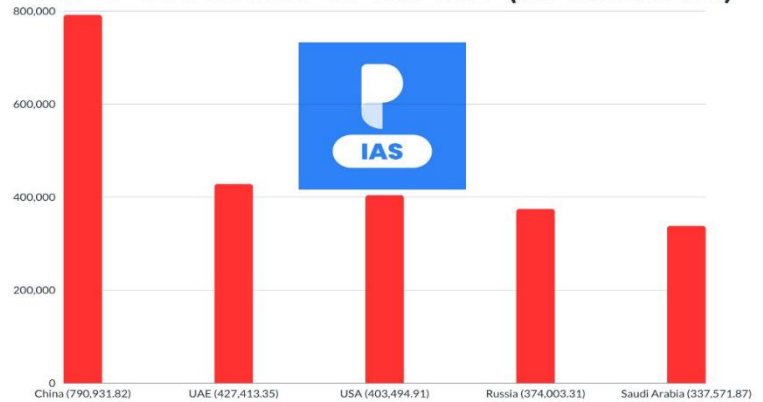
What is the latest data on trade?

- India's goods trade numbers for February and March 2023 have been revised by around $10 billion from initial estimates.
- The **overall export-import figures have been lowered by around $3 billion each, with exports flagging petroleum shipments as the primary contributor behind the high revisions of recent export data**.
- Although exports were earlier estimated to have grown 6% in 2022-23 to reach $447.46 billion, it has now been cut to $444.4 billion, which is a 5.6% rise from 2021-22 levels.
- The import bill for the previous fiscal year has been lowered to $711.85 billion from $714.24 billion, indicating growth of around 16.1%.
- The **trade deficit for the year has risen by 40.8% to $267.45 billion which is slightly higher than the 40% estimated previously.**
- The figures for goods exports for February have been revised upwards by nearly $3.1 billion to around $37 billion from the initial estimate of $33.9 billion.
- In comparison, the import bill rose $1.93 billion, which is the second-highest revision for a month since the $3.08 billion revision for December.
- In comparison, exports for the month of March have been cut by $3.03 billion from $38.38 billion to $35.35 billion meaning a sharp drop of 20.7% on a year-by-year basis meaning the value of outbound shipments was at the same level as March 2021.
- Imports for December 22-23 have been revised downward by $2.4 billion to around $55.72 billion.

What does it mean?

- According to experts, data revisions of over $500 million a month are not normal but significantly higher revisions have been seen over the last one and a half years compared to the period prior to that.
- The revisions in exports are largely dominated by the changes in petroleum export numbers.

- In comparison to petroleum exports, the exports of other core export products like gems and jewelry have been insignificant.
- The rise in India's oil imports from Russia in the aftermath of the Russia-Ukraine may have been the trigger for the fluctuations in petroleum prices.
- However, experts pointed out that the sharp revisions in petroleum export figures had begun four-five months before the Russian invasion of Ukraine.
- Experts also stated that the situation raised uncertainty on the prospects of India's **current account deficit** and the value of the rupee.
- The average monthly upward revision of the net trade deficit worth $1.5 billion could raise the annual cumulative to $ 18 billion.
- The analysis of economic data was a significant challenge given such a large revision in monthly trade deficit data.
- Expert economists also stated that there would be a greater understanding of the trigger behind the high revisions and the concentration of the revisions in the petroleum sector in recent months.

TOP 5 COUNTRIES OF EXPORT (IN CRORE RS)

Bar chart values:
- USA (630,199.19)
- UAE (253,852.60)
- NETHERLAND (174,428.20)
- CHINA (122,984.68)
- SINGAPORE (96,185.13)

Trade trends in India

- According to the Ministry of Commerce and Industry, **the export of petroleum products from India increased from $67471.70 million in 21-22 to 94524.5 million in 22-23.**
- The export of petroleum products grew by 40.1% in the April 2022 - March 2023 financial year.
- The **import of petroleum and crude products rose from $161810.45 million in 21-22 to $209573.56 million in 22-23.**
- The import of petroleum products rose by 29.52% between April 2022 and March 2023.
- In comparison, the gems and jewellery sector saw exports fall from $39099.12 million in 21-22 to $37956.87 in 22-23.
- India's largest source of imports was China with imports in 2022-23 followed by UAE, the U.S.A., Russia, and Saudi Arabia.

- India's exports in 22-23 were primarily to the U.S.A, followed by UAE, Netherlands, China, and Singapore.

Agriculture

Cabinet Gives Approval For Fertilizer Subsidy Of Rs.1.08 Lakh Crore For Kharif

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Agriculture
Prepp Mains Booster: Agriculture, Direct and indirect farm subsidies

Context:

- Recently, the **Union Cabinet approved a fertilizer subsidy of Rs 1.08 lakh crore for the Kharif season 2023-24.**
- o Out of this, **Rs. 38,000 crore will be used to subsidize phosphatic and potassium (P&K) fertilizers,** while **Rs.70,000 crore would be used to subsidize urea.**
- With fertilizer prices being high due to global reasons like a drop in output and increased logistical costs, particularly due to the Ukraine scenario, the Centre anticipates this year's fertilizer subsidy to exceed Rs.2.25 lakh crore.

Background

- Due to **Russia's invasion of Ukraine in 2022-23, fertilizer subsidies have to be dramatically boosted.**
- The government had made certain that rising global fertilizer costs did not harm India's farmers. Fertilizer prices skyrocketed last year after sanctions against Belarus, a major producer.
- o Belarus backed Russia in its conflict against Ukraine. This spurred global fertilizer companies to increase purchases and transport enormous volumes of fertilizer in order to circumvent supply chain challenges and trade restrictions in export countries such as Russia.
- Urea futures contracts increased by roughly 85% in the two weeks following the commencement of the war in Ukraine on February 24, last year.
- This was mostly due to high energy prices, notably natural gas, long before Russian forces arrived in Ukraine. The price of urea often follows that of natural gas pretty closely.
- Despite the global increase in fertilizer costs last year, the government did not raise the maximum retail price (MRP) of fertilizers, necessitating a bigger subsidy.
- According to the 2023-24 Budget, the revised estimate for the fertilizer subsidy offered in 2022-23 is 2.25 trillion.
- It was stated that the Centre's fertilizer subsidy cost for the previous fiscal year ending March was Rs.2.54 trillion.

What is Fertilizer Subsidy?

- Farmers buy fertilisers at MRPs (maximum retail price) below their normal supply-and-demand-based market rates or what it costs to produce/import them.
- A subsidy enables an individual to purchase a product or use a service at a lower cost than the market price.
- In order to assist the weaker sectors of the population, the Indian government has provided a variety of price subsidies on kerosene, cooking gas, water, power, fertiliser, and other commodities.
- Fertilizer use in India has increased dramatically since the **Green Revolution (mid-1960s).**
- To encourage and facilitate the use of fertilisers, the government has provided farmers with fertiliser subsidies.
- It has evolved into a critical component of agricultural input support.
- Some of the important types of fertilizers include:
  - Nitrogenous (Urea, Ammonium Nitrate, Ammonium Sulphate)
  - Potassic (Potassium Nitrate, Chile Saltpetre)
  - Phosphatic (Super Phosphate, Triple Phosphate)

Who receives the subsidy and how is it paid?

- **The subsidy is paid to fertiliser firms, but the ultimate beneficary is the farmer who pays MRPs** less than market-determined rates.
- Until recently, companies were paid when their bagged material was sent and received at a district's railhead point or approved godown.
- From March 2018, a new system known as **direct benefit transfer (DBT)** was implemented, in which subsidy payments to companies would occur only after actual purchases to farmers by merchants.
- Every store in India now has a point-of-sale (PoS) machine linked to the Department of Fertilisers' e-Urvarak DBT portal.
- Anyone purchasing subsidized fertilisers must provide their Aadhaar unique identifying number or Kisan Credit Card number.

- The quantities of individual fertilisers purchased, as well as the buyer's name and biometric authentication, must be recorded on the PoS device.
- Only once a sale is registered on the e-Urvarak platform can a company claim a subsidy, which is processed weekly and paid electronically to its bank account.

Balancing act

Fertilizer prices skyrocketed last year after sanctions against Belarus, a major producer.

Fertilizer subsidy (in ₹ trillion)
- Budget estimates
- Revised estimates
- Actuals

Source: Union Budget papers for various years
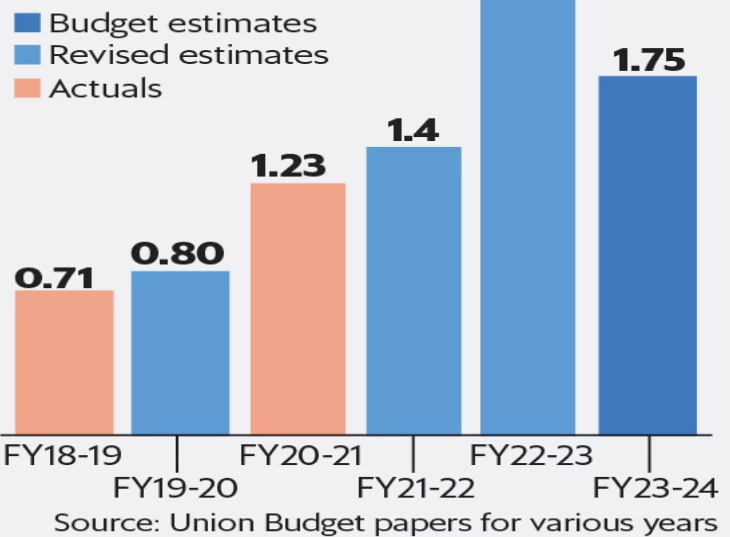
Urea and Diammonium Phosphate (DAP) Rates

- The Centre ensured that the prices of urea and diammonium phosphate (DAP) would remain unchanged during the season.
  - At present, the **subsidized rate of urea is ₹276 per bag** and the **price of DAP is ₹1,350 per bag.** The decision will benefit about 12 crore farmers.
- The total consumption of urea in the country is about 325 to 350 lakh metric tonnes (LMT).
- Apart from this, 100 to 125 LMT of DAP; 100 to 125 LMT of NPK; and 50 to 60 LMT of Muriate of Potash (MoP) are also sold in the country.
- It was stated that farmers should get fertilizers on time and hence should not be burdened at a time when international prices are high.

About Kharif Season
- Kharif season refers to the period of agricultural activity during the summer monsoon.
- The Kharif crops are often called monsoon crops because they are usually sown in the months of June-October.
- The monsoon months are regarded as ideal for seeding since the crops need a warm, humid temperature for germination.

- As monsoon arrives at a different time in the different states of the country, the exact months vary from state to state.
- During this season, crops such as rice, maize, cotton, soybeans, and sugarcane are sown and harvested. The availability of rainfall during the monsoon is crucial for the success of Kharif crops.

What are the initiatives for fertilizer subsidy?

- **Neem Coating of Urea:** The Department of Fertilizers (DoF) has mandated that all domestic manufacturers produce 100% urea as Neem Coated Urea (NCU).
- **New Urea Policy (NUP) 2015:** The policy's objectives are to maximize indigenous urea production and enhance energy efficiency in urea units. It also aims to reduce the government of India's subsidy load.
- **Policy on Promotion of City Compost:** Approved a policy on promotion of city compost, issued by the Department of Fertilizers (DoF) in 2016, awarding Market Development Assistance of Rs.1500/- for scaling up production and consumption of city compost.
- **Use of Space Technology in the Fertilizer Sector:** The Department of Fertilizers (DoF) commissioned a three-year Pilot Study on "Resource Mapping of Rock Phosphate Using Reflectance Spectroscopy and Earth Observations Data" by ISRO's National Remote Sensing Centre, in collaboration with the Geological Survey of India (GSI) and the Atomic Mineral Directorate (AMD).

Here Is How Producer Organisations Evolved In India

Priority: Medium

Primary Source: Down to Earth

Prepp Prelims Booster: FPOs

Prepp Mains Booster: Transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers. Issues related to direct and indirect farm subsidies and minimum support prices;

Context:

- The concept of Farmer Producer Organizations was developed by India in the early 2000s to help small farmers gain economies of scale and improve market standing by negotiating collectively.
- The Union government launched the Formation and Promotion of 10,000 Farmer Produce Organisations Scheme to form and promote 10,000 new FPOs in the country by 2024 with budgetary support of ₹6,8656 crores.
- As per the Union Ministry of Corporate Affairs, there are 16,000 FPOs in India as of February 2023.

What is the Formation and Promotion of 10,000 Farmer Produce Organisations Scheme?

- The concept of the **Farmer Producer Organizations** was developed in the early part of the 2000s in order to help Indian farmers improve their market standing through collective negotiations and build economies of scale.
- FPOs can be registered companies i.e. **Farmer Producer Companies (FPC) or cooperatives.**
- The **Formation and Promotion of 10,000 Farmer Produce Organizations Scheme was launched in 2019** by the Government of India with the aim of forming and promoting 10,000 new FPOs in India by 2024.
- The scheme had a budgetary provision of ₹6,865 crores.
- Under the Scheme, the formation and promotion of FPOs is to be done through nine implementing agencies including the **Small Farmers Agri-Business Consortium (SFAC), National Cooperative Development Corporation (NCDC), and National Bank for Agriculture and Rural Development (NABARD).**
- The implementing agencies will engage **cluster-based business organizations or CBBOs** to aggregate, register and provide professional hand-holding to FPOs for a five-year period.
- The CBBOs, which will act as platforms for end-to-end knowledge for all issues related to FPO promotion, have been empanelled and engaged by implementing agencies.
- **Eligibility criteria:**
  - Any **legal entity registered in India and in existence for more than three years is eligible to be a CBBO.**
  - The agency should have a **minimum average turnover/utilization of funds of at least ₹2 crores for the plains and ₹3crores for the Himalayas and northeastern region during the past three years with a positive net worth.**
  - However, institutions promoted by public sector agricultural universities, ICAR or Krishi Vikas Kendras, or similar institutions of Central/state governments are exempted from this requirement.
- The **implementation agencies pay CBBOs ₹25 lakhs per FPO for a five-year period for costs incurred** during the formation and promotion of the FPO.
- In order to be eligible for the scheme, CBBOs have to form FPOs with a **minimum size of 300 farmer-members in the plains and 100 farmer-members in the hilly regions and Northeast.**

What are FPOs?

- **Farmer Producer Organizations or FPOs are not-for-profit organizations governed by farmer-members who actively participate in decision-making and policy-making.**
- They are based on the idea that farmers can form groups and register under the Indian Companies Act, thereby contributing to the improvement of producer incomes.
- Membership is open to anyone who can use their services and is willing to accept the responsibilities of membership, regardless of gender, social, racial, political, or religious affiliation.
- FPO educate and train farmer members, elected representatives, managers, and employees in a way that enables them to contribute effectively to the development of their FPOs.
- **The goal of FPOs is to enable farmers to be competitive and take advantage of emerging market opportunities.**
- FPO activities include seed, equipment and fertilizer supply, market linkages, training and networking support, and financial and technical advice.

How are FPOs formed under the scheme?

- The process of FPO formation begins with the **identification of a produce cluster area,** which is a contiguous or compact geographical area with similar agricultural produce, and a feasibility study by the CBBO.
- The CBBO then **mobilizes potential producers and shares the business idea, viability, market size, and other risks** with them.
- The business plan is prepared to cover the entire end-to-end value chain including sectors such as production, post-production, marketing, value addition, and exports.
- The Union Government has mandated the **SFAC, which is an autonomous registered society promoted by the Ministry of Agriculture to facilitate and support State Governments in the formation and promotion of FPOs**.

FPOs in India

- As per the SFAC, in June 2022 there were around 535 FPOs registered under the scheme with nearly 55 CBBOs functioning as consulting agencies.
- The CBBOs include large corporations such as Grant Thornton Bharat LLP, PricewaterhouseCoopers Pvt Ltd, Isha Outreach, and large-scale agribusinesses such as ITC Ltd and Star Agriwarehousing.
- **According to the Union Ministry of Corporate Affairs, there are 16,000 FPOs as of February 2023.**
- The last three years 2020-21, 2021-22, and 2022-23 have seen the largest increase in the registration of FPOs, with around 65% of FPOs registered in this period.
- In 2020-21, around 6000 FPOs were registered despite the country suffering an unprecedented pandemic that forced the shutdown of many private enterprises and economic distress to the country's agrarian population.

To know more about FPOs, click the link.

Science and Technology

A Boost For Science, A Wider Window To The Universe

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Science and technology
Prepp Mains Booster: Science and Technology

Context:

- In this article, written by Sethuraman Panchanathan, Director, United States National Science Foundation has discussed the **Laser Interferometer Gravitational-wave Observatory (LIGO)** experiment and the benefits of collaboration with like-minded countries.
  - **The Union Cabinet has recently approved the establishment of a gravitational-wave detection facility in Maharashtra** that will include a detector known as the Laser Interferometer Gravitational-wave Observatory (LIGO).
  - The project is a **collaboration between a consortium of Indian research institutions and the US observatories with several other international partners.**

Background

- In 2015, the Laser Interferometer Gravitational-Wave Observatory (LIGO for short) observed this phenomenon for the first time, expanding our understanding of the universe around us.
- Now, the United States National Science Foundation is partnering with top U.S. universities and India's Raja Ramanna Centre for Advanced Technology, or RRCAT (a unit of Department of Atomic Energy, Government of India) to launch LIGO-India, a ground-breaking collaboration, fuelled by a $320 million investment from India, that will accelerate discovery and innovation in India and around the world.

- Albert Einstein's 1916 general theory of relativity first predicted the phenomenon of gravitational waves. But it took physicists another century to prove Einstein right by observing them directly.

LIGO – A GIGANTIC INTERFEROMETER
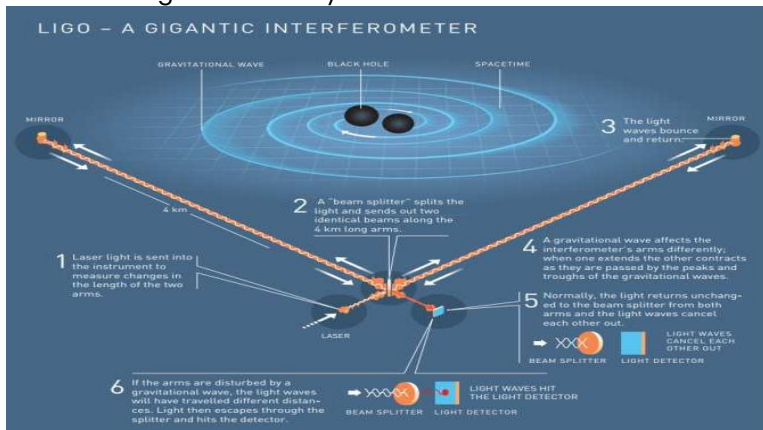
About LIGO

- **Laser Interferometer Gravitational-wave Observatories (LIGO)** is the world's largest gravitational wave observatory, a scientific collaboration and marvel of engineering that consists of two facilities in the United States, one in the Pacific Northwest at Hanford, Washington, and another near the Gulf of Mexico in Livingston, Louisiana.
- LIGO uses lasers to detect ripples in space-time through a method called interferometry: as gravitational waves pass by, they cause space itself to stretch and squeeze, which scientists can measure through changes in the beams of the LIGO lasers.
- LIGO has provided new clues about merging black holes, the existence of neutron stars and the origin of the universe.

How does LIGO work?

- LIGO is made up of two 4-kilometer-long vacuum chambers that are set up at right angles to one another, with mirrors at the ends.
- When light rays are discharged in both chambers at the same time, they should return at the same time.
- When a gravitational wave arrives, one chamber expands while the other contracts, causing a phase difference in the returning light rays.
  o The presence of a gravitational wave is confirmed by the detection of this phase difference.

About LIGO-India Project

- LIGO India is a planned advanced gravitational-wave observatory to be located in India as part of the worldwide network.
- The LIGO project operates three gravitational-wave (GW) detectors. Two are at Hanford in the State of Washington, north-western USA, and one is at Livingston in Louisiana, south-eastern USA.
- The LIGO-India project is an international collaboration between the LIGO Laboratory and three lead institutions in the LIGO-India consortium: Institute of Plasma Research,

Gandhinagar; IUCAA, Pune; and Raja Ramanna Centre for Advanced Technology, Indore.
- It will significantly improve the sky localisation of these events. This increases the chance of observation of these distant sources using electromagnetic telescopes, which will, in turn, give us a more precise measurement of how fast the universe is expanding.
- After the detection of gravitational waves in 2016, a third detector is being built in India as part of the LIGO-India collaboration. This is to increase the detectors' combined capacity to spot gravitational wave sources in the sky.

Opportunities for India

- India could become a global site of gravitational physics research, aiding training and the handling of precision technologies and sophisticated control systems, ultimately, cementing a reputation for successfully running an experimental Big Science project.
  o The basic requirement here is the timely release of funds for construction, followed by issuing the allocated resources without delay.
- LIGO-India can demonstrate an ability to reckon intelligently with Indian society's relationship with science, using the opportunities that Big Science affords.

What are Gravitational Waves?
- Gravitational waves were initially proposed in Albert Einstein's General Theory of Relativity (1916), which explains how gravity operates.
- These waves are caused by the movement of large celestial entities, like as black holes or neutron stars, and are ripples in spacetime that propagate outward.
- Just as light emitted by an object can be used to probe its electromagnetic properties, gravitational waves can be used to prove the gravitational feature of the source.

What are the benefits of collaboration?

- LIGO-India will push the frontiers of what science and technology can achieve by joining the global network, which includes the two LIGO detectors in the United States, Virgo in Italy, and the Kamioka Gravitational-wave Detector (KAGRA) in Japan.
- The development of LIGO-India is a significant milestone for gravitational wave science and the worldwide advancement of knowledge that transcends boundaries.
- The observatory will assist to address some of the most fundamental mysteries about the universe.
- And, through collaboration with like-minded partners, it will provide current and aspiring scientists with a broader view of the universe while inspiring the next generation.

First Study On Indian Sludge Finds 'high Potential' For Use As Fertilizer

Priority: Medium

Primary Source: The Hindu
Prepp Prelims Booster: Environment
Prepp Mains Booster: Environmental pollution and degradation, environmental impact assessment.

Context:

- Recently, a study by Indian Institute of Technology (IIT)-Roorkee found that sludge found in Indian **sewage treatment plants (STP),**have **"high potential" for use as fertilizer,** but required treatment before it could be used **unrestricted in farms, or as a potential biofuel.**
  - Sludge is the thick residue filtered out of sewage treatment plants that while rich in organic chemicals is also a repository of heavy metals, industrial effluents and bacterial contaminants.
- The study is the first of its kind in India and it aims to **gather data on the chemical composition of the sludge**.

Findings of study

- **Rich in Nitrogen, phosphorus and organic carbon:** The study found that Nitrogen, phosphorous, and organic carbon levels were higher than those recommended by India's fertilizer standards (FCO, 2009). However, potassium levels of some sludges were less than recommended.
- **High degree of heavy metals and pathogens:** The degree of pathogens and heavy metal contamination was above the recommended fertilizer standards.
- **Lower calorific value:** The calorific value of sludge ranged from 1,000-3,500 kcal/kg which is lower than the average calorific value of Indian coal.
- As per the standards of the United States Environment Protection Agency treated sludge can be classified as class A or class B.
  - **Class A:** Class A slide is safe to be disposed of in the open and useful as organic fertilizer.
  - **Class B** means that the sludge can be used in **"restricted" agricultural applications**, the edible parts of the crop must **not be exposed to the sludge-mixed soil**, and animals and people not come into extensive contact.
- Most of Sludge falls in class B, that is it can be used in "**restricted" agricultural applications without exposing** edible parts of plant to **sludge-mixed soil.**

Challenges

- **Absence of standards:** India doesn't yet have standards classifying sludge as class A or B.
- **Lack of processing:** Contractors responsible for the development and maintenance of STPs under the Namami Ganga Mission are allotted land for sludge disposal.
- However, this sludge is often left untreated, leading to its release into rivers and local water sources during rainy periods.
- **Extensive treatment:** Even after the sludge is stored and blended with cattle manure and husk or local soil to reduce the heavy metal. It would still put it in class B, and converting it into grade A sludge would require far more extensive treatment.

Way forward

- The study recommended that sludge needs to be stored for at least three months to kill pathogens, and blended with cattle manure and husk or local soil to reduce the heavy metal.
- "Arth-Ganga" program will channelize economic activity along the banks of Ganga River by **boosting economic development and inclusive growth** for farmers, small traders and villagers

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Arth Ganga

- PM Modi first introduced the Arth Ganga concept during the **first National Ganga Council** meeting in Kanpur in 2019, where he urged for a shift from Namami Gange, the Union Government's flagship project to clean the Ganga, to the model of Arth Ganga.
- The central focus of the Arth Ganga is **people-river connect** that aims to firmly establish a collaborative relationship between the river and the people.
- The central idea of "Arth Ganga" is linking people and Ganga through the bridge of economics in line with the slogan of **"Banking on River Ganga".**

Under Arth Ganga, **six verticals** are being worked upon:

I. **Zero Budget Natural Farming** that includes chemical-free farming for 10 kms on either side of the river, generating "more income, per drop", 'Gobar Dhan' for farmers,

II. **Monetization and Reuse of Sludge &Wastewater** that envisages reuse of treated water for irrigation; industrial purposes and revenue generation for ULBs,

III. **Livelihood Generation Opportunities** such as 'Ghat Mein Haat', promotion of local products, Ayurveda, medicinal plants, capacity building of volunteers like Ganga Praharis,

IV. **Public Participation** to ensure increased synergies between stakeholders,

V. **Cultural Heritage &Tourism** that looks to introduce boat tourism through community jettis, promotion of yoga, adventure tourism etc. and Ganga Artis and

    VI. **Institutional Building** by enhancing the local capacities for better decentralized water governance.

What Is Transformer, The Machine Learning Model That Powers ChatGPT ?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Machine Learning

Prepp Mains Booster: Science & Technology

Context:
- In this article, Dr. Makarand Tapaswi is a senior machine learning scientist at Wadhwani AI, a non-profit on using AI for social good, and an assistant professor at the computer vision group at IIIT Hyderabad has discussed **Machine learning (ML),** a subfield of artificial intelligence.

What is Machine Learning (ML)?
- Machine learning (ML) is a branch of artificial intelligence which trains computers to perform problems based on structured data, language, voice, or pictures by providing examples of inputs and desired outputs.
- It is an application that enables a system to learn from its experiences and develop accordingly without the need for someone to directly put such changes into it.
- Machine learning allows systems and gadgets to develop without being programmed to that degree. It uses data for training in order to get reliable results.
- The basic goal of machine learning is to create computer programs that can get the necessary data and use it to learn on their own.

Types of Machine Learning
- **Supervised learning** is the most prevalent kind of machine learning. In this strategy, the computer is provided a collection of labeled data with the desired result already known. The computer then utilizes this data to train a model, which may subsequently be used to generate predictions on fresh, previously unknown data.
- **Unsupervised learning** involves dealing with unlabeled data. The computer is not provided any knowledge about the desired output and must instead discover patterns and structure in the data on its own.
- This form of learning is frequently used for tasks such as clustering, in which the computer groups related data points together, or dimensionality reduction, in which the computer discovers a lower-dimensional representation of the data.
- **Reinforcement learning** is a type of machine learning that includes training a model to make decisions or take actions in an environment in order to achieve a desired outcome.
- This form of learning is frequently utilized in activities such as robotics, where the machine must learn to navigate and interact with its surroundings.

Adoption of Transformers
- A transformer is a two-part neural network. The first component is a 'encoder,' which consumes the input sentence in the source language (e.g., English), and
- The second is a 'decoder,' which creates the translated sentence in the target language (e.g. Hindi).
- The encoder converts each word in the source sentence to an abstract numerical form that captures the meaning of the word within the context of the sentence, and stores it in a memory bank.
- Transformers have also gained popularity in computer vision: they just break a picture into little square patches and line them up like words in a text.
- By doing so, and after training on vast quantities of data, a transformer can outperform CNNs.
- Transformer models are now the best solution for picture classification, object identification and segmentation, action recognition, and a variety of other applications.
- The capacity of transformers to consume anything has been used to develop combined vision-and-language models that allow users to search for an image (e.g., Google Image Search), describe one, and even answer questions about the picture.

How is machine learning different from traditional computer programming?
- It differs from typical computer programming, in which programmers create a series of explicit instructions.
- Here, the ML model learns to provide desirable outputs by modifying its numerous knobs, which can number in the millions.
- ML has a history of inventing approaches with hand-crafted characteristics that may only work for certain, restricted issues. There are several examples of this.
- In writing, determining whether a work is scientific or literary may be accomplished by counting the number of times particular terms appear.
- In audio, spoken text is recognized by transforming the audio to a time-frequency representation.
- In images, a car can be located in photos by looking for distinctive car-like edge-shaped patterns.
- Such hand-crafted features are combined with simple, or shallow, learning classifiers that typically have up to tens of thousands of knobs. In technical parlance, these knobs are called parameters.

What is 'attention' in machine learning?

- In machine learning, attention allows a model to learn how much weight to assign to various inputs.
- In the translation example, attention allows the model to choose or weigh words from the memory bank when determining which word to create next.
- While describing an image, attention allows models to look at the important areas of the image while creating the following term.
- The capacity of attention-based models to self-discover by processing a large amount of input is remarkable.
- Transformers are attention models on steroids. They include numerous attention layers, both inside the encoder to offer relevant context throughout the input sentence or picture, and from the decoder to the encoder when creating a translated sentence or describing an image.

Applications of Machine Learning

- **Field of healthcare:** These technologies have the potential to completely transform how we identify and treat disease. Machine learning algorithms, for example, may be used to evaluate medical pictures and accurately detect illnesses such as cancer. Furthermore, virtual assistants powered by AI can support patients in managing their health by giving individualized health information and tracking their symptoms.
- **AI in finance:** These technologies may be used to evaluate enormous volumes of financial data and create predictions about market patterns and individual stock performance. This may be used to assist traders make better educated trades. This technology is also being used to detect and prevent fraud, as well as to make smarter financial decisions.
- **Natural Language Processing (NLP):** This is the use of algorithms to interpret and produce human language. NLP is being utilized in a range of applications, including chatbots and virtual assistants that can interpret and respond to human voice and text. This technology is also being used to analyze and comprehend vast amounts of text data, such as customer reviews or social media postings, in order to acquire insights and make better decisions.
- **Image and Object Recognition:** Machine learning algorithms can be trained to recognize and classify objects in images or videos, enabling applications such as facial recognition, object detection, and autonomous vehicles.
- **Fraud Detection:** Machine learning can analyze patterns and detect anomalies in large datasets, helping identify fraudulent activities in areas like credit card transactions, insurance claims, and cybersecurity.
- **Autonomous Vehicles:** Machine learning is crucial for self-driving cars and autonomous vehicles. It involves processing sensory data from cameras, radar, and lidar to make real-time decisions on navigation, object avoidance, and route planning.
- **Energy and Utilities:** Machine learning can optimize energy consumption, predict electricity demand, and improve grid stability through load forecasting and smart grid management.
- **Gaming and Entertainment:** Machine learning is used in game development for tasks like character behavior modeling, opponent AI, and realistic physics simulations.

Understanding A Human Pangenome Map

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: General Science

Prepp Mains Booster: Biotechnology; Science and Technology-developments and their applications and effects in everyday life.

Context:

- Recently, a new study published in Nature journal describes a **pangenome reference map**, built using genomes from 47 anonymous individuals (19 men and 28 women), mainly from Africa but also from the Caribbean, Americas, East Asia, and Europe.
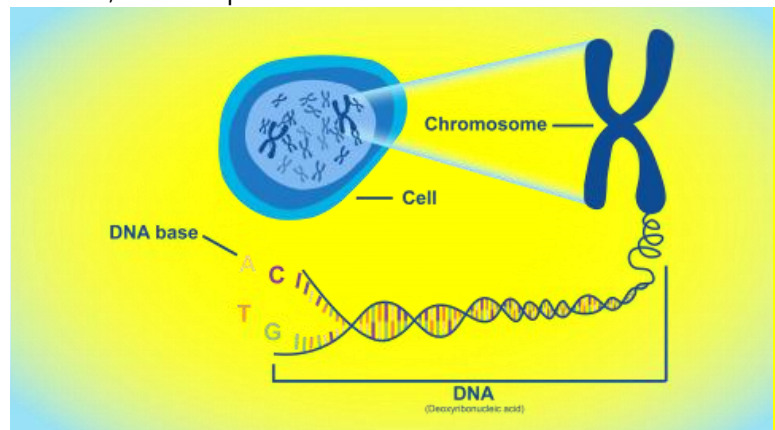
What is a pangenome map?

- A pan-genome map is a graphical representation of the pan-genome of a species. It shows the genes that are present in all strains of the species, as well as the genes that are present in some strains but not others.
- It can be used to study the **genetic diversity of a species** and to identify genes that are associated with specific traits.
- A recent study published in Nature introduced the concept of **a pangenome map, addressing this limitation.**
- The study outlines the development of the pangenome map, highlighting the genetic diversity among 47 individuals and the computational methods used to construct the map and represent variations within their genomes.
- The **pangenome is a graph**, in contrast to the older **reference genome, which is a linear sequence.**
- Each chromosome in the pangenome is depicted as a bamboo stem with nodes where sequences from all 47

individuals converge, indicating similarities. The internodes, varying in length, represent genetic variations among individuals from different ancestries.

- In the pangenome project, the researchers used **long-read DNA sequencing technologies**, which result in strings of contiguous DNA strands that are tens of thousands of nucleotides long, to generate complete and contiguous chromosome maps.
- Longer reads make it possible to construct sequences with the fewest possible errors and read through repetitive chromosomal regions that were previously difficult to sequence with short-read technology.

Why is a pangenome map important?

- Any two humans are more than 99% similar in their DNA and there is very little difference (0.4%)between any two individuals. However, human genome consists of 3.2 billion individual nucleotides and the difference between any two individuals is a 12.8 million nucleotides.
- **Understanding human diversity:** A complete and error-free human pangenome map will help us understand those **differences and explain human diversity better**.
- **Health:** It will also help us understand genetic variants in some populations, which result in underlying health conditions.
- It could help scientists unlock small genetic differences that contribute to the development of conditions like heart disease or schizophrenia, among others.
- The **pangenome reference map** has added nearly 119 million new letters to the **existing genome map** and has already **aided the discovery of 150 new genes linked to autism.**
- The new pangenome may enable researchers to **spot significant genetic variation**s that have gone unnoticed in the past due to the constraints of the previous reference sequence.
- **Precision medicine:** The project's researchers claim that it has the potential to advance personalised, precision medicine, or the creation of medical care that is customised to a person's genetic profile.

How will it help India?

- The current map lacks representation from diverse populations, including Africans, Indians, and indigenous groups in Asia and Oceania.
- Despite this, the map can still aid **in mapping Indian genomes better** against the error-free and complete reference genomes known so far.
- Future pangenome maps that include high quality genomes from Indians, including from many endogamous and isolated populations within the country, will s**hed light on disease prevalence, help discover new genes for rare diseases, design better diagnostic methods, and help discover novel drugs against those diseases.**
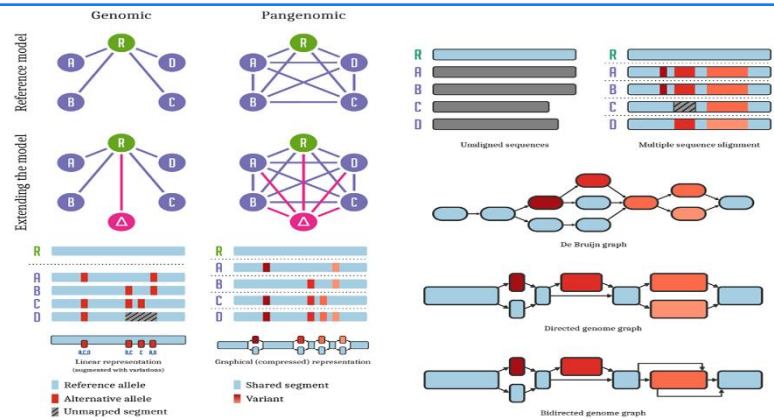
What is a genome?

- Genome refers to an **organism's complete set of DNA**, which includes **all its genes** and mapping these genes simply means finding out the location of these genes in a chromosome.
- In humans, each cell consists of **23 pairs of chromosomes** for a total of 46 chromosomes, which means that for 23 pairs of chromosomes in each cell, there are roughly 20,500 genes located on them.
- The genome is made up of 23 distinct strings, with each string consisting of millions of nucleotides or bases.
- These bases Adenine, Cytosine, Guanine, and Thymine, **represented by the four letters A, T, G, and C,** are repeated in various combinations to form the 23 chromosomes that comprise our genome.
- Genome sequencing is the method used to determine the **precise order of the four letters** and how they are arranged in chromosomes.
- Sequencing individual genomes **helps us understand human diversity** at the **genetic level** and how prone we are to certain diseases.
- Just like an Aadhaar card, the **genome is a unique identity for individuals.**
- However, sequencing the genomes of all humans is expensive and incomplete, so a collective identity card representing the genetic information of a region's population can provide broader insights without sequencing every individual's genome.

What is a reference genome?

- When genomes are newly sequenced, they are compared to **a reference map called a reference genome.**
- This helps us to understand the regions of differences between the newly sequenced genome and the reference genome.
- The creation of the first reference genome in 2001 played a crucial role in the discovery of numerous disease-associated genes, advancing our understanding of diseases like cancer at the genetic level, and facilitating the development of innovative diagnostic tests.
- The reference genome of 2001 was 92% complete and contained **many gaps and errors**. Moreover, it was **not**

representative of all human beings as it was built using mostly the genome of a single individual of **mixed African and European ancestry.**

- Since then, the reference genome map has been refined and improved to have complete end-to-end sequences of all 23 human chromosomes.
- Even though the reference genome being complete and error-free, the finished reference genome **map does not represent all of the human diversity.**

India As A QUAD-Led Biomanufacturing Hub

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Quad

Prepp Mains Booster: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment, Achievements of Indians in science & technology; indigenization of technology and developing new technology; Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

Context:
- This article published in The Hindu discusses the potential for cooperation among QUAD countries in biotechnology which remains insufficiently tapped.
- The writers have examined this proposal with researchers at the Australian National University. The establishment of a Quad-led manufacturing hub in India will give the necessary fillip to enhance this cooperation.
- India's National Biotechnology Development Strategy envisions the country as the next Global Biomanufacturing Hub by 2030 with a target of $100 billion.
- The QUAD nations - U.S.A, Australia, and Japan - possess complementary strengths that can be leveraged to help
- India create and develop such a hub.

What is Biomanufacturing?
- **Biomanufacturing uses living systems such as microorganisms and cell cultures in order to produce molecules and materials on a commercial scale.**
- According to the U.S.A.'s Centre for Disease Control and Prevention (CDC), biomanufacturing is the use of engineered biological systems outside their natural context in order to develop products.
- It includes the application of the principles of engineering and chemistry to biological systems.
- Biomanufacturing is capable of developing new approaches to existing disciplines such as gene therapy in healthcare.
- It has the **potential to transform the global industrial system, as it is projected to be able to produce up to 60% of the physical inputs to the global economy.**

- Countries such as the U.S.A. and China have recognized the need to optimize the manufacturing sector and have designed tailored policies to meet their requirements.
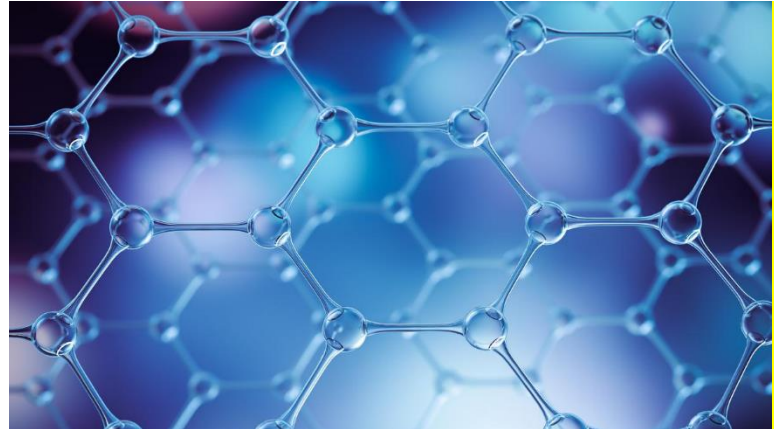
What is India's National Biotechnology Development Strategy?
- **India's National Biotechnology Development Strategy 2021-2025** has been developed by the Department of Biotechnology under the Union Ministry of Science and Technology.
- **Vision:** Harness the potential of biotechnology as a premier and precise tool for national development and society's well-being.
- **Mission: Ensure India is globally competitive in biotechnology research, innovation, translation, entrepreneurship, and industrial development and thereby make India a $150 billion Bioeconomy by 2025.**
- **Goals:**
  o Build and develop the research, innovation, and translation ecosystem across the country
  o Make India a global player in the development and deployment of new and emerging technologies
  o To build and encourage a robust start-up, industrial and entrepreneurial base in the country and develop industry-academia linkages.
  o Position India as a bio-manufacturing hub producing innovative, affordable, and accessible products for domestic society and global markets.
- **India is ranked among the top 12 countries globally and 3rd in Asia as a biotechnology destination.**
- **The sector which was valued at $63 billion in FY 2019-20 is expected to be worth $150 billion by 2025 with the number of startups growing from less than 3500 to around 10,000 by 2024-25.**
- The biotech sector in India is divided into five major segments which contribute to the bioeconomy:
  - Bio-pharma
  - Bio-services
  - Bio-agri,
  - Bio-industrial
  - Bio-informatics

- The Strategy has highlighted India's key strengths in developing biotechnology as its significant human resource capacities in science, cost-effective manufacturing, Research and academic facilities, Biotechnology parks and incubators, rich biodiversity, fast developing clinical technologies, and a well defined drugs and pharma industry.
- **Focus Areas:** The Strategy suggested India should focus on
  o Building strong links between research and academia and between research and commercialization.
  o Enhancing venture capital for high-risk science
  o Encouraging R&D expenditure by the industry
  o Quality assurance of Indian products as per global standards
  o Alignment of educational curriculum to meet industry demands
  o Developing cutting-edge research facilities and translational centers
- **Targets:** In addition to the financial objectives, the Strategy also aims to establish 125 Bioincubators, 10 Technology Clusters, 10 Biotech Parks and Manufacturing Hubs, **10 URJIT Clusters, 10 CONEs (Centres of Excellence centered on New Emerging technologies), 10 PACERs (New Partnership Centers for Research)**, **Skill Vigyan Centre in all States**, 100 Post Graduate courses, **100 Rural Bioresource Technology Clusters and 115 KISAN Hubs in Aspirational Districts.**

MARKET SIZE

44	51	63	85	150
2017	2018	2019	2023E	2025E

India Biotechnology industry valuation
(US$ billion)
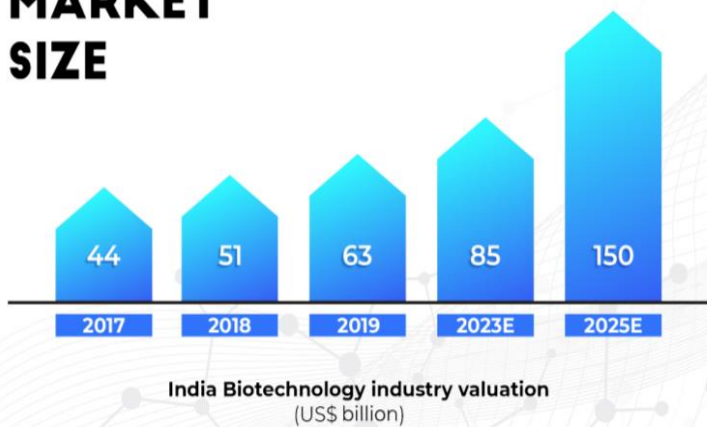
What are the advantages enjoyed by India and the QUAD in biomanufacturing?

- The strategy has set a target of a biomanufacturing industry worth $100 billion by 2025 which requires external support from the QUAD partners in order to aid its initial development.
- The **QUAD should establish a manufacturing hub in India to benefit front the country's economic potential and address supply-chain vulnerabilities.**
- QUAD countries have complementary strengths that can be leveraged to create a manufacturing hub. These include the **U.S.A.'s substantial funding capacity and the advanced biotechnology innovation ecosystems and intellectual property rights possessed by the U.S.A., Japan, and Australia.**
- In addition to the advantages provided by the QUAD, **India possesses the skilled manpower and potential to provide affordable scale.**
- India is the ideal choice to host the biomanufacturing hub on account of its **existing infrastructure, expertise in pharmaceutical manufacturing, and availability of manpower.**
- According to the Australian Strategic Policy Institute, **India is among the top performers in terms of its share in research publications and the quality of research outcomes in the field of biomanufacturing.**
- Another advantage enjoyed by India is its **potential in the area of low-cost manufacturing, especially in the production of enzymes, reagents, research materials, and equipment.**
- Analysis has found that the **cost of manufacturing in Inda is around 33% lower than that of the U.S.A.**
- However, India still requires significant investment in capability and capacity in order to transform into a world leader in biomanufacturing.
- In March 2021, a Critical and Emerging Technology Working Group was established by the QUAD to facilitate cooperation, monitor trends, and discover opportunities for development in critical and emerging technologies including biotechnology.

QUAD
- The **Quadrilateral Security Dialogue, also known as QUAD or QSD** is a grouping of four countries - U.S.A., Australia, Japan, and India.
- It was conceptualized in 2007 by former Japanese Priminstr Shinzo Abe and has been termed as an **Asian or mini-NATO**. Official talks under the QUAD took place for the first time in 2017 in Manila.
- QUAD has been termed as a counterpart to China's Belt and Road Inititative and aids in counterbalancing China in the Indo-Pacific Region.
- QUAD, which is seen as a grouping of maritime democracies that conduct regular summits, meetings, information exchanges and military exercises.
- **Principles:**
  o Preemept and reduce Chinese influence
  o Contain a 'rising China' and work against its predatory trade and economic policies.
  o Secure a global rules-based order, a liberal trading system and ensure freedom of navigation.
  o Offer alternative debt financing for Indo-Pacific nations.
  o The QUAD countries participate in the annual **Malabar Exercise**, whose latest edition was held in Japan in November 2022.

The Chinese Threat

- India plans to become a biomanufacturing hub with plans to increase fermentation capacity tenfold to ten million liters in the upcoming three-five years.
- China has expressed interest in capturing the market similar to how it has dominated the Activate Pharmaceutical Ingredients (API) sector.
- **China's dominance over the API sector has compelled India to launch a production-linked incentive scheme that has allocated $2 billion to the pharma sector to manufacture APIs, biopharmaceuticals, key starting materials, and other related products.**
- India and the QUAD could be severely impacted by Chinese domination of the biomanufacturing sector.
- The proposed biomanufacturing hub can facilitate the technology transfer, connect investors, and establish a biomanufacturing fund that is administered by the QUAD and support India's efforts to reduce dependence on China.

Way forward
- In order to scale up India's biomanufacturing sector, the country must develop the quality of its workforce.
- Although India has a surplus of life science professionals, they lack access to state-of-the-art technology. This can be addressed by **establishing permanent training facilities in universities in the QUAD with training provided by experts from other QUAD countries.**
- Recent changes made to India to allow the **establishment of foreign universities can encourage scholar exchange programmes.**
- Training should focus on **commercializing research and development**, which is a challenge faced by most non-QUAD nations.
- In order to **facilitate cross-QUAD collaboration, the manufacturing hub can host all the current bilateral government initiatives and establish research collaboration.**
- The hub can also **harmonize language, regulations, and data-sharing related to biomanufacturing so that supply chains for QUAD nations are secure and facilitate global collaboration.**
- Streamlining of research and industry will boost collaboration efforts within the QUAD and generate new opportunities for collaboration with non-QUAD nations as well.
- India can capitalize on the economic potential of the biomanufacturing industry and address existing and potential vulnerabilities in the international system through the proposed hub.

Conclusion
- The potential for QUAD cooperation in biotechnology has not yet been sufficiently explored and it is expected that the establishment of a QUAD biomanufacturing hub in India will boost cooperation in the sector.

- As a result, India can emerge as a leading player in the biomanufacturing sector and thereby allow the QUAD-nations to compete with China in this key area.

Andy Warhol case: Could A Photography Dispute In The U.S. Affect ChatGPT And Its Cousins?

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Artificial Intelligence
Prepp Mains Booster: Science and Technology- developments and their applications and effects in everyday life; Effect of policies and politics of developed and developing countries on India's interests

Context:
- The article titled "Could A Photography Dispute In The U.S. Affect ChatGPT And Its Cousins?" published in the Hindu on 25th May 2023 has discussed the implications of a recent U.S. Supreme Court verdict on copyrights on the use of generative tools like ChatGPT.
- In the Andy Warhol Foundation for the Visual Arts Inc. v. Goldsmith et al., the Supreme Court held that it was not fair use if the secondary and original works had similar purposes and the secondary purpose was commercial in nature.
- Copyright laws enable the protection of the work of artists like photographers and provide them with a set of exclusive rights over their creative output.

Copyright laws
- **Copyright laws allow for control over the manner in which the work of artists is reproduced or modified by others.**
- However, these exclusive rights have to be balanced with the rights of the users of such work which includes other artists who want to develop or comment on the work of other artists.
- The diverse set of exceptions available under copyright law helps in achieving this balance.
- The **World Intellectual Property Organization** is a specialized agency of the UN that discusses matters related to intellectual property and copyrights. India joined the WIPO in 1975.
- In India, copyrights are governed by the Copyright Act, 1957 and the Copyright Rules.

What is exempt from infringement liability?
- Different approaches are followed by different jurisdictions. While some countries in Western Europe follow the enumerated exceptions approach, other countries like the U.S.A. follow an open-ended approach.
- **Enumerated exclusions approach:** Here the use which has been challenged must be explicitly covered under the statute for it to be considered an exception to infringement.

- **Open-ended approach:** Here no exemptions are mentioned beforehand but guidelines mention the types of uses that can be exempted.
- Four factors are primarily considered by U.S. courts when determining if a particular use of a work can be considered fair use. These include:
  o **purpose and character of the use;**
  o **nature of the copyrighted work**
  o **amount and substantiality of the portion used by the defendant**
  o **effect of the use on the potential market of the plaintiff's work**
- Courts in the U.S. have been prioritizing the factors related to the purpose and character of the use.
- The question of whether the use of the work is transformative has played a critical role in determining if it is fair use of a work or not.
- The adoption of the open-ended approach to exceptions enables U.S. copyright law with flexibility and the ability to deal with challenges posed by emerging technologies on the copyright system.
- However, **it is limited in the sense that it is not possible to know if an activity will be exempted from liabilities until after the legal process in courts, making ex-ante predictions difficult.**
- According to experts, the recent verdict of the U.S. Supreme Court in the Andy Warhol Foundation for the Visual Arts Inc. v. Goldsmith et al has added to the unpredictability of the process which could impact the regulation of artificial intelligence tools.

What is the Andy Warhol case?
- One of the photos of the famous musician Prince taken by Lyn Goldsmith was licensed to Vanity Fair in 1984 under specific conditions over its use. The license specified that it could be used once as a full-page element and once as a quarter-page element.
- Celebrated artist Andy Warhol was then hired by the magazine to develop a silk-screen portrait of Prince using the photo, which later appeared in the magazine.
- When the publishers of Vanity Fair, Condé Nast approached the Andy Warhol Foundation (AWF) to reuse the illustration in 2016, they discovered that Warhol had also created 13 screen prints and 2 pencil sketches.
- They opted to use one of the newly discovered sketches and under the provisions paid the AWF $10,000 while Goldsmith was not compensated.
- In anticipation of a copyright infringement suit to be filed by Goldsmith, the AWF filed a suit for declaratory judgment of non-infringement following which Goldsmith counter-filed for infringement.
- A **district court ruled in favor of the AWF and opined that Warhol's use of the photo amounted to fair use on the**

basis that it was transformative and gave the original work a new character, expression, and distinct creative and communicative results.
- The court verdict also held that Warhol's work produced a new work of art and any restrictions on the distribution of the work would deprive people of the experience.
- The **Court of Appeals for the Second Circuit however reversed these findings and stated that Warhol's use of the photo was not fair use.**
- The Supreme Court concluded in a majority that both the photo and Warhol's illustration served a similar purpose to portray Prince.
- **Even if the reproduction contributed new meaning to the work, it is not sufficient under the first factor (the purpose and character of the work) to be considered fair use.**
- The **dissenting opinion on the bench claimed that art is not produced in a vacuum and that there is a need for a broader interpretation of the concept of 'transformative use' in relation to arts and science.**
- The dissenters further added that Warhol's work provided significant new meaning and expression which indicated that the work could be considered free use.

How does the verdict affect generative AI?
- According to experts, the verdict could have ripple effects across the visual arts.
- The majority ruling could challenge the principles on which **generative AI tools** like **ChatGPT4, Midjourney, and Stable Diffusion** were developed and now operate.
- These AI tools are trained by developers on text, images, and videos from the internet regardless of their copyright.
- As a result, courts are now more likely to rule against someone using AI tools to develop pictures in the style of famous artists like Warhol if they are similar to the original work of the artist.
- The newly generated work would not be considered fair use of the original work on the basis that the copyrighted work

and the output produced by the models serve a similar purpose.

- The focus of the majority on the commercial nature of the work may result in a deviation from the standard view in which the work's commercial nature alone does not negate a finding of fair use.
- However, the true extent of the judgment's impact will only be evident once courts begin to apply the principles observed by the U.S. Supreme Court.

What does Indian copyright law say?

- According to experts, India will not be significantly affected as India follows a different approach to the model of exceptions in comparison to the U.S. model.
- India follows a hybrid model of exceptions.
- **Hybrid model:** In this model, fair dealings with copyrighted work are exempted for certain specific purposes as per the provisions of **Section 52(1) (a) of the Copyright Act, 1957.**
- India has enumerated a list of specific exemptions which are considered valid fair uses under the law.
- It is however possible that the verdict of the U.S. Supreme Court could have a persuasive effect on other jurisdictions, including India, particularly in relation to determining the fairness in a fair-dealing litigation.

Conclusion

- The majority and minority verdicts of the U.S. Supreme Court on copyright laws could affect the models adopted by other nations and lead to other judiciaries treating AI-generated outputs as copyright infringements.

Environment

Global Warming: Why India Is Heating Up Slower Than The World Average

Priority: Medium

Primary Source: Indian Express

Prepp Prelims Booster: Environment

Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment, Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes

Context:

- The annual mean temperature of the world is known to have increased by 1.1°C compared to the average temperature in the 1850-1900 period.
- An assessment of climate change over the Indian subcontinent published by the Ministry of Earth Sciences in 2020 stated that annual mean temperatures had risen by 0.7°C from 1900.

- The lower rise in temperature over India is influenced by factors such as tropical location, the presence of aerosols, and the differential warming of land and sea.

Global warming trends

- The **annual mean temperatures of the world have increased by 1.1°C from the average temperature in the period between 1850-1900**.
- However, this increase is not uniform and varies across different regions and times of the year.
- Such a single number denoting the extent of climate change is useful for communicating the dangers associated with climate change but is based on several layers of averages.
- **According to the latest report by the International Panel on Climate Change (IPCC), the annual mean temperatures over land have risen by over 1.59°C since pre-industrial times while temperatures over the oceans have increased by 0.88°C.**
- Warming trends over India were much different than the global trends reported.
- **An assessment of climate change published by the Ministry of Earth Sciences in 2020 revealed that the annual mean temperatures had risen by 0.7°C from 1900, which is much lower than the 1.59°C rise in temperature over land across the world.**
- This results in a partly inaccurate image that climate change over India was not as acute as in other parts of the world.

Why is the warming over India lower?

- India is not an exception as the relatively lower temperature rises over the country are not surprising.
- **Rise in temperatures are more prominent in the higher altitudes, near the polar region than in the regions close to the equator.**
- This is due to a complex set of atmospheric phenomena such as heat transfers from the tropics to the poles through prevailing systems of air circulation.
- However, India is in the tropical zone, quite close to the equator which means the rise in temperatures is not as prominent in the country.

- The average rise in the world's temperatures has been about 1.1ºC in comparison to pre-industrial times. However, this has varied across the world with regions experiencing different levels of warming.
- The polar regions, specifically the Arctic, have experienced significantly higher levels of warming.
- **According to the IPCC report, the Arctic region has warmed by at least two times the world average with current annual mean temperatures about 2ºC higher than preindustrial times** although some experts have claimed that the Arctic could actually be warming faster.
- Another reason for the lower warming is **albedo**, which refers to the portion of solar energy reflected from the Earth's surface to space.
- As a result of the melting of Arctic ice, more land and water are becoming exposed to the Sun.
- In comparison to land and water, ice traps the least amount of heat and reflects most of the solar radiation.
- According to recent research, the higher warming in the polar regions could be a result of numerous factors including the albedo effect, changes in clouds, water vapor, and atmospheric temperatures.
- Warming of the polar regions accounts for a substantial portion of the 1.1ºC rise in temperature around the world.

Higher temperatures over land

- The warming of 0.7ºC in India has to be compared with the rise in temperature over land of 1.59ºC, not the annual mean temperature rise to understand the magnitude of lower warming in India.
- **Land heats up faster and in greater magnitude than oceans. Oceans also have a greater ability to cool down through evaporation in which the warm water evaporates into vapor leaving behind cooler water in the oceans.**
- Seasonal and daily variations in heating over land and oceans are explained in terms of their difference in heating capacities.
- However, enhanced heating trends over land in the long term have to be attributed to more complicated, physical processes involving land-ocean-atmospheric interactions.

10-YEAR MOVING AVERAGE ANNUAL MEAN MINIMUM
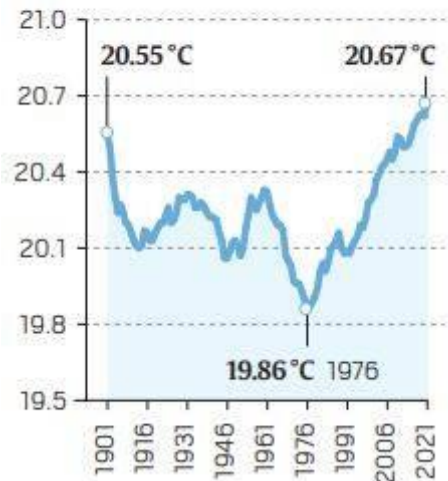
10-YEAR MOVING AVERAGE ANNUAL MEAN MAXIMUM
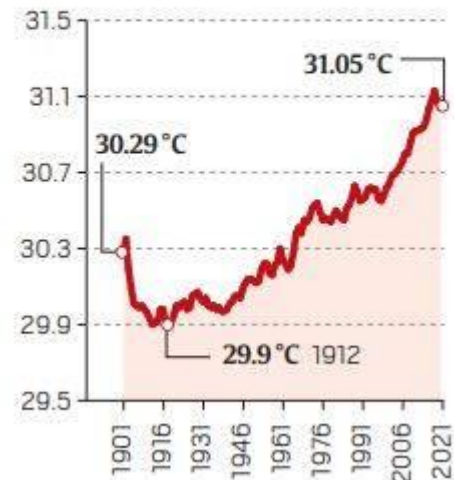
Impact of aerosols

- **Aerosols are particles of all kinds that are suspended in the atmosphere and have the potential to affect local temperatures in multiple ways.**
- These particles scatter sunlight so that lesser amounts of heat are absorbed by land.
- **Aerosols also affect cloud formation which in turn impacts the amount of sunlight absorbed or reflected.**
- The concentration of aerosols is quite high in the atmosphere over India due to natural and anthropogenic causes.
- India, whose location in the tropics and arid climate means it is prevalent to dust is also suffering from high levels of pollution.
- Emissions from vehicles, construction, industries, and other activities are the major contributors to aerosols in India.

- **One of the unintended but positive side effects of the increased aerosol concentration is the lowered levels of warming.**
- In comparison to greenhouse gases, aerosols are relatively short-lived in the atmosphere.
- Prominent aerosols found in India's atmosphere include PM2.5, PM10, dust, black carbon, etc.

Tropical location

- A significant part of India's lowered warming can be attributed to its location in the lower latitudes.
- As per Prof. Bala Govindaswamy of the Centre for Atmospheric and Oceanic Sciences at IISC Bengaluru, it is well established in science that higher latitude regions experience greater levels of warming.
- A major portion of the world's landmass is located in the northern hemisphere while the oceans and the tropical and equatorial regions are mostly oceans.
- As the **global landmass is mostly located in the Northern hemisphere and displays a tendency to heat up faster and in greater magnitude, the average warming over land has become more pronounced**.
- It is, therefore, not surprising that a country like India, which is located in the tropics, displays such a deviation from the global average in temperature rise.
- Although **aerosols have the potential to avoid 0.1 - 0.2°C of warming over India,** the extent of their impact is not clear at present.
- This leads to the tragic conclusion that the **cleaning up of India's atmosphere could lead to a rise in temperature in the region.**

How India Is Heating Up

Average divergence from mean temperature at the beginning of the last century in India, by decade (in °C)

Conclusion

- Although the maximum temperatures over India have seen a significant increase since 1900, the rise in minimum temperatures has not been much. However, the reasons behind this are not yet clear.

- The rise in annual mean temperatures across the world has been mainly attributed to the increase in maximum temperatures.
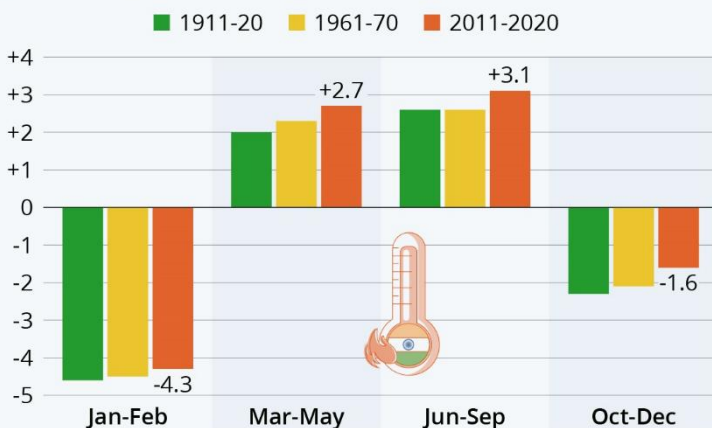- The climate system operates at a global level and modeling it on regional levels creates a number of uncertainties.

Groundwater Exploitation Is Silently Sinking The Ground Beneath India's Feet

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Environment

Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment. Disaster and disaster management.

Context:

- Various Independent studies have found land subsidence in various parts of the country similar to the Joshimath.
- According to researchers the main reason behind this is **excessive groundwater extraction.**

What is Land subsidence?

- Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to the removal or displacement of subsurface earth materials.

What Is The Reason Behind The Sinking Of Land?

- **Excessive groundwater withdrawals:** The Northwest region has a semi-arid climate and receives limited monsoon rain, so groundwater is the main source of water for irrigation.
- According to data gathered for years by the Central Ground Water Board (CGWB), the groundwater table is precariously low.
  - Central Ground Water Board (CGWB), a subsidiary body of the Jal Shakti Ministry, is tasked with assessing the state of India's groundwater resources. It has a system of groundwater observation wells and monitors water levels four times a year. It, however, does not analyze the consequences of 'over-exploitation.'
- For instance, in Punjab,76% of the groundwater blocks are 'over exploited'. In Chandigarh, it is 64%, and about 50% in Delhi. More groundwater is being extracted than it can be recharged.
- This results in underlying aquifers running dry and the layers of soil and rock above them start to sink.
- **Mining:** Mining operations that were carried out hundreds of meters below the ground for coal, oil, and gas over the years had shown examples of 'soil settlement,' or the soil sinking into voids created due to mining.
- **Urbanization and unplanned growth:** According to Kapil Malik, a research scholar who used data from the Sentinel-1 satellite shows that from 2011-2017, the **National Capital Region (NCR) sank, on average, 15 mm per year.**
- Urbanization and unplanned growth were major factors, which exacerbated groundwater withdrawal in Delhi-NCR.

- Subsidence in Delhi-NCR occurred in regions that were distant from earthquake-prone fault lines. The **absence of groundwater in the sub-surface led to sinking in certain areas**, while those with groundwater-containing aquifers showed no signs of subsidence.
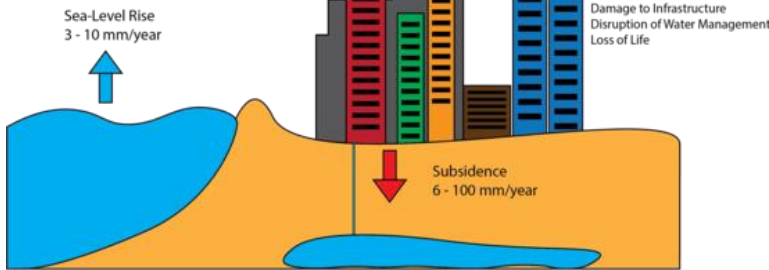
Climate Change

Accelerated sea level rise
Extreme weather events

Socio-economic Development

Urbanization and Population Growth
Increased Water Demand
Reliance on Groundwater

Sea-Level Rise
3 - 10 mm/year

Impacts

Increased Flood Risk
Damage to Infrastructure
Disruption of Water Management
Loss of Life

Subsidence
6 - 100 mm/year

Issues with Sinking Ground:
- Infrastructure damage to buildings, roads, and railways.
- Pipelines carrying oil and gas might get damaged and cause accidents.
- Intrusion of saltwater near coastal areas.
- Water supply may get disrupted.

Challenges
- **Slow and gradual process:** Unlike land movement from landslips or earthquakes, **subsidence from groundwater extraction** is **gradual and barely noticeable** on an annual basis.
- Therefore, it is more challenging to establish a direct correlation with **structural damage caused by subsidence.**
- However, data from the GRACE (Gravity Recovery and Climate Experiment) satellites could measure minute changes in gravity on different parts of the Earth's surface
- **Not specific to North India:** According to V.K. Gahlaut, chief scientist of the National Geophysical Research Institute (NGRI), the issue is not specific to North India alone.
- According to a study published in 2021 by scientists at the Indian Institute of Remote Sensing, Dehradun reported land subsidence of nearly 7-12 cm per year and groundwater extraction rates of 46 cm to 236 cm annually in Punjab and Haryana
- Instances of structural damage were noted in **Dera Bassi, Landran, Singhpura in Punjab, and Ambala in Haryana.**
- Over-exploited groundwater blocks and land subsidence has been reported in **Kolkata and parts of eastern India.**
- However, a wealth of studies in recent years, all obtained from satellite-based analysis of ground movement, from institutions and researchers that specialize in satellite-data analysis have correlated building deformities with groundwater withdrawals.

Way forward

- **Rain harvesting:** Recharging the aquifers can help improve conditions for instance Dwarka in Delhi, which saw subsidence, actually saw a reversal when aquifer levels were charged following rainwater harvesting practices that were implemented.
- **Awareness:** People should be made aware of the role of groundwater extraction.
- Structural engineers and civil engineers **should adhere to building codes** and should take care of the resulting damage due to excessive extraction of groundwater.
- Promotion of **drip water irrigation and sprinkler irrigation**.
- Promotion of **recycling and reuse** of water
- **Monitor and control extraction activities**, particularly in regions with high rates of groundwater depletion, and impose penalties for non-compliance.
- There needs to be **greater recognition t**hat groundwater exploitation has consequences other than water scarcity.

Global Warming Now More Likely To Breach 1.5°c Threshold By 2027, Scientists Warn -WMO

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Global Warming
Prepp Mains Booster: Environmental pollution and degradation, environmental impact assessment.

Context:
- Recently, the **World Meteorological Organisation** said that the 1.5 degrees Celsius temperature threshold will be breached, at least temporarily, in the next five years
- It said there was a **66 per cent chance that global temperatures** in at least one of the years between 2023 and 2027 would exceed the pre-industrial average by 1.5 degrees Celsius or more.

What did the World Meteorological Organization (WMO) say about Global Warming?
- According to a new update issued by the **World Meteorological Organization (WMO)**, Global temperatures are likely to surge to record levels in the next five years, fuelled by **heat-trapping greenhouse gases and a naturally occurring El Niño weather pattern**.
- **Warmest year:** There is a 98 percent probability that **one of these years** would be the **warmest year on record**, surpassing 2016.
- Till now, 2016 was the warmest year with an annual mean temperature being 1.28 degrees Celsius higher than the pre-industrial times (average of the 1850-1900 period).
- The year 2022 was 1.15 degrees Celsius warmer than pre-industrial average.
- The WMO assessment said that the **five-year period between 2023 and 2027 was almost certain to be warmer than** the previous five year period between 2018 and 2022.

- **Arctic warming:** Arctic warming is disproportionately high compared to the 1991-2020 average, the temperature anomaly is predicted to be more than three times as large as the global expected anomaly when considering the next five northern hemisphere extended winters.
- **Rainfall:** Predicted rain patterns for the May to September 2023-2027 average, compared to the 1991-2020 average, suggest increased rainfall in the Sahel, northern Europe, Alaska, and northern Siberia, and **reduced rainfall for this season over the Amazon and parts of Australia.**

Impact

- **Increased frequency in heat waves:** According to a recent study conducted by researchers associated with the **World Weather Attribution initiative,** the intense heat waves experienced in India and neighboring countries in April can be attributed mainly to climate change.
- The study revealed that climate change has increased the likelihood of such heat waves occurring in India, Bangladesh, Laos, and Thailand by at least 30 times.
- Previously, these events were expected to happen once a century, but due to climate change, they are now projected to occur approximately once every five years.
- The impact of the extreme events is already visible from the recent heat waves across Europe and China, drought conditions in the Horn of Africa and floods in Pakistan last year.
- **Rainfall:** Changes in temperature cause changes in rainfall. This results in more severe and frequent storms. They cause flooding and landslides, destroying homes and communities, and costing billions of dollars.
- **Health:** Climate change will impact human health resulting in increased mortality, impacting food availability, and limiting worker productivity.
- **Food security:** climate stresses are impacting the four pillars of food security (availability, access, utilisation, and stability) through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events

Conclusion

- It means the world has failed to make sufficient progress on slashing climate-warming greenhouse gas emissions and needs to work collectively before its too late.

Paris Climate Change Conference COP 21, 2015
- The Paris Agreement is a l**egally binding international treaty** on climate change.
- It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It entered into force on 4 November 2016.
- Its overarching goal is to hold **"the increase in the global average temperature to well below 2ºC above pre-industrial levels"** and pursue efforts "to limit the temperature increase to 1.5ºC above pre-industrial levels."
- To limit global warming to 1.5ºC, greenhouse gas emissions must peak before 2025 at the latest and decline 43% by 2030.
- The Paris Agreement is a landmark in the multilateral climate change process because, **for the first time, a binding agreement brings all nations together** to combat climate change and adapt to its effects.

How Does Paris Agreement Work?
- The Paris Agreement's implementation necessitates **economic and social transformations** based on the best available science.
- The Paris Agreement is based on **a five-year cycle of increasingly ambitious** climate action by countries.
- Countries must submit their climate action plans, known as **nationally determined contributions (NDCs) by 2020.**
- Countries communicate actions they **will take to reduce greenhouse gas emissions** in order to meet the Paris Agreement's goals in their NDCs.
- Countries also communicate actions they will take to build resilience in order to adapt to the effects of rising temperatures in their NDCs.

Making Cities Climate-Ready Crucial To Solving Climate Crisis: World Bank

Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: Infrastructure
Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment, Disaster and disaster management; Urbanization, their problems and their remedies

Context:

- Recently, the **Thriving: Making Cities Green, Resilient, and Inclusive in a Changing Climate** report released by the World Bank indicated that the role of cities in addressing global climate change is crucial as rapid urbanization has caused the world's population to increasingly live in cities.

- Although cities in lower-income countries account for only 14% of global urban CO2 emissions, they will face the most severe climate hazards.

What has the World Bank Report claimed?

- The World Bank Report titled **Thriving: Making Cities Green, Resilient, and Inclusive in a Changing Climate** has focused on the two-way interchange between cities and climate change.
- The report, which was released in March 2023, assessed how green, resilient, and inclusive cities are on the basis of data from over 1,000 cities.
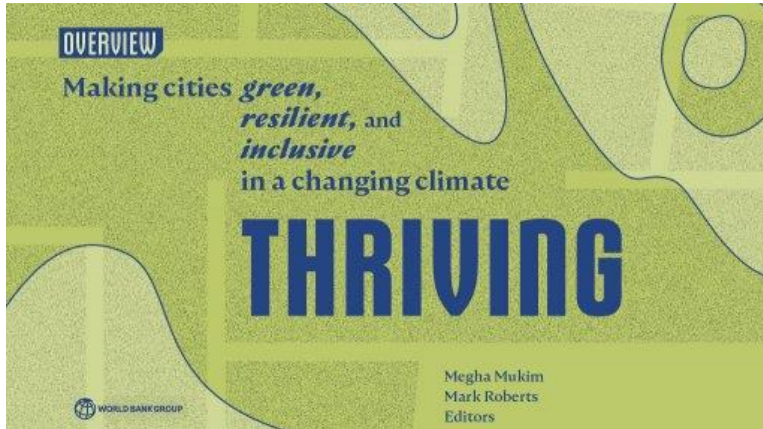
- According to the report, the **number of people inhabiting cities has increased from 1.19 billion to 4.46 billion between 1970 and 2021, which was responsible for around 70% of global greenhouse gas emissions.**
- The report also revealed that **high and middle-income countries have the highest fossil carbon dioxide emissions per capita** while low-income countries have the lowest.
- Cities in North America are the largest per capita emitters while the Sub-Saharan nations are among the lowest emitters.
- The report discovered that **medium and large cities in middle-income countries generally have high carbon emissions and pollution levels while green spaces are minimal there and less green in terms of air pollution.**
- **Cities in low-income nations were found to be at the highest risk of severe climate hazards** such as floods, heat stress, tropical cyclones, sea-level rise, water stress, and wildfires.

To know more about the impacts of climate change, click the link.

On cities and population

- According to the paper, air pollution from critical urban sectors poses a significant challenge for larger cities in counties of all economic levels.
- The report highlighted the **lack of inclusiveness** as a major reason for the lack of resilience displayed by cities in low and middle-income countries.
- It emphasized how it is critical for cities to adopt an **integrated approach involving green urban planning**

strategies that address challenges such as sustainable infrastructure and investment in green space.

- According to experts, the world's **urban population is expected to grow by 2.5 billion by 2050** which will lead to increased stress on urban water resources and infrastructure.
- As a result, the protection and restoration of critical ecosystems like forests will become a vital step in ensuring water security and urban resilience.
- The population of Sub-Saharan Africa alone is expected to grow by 950 million, reaching 1.26 billion by 2050.
- According to a recent **report by the WMO, extreme weather, climate, and water-related events resulted in 11,778 reported disasters between 1970 and 2021, causing over 2 million deaths (of which 90% were in developing nations) and economic losses worth $4.3 trillion.**

What has the report suggested?

- The report has suggested the **adoption of a different development strategy in which the present models of fragmented, disconnected, and dispersed urbanization patterns are replaced by more compact and connected models of urban development.**
- Such models were essential for climate change mitigation and poverty reduction, especially since lower-income countries are already exposed to various climate hazards including floods, cyclones, fires, and sea-level rise.
- The Report noted that cities are expanding in order to accommodate the rising number of climate refugees and other migrants.
- However, these **new settlements are informal in nature and established on the outskirts of existing cities, which means that they often lacking in terms of access to services.**
- The report also offers guidance to global policymakers related to making cities greener, more resilient, and more inclusive, thereby helping them thrive in a rapidly changing climate.
- The report also covered important areas such as information dissemination, insurance coverage, distribution of incentives, and integration and investments.
- It aims to help cities reduce their emission levels, enhance their ability to withstand climate shocks, and increase inclusivity so that the poorest sections of society are insulated from the worst effects of climate change.

Conclusion

- Cities require more **blue-green infrastructure** and smart urban design elements in place of grey infrastructure which will make cities more livable through improved management of natural resources and waste.
- A just and inclusive framework of urbanization is required to ensure equitable access to basic infrastructure.

Europe, US Lawmakers Want Oil Executive Ousted From Leading World Climate Talks

Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: International Relations
Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment, Important International institutions, agencies and fora- their structure, mandate.

Context:

- Recently, more than 100 US and European lawmakers have appealed to their country's leaders and the United Nations to remove Sultan Al Jaber, the head of the state-run Abu Dhabi National Oil Company, as the chair of the upcoming COP-28.
- The Conference of Parties is the apex body of the UNFCCC that is represented by all the UNFCCC members and meets annually unless otherwise decided by the Parties.
- The lawmakers also called on the leaders to adopt steps to limit the influence of fossil fuel companies on the COP talks.

Why have U.S. and European legislators attempted to oust the chair of COP28?

- The 28th edition of the **Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC)** is set to be hosted by the United Arab Emirates (UAE) in 2023.
- Sultan Al Jaber, the head of the state-owned Abu Dhabi National Oil Company (ADNOC) is the chair of the COP.
- According to the Guardian, the **UAE is however the country with the third biggest net-zero busting plans for oil and gas exploration**.
- The UAE's plans that would violate the net zero condition are only smaller in magnitude than those of **Saudi Arabia and Qatar.**
- The Guardian report revealed that Al Jaber is leading ADNOC's expansion strategy to produce oil and gas equivalent to 7.5 billion barrels of oil.
- **Around 90% of this expansion would have to remain in the ground i.e. unfulfilled in order to meet the Net Zero criteria established by the International Energy Agency.**
- Activists expressed fear that Al-Jaber's appointment is a threat to the global commitment to divesting **'dirty' energy** in order to limit global temperature rise to 1.5°C.
- The letter recommending the removal of Al Jaber was signed by 99 EU and 34 US legislators and was addressed to U.S President J. Biden, European Commission President Ursula von der Leyen, UN Secretary-General Antonio Guterres, and UNFCCC Executive Secretary Simon Steil.
- In January 2023, more than a dozen U.S. lawmakers approached the U.S.'s Special Climate Envoy John Kerry to apply diplomatic pressure on the UAE to replace Al Jaber.
- African climate activists like the Pan-African Climate Justice Alliance (PACJA) had equated Al Jaber's Presidency to putting the fox in charge of the henhouse which was reiterated by EU green lawmakers in February.
- The situation is a clear example of impunity and conflict of interest.

- **Climate change requires extensive cuts in the production and use of fossil fuels which is at odds with the commercial interests of ADNOC and its chairman.**

Net Zero
- Net zero is also known as carbon neutrality which refers to a state in which a country ensures that its emissions are compensated by the absorption and removal of greenhouse gases from the atmosphere.
- Net zero does not mean zero emissions.
- It includes the use of futuristic technologies to assist in carbon capture and storage.
- India has committed to achieving net zero status by 2070.

Net Zero strategy of the IEA
- The International Energy Agency has released a strategic roadmap to achieving Net-zero status by 2050.
- The roadmap aims to ensure a 38% reduction in emissions from 2021 levels by 2030.
- The roadmap also includes near-term targets, medium-term targets, and long-term targets such as universal energy access by 2030, no new ICE Car sales by 2035, and ensuring 70% of the electricity generated is from solar and wind sources by 2050.

What is the COP?
- The **Conference of Parties (COP)** is the supreme decision-making body of the UNFCCC and has the final say in all decisions of the Convention.
- It meets in Bonn, where the UNFCCC secretariat is located, unless a party offers to host it elsewhere.

President:
- The President provides acts as a leader and facilitator for negotiations conducted by the COP.
- The COP Presidency is rotated among the five regional organizations of the UN.
- The President is usually the **Environment Minister of the host country.**
- The President is chosen by acclamation at the start of the session. He has the responsibility of assisting the COP and advancing agreements between parties.
- The activities of the COP and its subsidiary bodies are monitored by an elected **Bureau** that functions between sessions as well.
- All members of the Convention are included in the COP.

Functions:
- The COP reviews the implementation of the Convention and other legal instruments adopted by it and takes decisions in order to promote the effective implementation of the Convention such as institutional and administrative arrangements.
- It also reviews the national communications and emission inventories submitted by parties.

- It also assesses the measures adopted by the parties and progress made in achieving the ultimate goals of the Convention.
- The first Conference of Parties to the UNFCCC was held in 1995 in Berlin. The 27th edition was hosted by Sharm el Shiekh, Egypt in 2022.
- In 2023, the 28th COP is expected to be hosted in Dubai between November and December 2023.

The backdrop of COP28
- COP28 will take place against the backdrop of a global energy crisis orchestrated by the Russia-Ukraine crisis and plans by industrialized and high energy-consuming countries to reopen coal plants and start new oil and gas projects, especially in Africa.
- Therefore, activists have termed **COP28 as the COP of Transition** and it would be a bad idea to have the chief of a fossil fuels-based enterprise as its President.
- This could embolden oil lobbies which are already working to derail global climate action.
- Activists called on those who care about the health of the planet and the survival of its most vulnerable people such as women and children at the forefront of the climate crisis, to resist the appointment.
- Despite decades of intense and passionate annual summits, the world continues to emit more deadly gases than ever before in history, the bulk of which come from the energy sector.
- It is evident that **global warming has worsened with extreme weather events becoming more frequent and deadly.**
- At COP27 in 2022, world leaders failed to commit to the phasing out of all fossil fuels, which was considered to be the ideal course of action to reduce emissions.

Conclusion
- According to activists and civil society organizations, COP 28 must decide to phase out coal and oil in compliance with the needs of the world.
- However, this is very unlikely with a fossil fuel executive at its head.

Therefore, the **African Group of Negotiators, the Climate Vulnerable Forum**, and allies in both the Global South and North have been encouraged to stand up against what is considered a step back in terms of global climate commitments.

Some Key Takeaways From The Petersberg Climate Dialogue
Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: Environment
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's

interests; Conservation, environmental pollution and degradation, environmental impact assessment

Context:
- Recently, the Petersberg Dialogue on Climate Change was hosted by Germany and the UAE in Berlin on the 2nd and 3rd of May 2023.
- UAE, which is also hosting COP28 of the United Nations Framework Convention on Climate Change has called on members to ramp up renewable energy capacity building.
- 2023 is the year of the Global Stocktake which is a periodic review of global climate action which aims to assess whether current efforts will be enough to achieve the goals set out under the Paris Agreement.

What is the Petersberg Dialogue?
- The **Petersberg Dialogue on Climate Change** is an annual forum for high-level political discussions focussed on international climate negotiations and actions against climate change.
- It has been **hosted by the German Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety** since 2010.
- The **2023 edition was co hosted by UAE**, which is hosting the 28th **Conference of Parties** to the **United Nations Framework Convention on Climate Change.**
- The Dialogue was attended by Ministers from 40 countries including India and the Secretary-General of the UN, Antonio Guterres.

What are the outcomes of the Dialogue?
- The UN Secretary-General highlighted the need for cleaning up economies by **breaking the over-dependence on fossil fuels and decarbonizing all sectors of the economy in order to achieve the target of keeping global warming limited to 1.5 °.**
- He also repeated calls for an **Accelerated Agenda, where all countries accelerate their commitments to achieving Net Zero.**
- The Agenda also called for a **phaseout of coal in OECD countries by 2030 and in other nations by 2040, decarbonizatio**n, and **achieving Net Zero electricity generation.**
- The German Foreign Minister claimed that in order for countries to maintain their adherence to limiting global warming to 1.5 °, they would need to sharply cut greenhouse gas emissions.
- She also suggested the development of a potential global target for renewables by the next conference similar to the targets set by the G7 for wind and solar energy.
- The Foreign Minister stated that **developed countries are on track to achieve the $100 billion per year promised to be mobilized by 2020 during COP15 in 2009.**
- Although this was good news on paper. It might be too little too late as the $100 billion is likely to be an underestimation

of the true extent of funds required for climate finance in developing nations.
- According to a recent estimate, **climate finance requirements of emerging markets alone are projected to be around $1 trillion per year by 2030.**
- As a result, climate finance requirements are more than ten times the amount developed countries have mobilized within 14 years of committing $100 billion.

- Climate finance requirements have now increased and emphasized the need for urgent financial reparations.
- The **President-Designate of COP28, Sultan Ahmed Al Jaber of the UAE suggested members enhance renewable energy capacity building and focus on phasing out fossil fuel emissions while phasing up affordable and viable zero-carbon alternatives**.
- He also recommended energy capacities by three times by 2030 and then doubled by 2040 but was hesitant to commit to the phasing out of fossil fuels.
- The Prime Minister of Barbados, who attended the meetings virtually, underlined the need for an urgent transformation of the global financial system so that the countries most vulnerable to climate change would be able to readily access finance as required.
- The Prime Minister also claimed that the **burden of maintaining global warming to within the 1.5 ° limit could not be placed only on the poorest countries which are least responsible for the accumulation of greenhouse gases in the atmosphere at the present level as the transition to energy-friendly systems is more expensive for the poorer countries.**
- It is also ethically immoral for developed countries who enjoyed the benefits of activities that contributed to global warming and greenhouse gas emissions to avoid paying the consequences.

Global Stocktake
- The **Global Stocktake, which is a period review of global climate action which aims to assess how current efforts**

will contribute towards achieving the objectives of the **Paris Agreement**, is scheduled for this year (2023).
- It is the first Global Stocktake since the Paris Agreement was signed in 2015. The report will be released in September 2023 after being prepared for the last two years.
- According to the Union Minister for Environment, Forests, and Climate Change, the outcomes of the Global Stocktake should focus on how climate change impacts actions, responses, and the development objectives of developing countries such as poverty eradication.
- He also recommended that the first **Global Stocktake should be based on the concepts of Sustainable development and Sustainable living which would influence the next round of Nationally Determined Contributions and ensure enhanced global cooperation.**

UNFCC
- The **United Nations Framework Convention on Climate Change** was signed at the Earth Summit or the United Nations Conference on Environment and Development in Rio de Janeiro in 1992.
- It entered into force in 1994 and has 197 members.
- The UNFCC Secretariat is located in Bonn, Germany.
- **Objective:**
  o Attain the stabilization of greenhouse gas concentrations in the atmosphere at a level that would avoid harmful anthropogenic interference with the climate system in a period of time sufficient for ecosystems to adjust to climate change naturally, ensure that food supply is not jeopardized, and to allow for the sustainable growth of the economy.
- **Structure:**
  o **COP:** It is the apex decision-making body of the Convention.
  o **COP President:** The President is usually the Environment Minister of the Home country and is elected by acclamation after the session is opened. The President is responsible for facilitating the work of the COP and promoting agreements between parties.
  o **COP Bureau:** The Bureau consists of elected members who guide subsidiary bodies and work between sessions as well to ensure continuity.
  o **Subsidiary bodies:** The Convention has established two permanent subsidiary bodies - the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) in order to advise the COP.
  o **Secretariat:** Known as the Climate Change Secretariat, it services the COP, Bureau, Subsidiary Bodies, and any other bodies created by the Convention to achieve specific tasks.

- The 27th edition of the COP was held in Sharm El Sheikh in Egypt in 2022 and the **28th Edition will be held in Abu Dhabi in 2023.**

Disaster Management
11 Dead After Inhaling Toxic Gas In Ludhiana

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Disaster Management
Prepp Mains Booster: Disaster and Disaster Management, Science and Technology; Issues relating to Health

Context:
- Recently, 11 people in Ludhiana died as a result of inhaling toxic gas which has been identified as hydrogen sulfide.
- The area was cordoned off and teams from the National Disaster Response Force, National Disaster Management Authority, state government officials, and the Ludhiana Municipal Corporation were deployed to ensure that there is no further contamination.

What is the situation in Ludhiana?
- Eleven people, including three children, died and four others were taken ill on inhaling toxic gas in Giaspura in Ludhiana on April 30th, 2023.
- The gas has been identified as **hydrogen sulfide** but its source is still unknown.
- According to the Deputy Commissioner, high levels of hydrogen sulfide gas have been detected in the area through the air quality sensors used by the NDRF.
- Officials claimed that the gas may have emanated from a partially open manhole and spread throughout the area.
- The autopsy reports of the victims have revealed that they died due to inhalation poisoning.
- Forensic experts have stated that acidic waste thrown into the sewer could have reacted with methane, carbon monoxide, and other sewage gases to produce hydrogen sulfide.
- Samples from the manhole have been collected and sent to the Punjab Pollution Control Board for testing.
- Although, Giaspura is an industrial region the block where the tragedy occurred did not have any industries or factories.

What was the official response to the tragedy?
- The affected area was cordoned off and teams from the **National Disaster Response Force, the National Disaster Management Authority**, and state government officials were deployed.
- Residents of the area were evacuated and drones were employed to find any unconscious victims.
- A team of officials from the Ludhiana Municipal Corporation was working to ensure that there is no further chemical contamination.

- A magisterial inquiry into the incident has been ordered and the Ludhiana city police have registered an FIR against unknown persons under **section 304 of IPC** for dumping industrial waste into sewage illegally which led to a chemical reaction and the production of the toxic gas.
- The Punjab State Government has announced a compensation of ₹2 lakhs for the families of the deceased and ₹50,000 and free medical care for those who became critically ill and are undergoing treatment.
- The Bihar Government has also announced 2 lakhs compensation for the kin of victims from the state.

Similar leaks

- In 2020, hydrogen sulfide leaked from the reactor of an industrial unit of Sainor Life Sciences in Vishakapatnam causing the death of two employees.
- A leak of styrene gas from the chemical plant of LG Polymers in Vishakapatnam killed eight people and hospitalized thousands in 2020.
- In 2015, five deaths occurred due to the leak of ammonia gas from a tanker in Ludhiana.

What are the laws related to gas leaks?

- The Indian Penal Code was the only law in effect that defined criminal liability for chemical disasters before the Bhopal gas tragedy. **Section 304 of the IPC** prescribes a maximum penalty of two years imprisonment and a fine.
- The **Environment Protection Act, 1986** gives the Central government powers to implement measures to improve the environment and set standards, and inspect industrial units
- The **Hazardous Waste(Management, Handling, and Transboundary Movement) Rules, 1989** has directed industries to identify major hazards, take preventive measures, and submit reports to relevant authorities.
- **Public Liability Insurance Act, 1991** covers insurance provided to victims of accidents that occur while handling chemicals.

- The **Chemical Accidents (Emergency, Planning, Preparedness, and Response) Rules, 1996** has directed the Centre to constitute a central crisis group for the management of a chemical and establish a quick response mechanism.
- The **National Environment Appellate Authority Act, 1997** permits the National Environment Appellate Authority to hear appeals related to the restriction of industries, operations, and processes which shall not be carried out subject to the provisions of the Environment Protection Act, 1986.
- The **National Green Tribunal, 2010** provides for the establishment of the National Green Tribunal which can dispose of cases related to the environment and forests in an expedient manner.
- **Bhopal Gas Leak Act, 1985** allowed the Union government to process claims related to the tragedy in a speedier and more equitable manner.

Hydrogen sulfide

- **Hydrogen sulfide, also known as sewer gas, is a neurotoxin** with the **distinctive odor of rotten eggs**.
- It is generally produced as a result of the microbial breakdown of organic matter in the absence of oxygen. This process is also known as **anaerobic digestion** and occurs in swamps and sewers.
- Hydrogen sulfide is also found in volcanoes, well water, and natural gas and is also produced by the human body in small amounts.
- **Properties:**
  o It is colorless, flammable, corrosive, and toxic.
  o H_2S is slightly denser than air.
  o It combusts in oxygen with a blue flame and produces sulfur dioxide and water. The mixture of H_2S and air could be explosive.
  o H_2S also acts as a reducing agent and is weakly acidic.
  o It is slightly soluble in water and oil.
  o Exposure to H_2S in large quantities can lead to organ damage and death. Other symptoms include difficulty breathing, irritation to the eyes, nose, throat, and lungs, and convulsions.
- **Applications:**
  o It is used in the production of sulfuric acid and sulfur.
  o It is used to create inorganic sulfides which are a crucial ingredient in the production of leather, dyes, pesticides, and pharmaceuticals.
  o It is also used in the production of heavy water for use at nuclear plants.

Internal Security

Manipur Riots: Kuki-Meitei Divide & Recent Unrest

Priority: Medium

Primary Source: Indian Express

Context:

- Recently, Manipur is witnessing clashes between two ethnic groups Kuki-Zomi tribals and the largely Hindu Meiteis, for the first time in three decades.
- These clashes have triggered old grievances and fuelled the aspirations and insecurities of these communities.

Recent unrest in Manipur

- **ST status:** Recent triggers for the widening divide between the Meiteis and tribals include forest eviction and demands for ST status. Kukis and Nagas point out that tribal areas are 90% of the state's geographical area, but the bulk of its budget and development work is focused on the Meitei-dominated Imphal valley.
- **Delamination Process:** In 2020, the Centre began the first delimitation process in the state since 1973, Meitei community leaders cutting across the party lines claimed that the Census figures used did not accurately reflect the population break-up, while tribal groups said though they are 40% of states population they were underrepresented in the Assembly.
- **Refugee crisis due to the coup in Myanmar:** The Meitei leaders alleged a **sudden increase in villages** in the Churachandpur district due to the refugee crisis caused by the 2021 coup in Myanmar.
- **Policies of government:** The chief minister has repeatedly echoed and fed these fears by pointing to the presence of Myanmarese in Churachandpur, and linking them to the cultivation of poppy, and repeatedly making references to "foreigners" and "outsiders".

Reasons behind Kuki-Meitei Divide & Recent Unrest

- **Cultural geography:** Manipur has 16 districts however the state is commonly thought of as divided into 'valley' and 'hill' districts.
- The valley districts of Imphal East, Imphal West, Thoubal, Bishnupur, and Kakching were part of the erstwhile **kingdom of Kangleipak,** ruled by the **Ningthouja dynasty.**
- The tribal areas outside the valley were also part of the kingdom, but this is disputed by the tribes, in particular, the Naga tribes.
- The low hills surrounding the Manipur valley extend into Nagaland and Mizoram and comprise the majority of Manipur's geography. These areas are home to 15 Naga tribes and the Chin-Kuki-Mizo-Zomi group, which includes various peoples such as the Kuki, Thadou, Hmar, Paite, Vaiphei, and Zou.

- **History:** The Kangleipak kingdom was a **British protectorate** and was repeatedly raided by Naga tribes who came down from the northern hills.
- The **British political agent** in Manipur is believed to have **brought the Kuki-Zomi from the Kuki-Chin hills of Burma** to protect the valley from plunder by acting as a buffer between the Meiteis and the Nagas.
- The Kukis, like the Nagas, were fierce headhunting warriors who were given land by Maharaja along the ridges, where they could act as a shield for the Imphal valley below.

Genesis of Kuki-Meitei divide

- **Naga national movement:** Ethnic tensions between hill communities and Meitei date back to the old kingdom but worsened with the rise of the Naga national movement in the 1950s and the call for an independent Naga nation.
- The Naga insurgency was countered by the rise of insurgent groups among the Meiteis and Kuki-Zomi.
- **Kuki- Land:** In the 1990s, as the NSCN-IM pushed harder for self-determination, this led to the militarization of the Kuki-Zomi groups and the Kukis launched their own movement for 'Kukiland' — unlike the Naga movement, however, the Kuki-Zomi demand was for a state within India, not a separate national homeland.
- Kukiland's demand created a rift between Metei and Kuki.
- **Cornered in one district:** During the Naga-Kuki clashes of 1993, NSCN-IM fighters allegedly drove Kuki residents from villages in areas they claimed as belonging to Nagas. Many Kukis fled to Churachandpur, which increased their sense of insecurity due to being cornered in one district.
- **Dilution of constitutional safeguard:** Critics' opinion that the approach by the state government and valley-based civil society organizations (CSOs) to dilute the **intra-state constitutional asymmetry** under **Article 371C** and undermine the historical protection for tribal land rights by attempting to extend the Manipur Land Revenue and Land Reforms Act, 1961 (MLR&LR Act) to the hill areas to led to the tribal uprising.
- **Churachandpur district:** Kuki-Zomi-dominated Churachandpur in the state's southwestern corner sprawls over 4,750 sq km of plains and hills, dominated by Christians.

- The Panchayati Raj Ministry in 2006 named it among the country's poorest districts and it remains abjectly poor.
- In 2015, when the Meitei community demanded the introduction of ILP in Imphal, Churachandpur witnessed intense protests against the demand and the laws introduced by then Chief Minister Okram Ibobi Singh.
- These laws allowed the state to determine who was a Manipuri and required individuals to establish their "authenticity" to own land in the state.
- The Kuki-Zomi tribes, burdened by the "foreigner" label, reacted violently, leading to the withdrawal of the Bills.

Meitei insecurity:

- The Naga and Kuki movements contributed to Meitei nationalism, leading to the emergence of various groups in the valley.
- Concerns over demographic change and the shrinking of traditional Meitei areas started to surface in the 1970s.
- **Nagalim:** In 2001, the Indian government's decision to extend the ceasefire with the NSCN-IM to states other than Nagaland led to violence in Manipur, fueling the demand for Scheduled Tribe status for Meiteis.
  - According to NSCN(IM) greater Nagalim comprises of all Naga-inhabited areas showing a 1,20,000 sq km sprawl across the Northeast and Myanmar.
  - It covers a sizeable portion of Assam's Tinsukia, Charaideo, Sivasagar, Jorhat, Golaghat, Karbi Anglong and Dima Hasao districts; all of Longding, Tirap, Changlang, Lohit and Namsai districts in Arunachal; and large parts of Manipur's Ukhrul, Senapati, Chandel and Tamenglong districts.
  - The area of Nagaland state is only 16,527 sq km, a fraction of the NSCN(IM)'s "Greater Nagalim"
- The Meitei population feared the possible creation of Greater Nagalim would lead to the shrinking of Manipur's geographical area.
- **Porus borders:** The demand for an Inner Line Permit in Manipur emerged from 2006 to 2012, reflecting fears of demographic change caused by the free movement of the Kuki-Zomi across the border with Myanmar.
  - An inner Line Permit (ILP) is an official travel document issued by the Government of India to allow inward travel of an Indian citizen into a protected area for a limited period. It is obligatory for Indian citizens from outside those states to obtain a permit for entering into the protected state.
- **Shrinking of oppurtunities and resources:** Meiteis contend that job reservations for STs give an unfair advantage and they are prohibited from buying land in the hills while tribals can buy land in the valley. Infrastructure development would open up Manipur further has increased insecurities in the region.

Way forward

- The recent clashes between the Kuki-Zomi tribals and the Meiteis is a reflection of these insecurities and aspirations.

- The Manipur government needs to create a more inclusive development agenda that addresses the concerns of all communities in the state and create opportunities for a peaceful resolution of ethnic tensions.

Constitutional Provisions

- Article **371-C** makes the following special provisions for **Manipur.**
- This Article was added by the **27th Constitutional Amendment Act** of 1971.
- The President is authorized to provide for the creation of a committee of the Manipur Legislative Assembly consisting of the members elected from the **Hill Areas of the state.**
- The President can also direct that the Governor shall have special responsibility to secure the proper functioning of that committee.
- The **Governor** should submit an annual report to the President regarding the administration of the Hill Areas.
- The Central Government can give directions to the State Government as to the administration of the Hill Areas.
- In this Article, the expression 'Hill Areas' means such areas as the President may, by order, declare to be Hill Areas.

How To Minimize The Threat From Improvised Explosive Devices?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Security issues

Prepp Mains Booster: Linkages between development and spread of extremism; linkages of organized crime with terrorism.

Context:

- Recently, five soldiers were killed and another was injured in a gunfight with militants in the **Rajouri-Poonch sector of Jammu division**.
- An explosive device was triggered when a search team established contact with a group of terrorists hiding in a cave in the Kandi forests, killing two soldiers.
- Previously in the month of April, an **IED (improvised explosive device)** killed 10 security personnel of the **District Reserve Guard in Chattisgarh's Dantewada area.**
- These incidents highlight the **lethal and indiscriminate nature of IEDs**, which pose a serious threat to the safety and security of **security forces operating in conflict zones.**

How can errors be minimised?

- **Avoid travel by vehicle:** Studies have shown that over **60% of casualties and deaths in Maoist-controlled** areas occur due to attacks on vehicles by **landmines or IEDs**, as observed in the recent incident in Chhattisgarh. Routine operations such as cordon-and-search, long-range patrolling, ambush-cum-patrolling, etc., **should be conducted on foot.**
- Vehicle travel should be limited to rare occasions and only when absolutely necessary for operational reasons.
- **Avoiding the same route:** The security forces **should not take the same route** for onward and return journeys and also forces **should travel at night** because timing of triggering IEDs is more challenging at night.
- **Avoid identification:** Olive green vehicles of the Army and light green vehicles of the CRPF are easily identified from a distance. Therefore security forces should take civilian or State Road Transport Corporation buses and avoid easy identification.
- **Use of armoured vehicles:** In war zones where vehicular deployment is necessary, security forces should have appropriate protective gear, including blast-resistant clothing, helmets, and eye protection.
- The vehicles should be equipped with features such as V-shaped and armour-plated hulls, **blast-resistant technology, and sandbagging** to minimize damage in case of an explosion.
- Mounting machine guns and other weapons on top of the vehicles with outward-facing rotary seats allows for 360-degree observation.
- It is crucial for security forces t**o travel in convoys of at least two to three vehicles, maintaining a distance of 40 to 50** meters between them. This ensures that if one vehicle is affected by a landmine, personnel in the other vehicles can respond effectively.positions and neutralize the threat.

- **Implementation of detection methods: Rigorous and regular** implementation of various detection methods, like metal detectors, ground-penetrating radar, and trained sniffer dogs, to locate and clear landmines and IEDs, is essential.
- **Aerial surveillance through drones** and road opening parties equipped with **UGVs (Unmanned Ground Vehicles),** can be used to detect the presence of terrorists.
- **Creating evacuation plans:** Areas known or suspected to contain landmines or IEDs can be mapped and contingency plans prepared for them.
- This includes establishing safe routes, setting up checkpoints, and creating evacuation plans as part of both preventive and mitigation measures.

What are some of the other measures that need to be undertaken?

- **Collaboration:** These include collaboration with international organizations, NGOs, and other countries **to share information, resources, and best practices**.
- **Legislation:** Legislative action is needed to make it mandatory to add **odoriferous chemicals and/or biosensors** to explosives used in manufacturing, mining, and other applications so that they can be **easily detected during shipment.**
- Legislative action is also necessary for **tighter regulations** on the production, distribution, and sale of explosives and detonators.
- **Enforcement of laws:** Implementation and enforcement of national and international laws, policies, and regulations aimed at preventing the use, production, and trade of landmines and IEDs.
- **Establishment of dedicated agency:** The U.S has set up the Joint Improvised-Threat Defeat Organization to "prevent, identify and defeat IEDs" and NATO's Counter-IED Centre of Excellence is based in Madrid;
- Though a small unit exists in India under the National Security Guard, it is high time that a dedicated agency is created under the Ministry of Home Affairs to coordinate the efforts of both the Government of India and the State governments, and to provide legislative, technological and procedural support to law enforcement agencies.
- **Building trust with locals:** locals usually do not divulge information for money alone due to enormous risks of retaliation by terrorists.
- Relationships have to be cultivated and goodwill generated among the local population on a long-term basis beyond and above transactional levels.

Way forward

- An IED ambush is not an isolated event but part of a larger network involving financiers, suppliers, transporters, builders, and triggermen. In Afghanistan alone, forensic investigation teams collected 5,000 fingerprints from IED remnants and

explosives after bomb blasts in just one year (2008-2009). This led to the identification of numerous suspects and accomplices involved in IED ambushes.

- Diligent and scientific investigation, establishment of linkages through meticulous collection and marshalling of evidence, framing of chargesheets, followed by speedy trials and conviction, serve as a strong deterrent to terrorism.

GENERAL STUDIES 4

The Rising Tide Of Dictatorship

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Democracy
Prepp Mains Booster: Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.

Context:

- The author, Shelley Walia, has discussed the decline of democracy and the evolution of modern forms of dictatorship in the article titled "The Rising Tide Of Dictatorship" published in The Hindu on 17th May 2023.
- Over the last few years, the use of violence as a weapon for retaining power has reduced while advancement in technology is used to manipulate public opinion under the smokescreen of safeguarding democracy.

Changing dynamics

- The changing dynamics in the post-industrial age revealed a decline in democracy and a failure to accept the new age of autocracy and its democratizing of violence.
- **Fascism which was experienced in the traditional systems of dictatorship has gone through an evolution into contemporary ideas of the state's brute power, which not only scorn the values of democracy but also attempt to deceitfully annex democratic practices.**
- The post-Holocaust era has revealed the capacities of the human race for evil.
- In her book, the **Origins of Totalitarianism, the political philosopher Hannah Arendt claimed that the human race can longer afford to take what was good in the past and call it heritage, and discard the bad in the hope that it will become a dead load that will become obscure with time.**
- She also observed that the subterranean stream of Western history has emerged and usurped the dream of Western tradition.
- Her observations have been proved by the evidence of the damage caused by the two World Wars and the rise of fascism which impacted the deep-rooted liberal philosophy that was popular in Europe.

- An understanding of humanity's capability for evil has reinterpreted the vision of history in which the triumph of democracy was guaranteed.

Authoritarian Rule and Nationalism

- While it is not true that humanity cannot learn lessons from history because the West did learn from the dark period in Europe between 1914 and 1945, it is true that these lessons have been forgotten.
- The **present world is experiencing an era of strident nationalism and xenophobia with the collapse of the hopes of progress, harmony, and democracy which were raised by the opening of markets in the 1980s and the collapse of Soviet Communism between 1989 and 1991.**
- A common characteristic of history is that it tends to repeat itself, particularly when people forget that war, dictatorship, and ethnic hostilities are not viable solutions to any conflict.
- Revolutions like the ones in France and Russia which led to the rise of brutal dictators or individuals with absolute power, like Napoleon and Stalin respectively, will lead to their eventual collapse as failed empires.
- Widespread corruption, high crime rates, governmental incompetence, and the collapse of the rule of law, fail to help humanity realize that such conditions are warnings of the rise of "strong man" politics.
- It has been observed that the public has forgotten about the violence and death that accompanied dictatorial regimes in the past as they put faith in leaderships that project competence and the ability to advance the cause of public and national welfare by disguising violence involved in their efforts to gain popular acceptance and respect.
- Therefore, it is clear that societies do not learn from the tyranny borne by a nation under dictatorial regimes.
- Stalin's brutal regime of secret police and leader worship did not deter Cuban revolutionaries from allowing their

revolutionary leader to seize absolute power and disallowing any political opposition as a consequence of which independent journalism is prohibited and information suppression prevalent in Cuba even today.

- Although the idea of authoritarian power is an eternal ambition of mankind, the complexion may change while the hubris of power remains.
- The book, Spin Dictators, by Russian economist Sergei Guriev and American political scientist Daniel Treisman, reveals the **abuse of modern communication technologies by authoritarian regimes for propaganda, giving birth to manipulative but non-bloody dictatorships.**
- The dictatorships of the past under Stalin and Napoleon who used violence to subjugate public opinion have been replaced by the modern dictatorships of Putin (Russia), Fujimori (Peru), Chavez (Venezuela), Orbán(Hungary), and Erdoğan(Turkey).
- It can therefore be concluded that humanity has not learned from the brutal dictatorships that have brought violence and bloodshed in their wake and resulted in the emergence of modern forms of tyranny.

Modern Dictatorships

- The **use of violence as a tool for retaining power has reduced and has been replaced by technological advancements which are strategically employed to manipulate public opinion through lies, and deception, under the pretext of safeguarding democracy.**
- Non-democratic leaders allow a limited amount of dissent in the independent media in exchange for reliability and acceptance.
- Censorship is replaced by indiscriminate regulations and lawsuits, elections are manipulated to look fair and honest through the use of money, force, and a cult of leadership that focuses on building mass appeal.
- Mass incarcerations and extermination of political opponents and dissidents have slowly transformed into majoritarian brute force actions which are justified as democratic by a subservient media but are actually far-right wing in sociopolitical nature.
- The Russian invasion of Ukraine has exposed Vladimir Putin and shed the image of being a democratic leader, and therefore he can no longer be described as a non-violent dictator.
- Sergei Guriev has claimed that **Putin's regime has completed a reversal from the spin dictatorship of the 21st century to a fear-based dictatorship of the 20th century.** This has been evidenced in the way Putin has attempted to detain and eliminate his political opponent, Alexei Navalny.
- In contrast to Putin, **Kim Jong-Un of North Korea, Bashar al-Assad of Syria, and Mohammed bin Salman of Saudi Arabia openly use subjugation, expurgation, and physical violence** to subdue political dissent and retain their control of power.

Media and Censorship

- Right-wing intellectuals have regularly attempted to strengthen the discourse of nationalism through the politics of image-building and exceptionalism which are activities that capture the attention of the masses.
- Authoritarianism has emerged as the single most defining feature of global politics.
- **Criticism of the political establishment has been sidelined and the dominant party discourse remains in full force,** brainwashing public opinion through doublespeak and sensible censoring through sophisticated surveillance and propaganda tools.
- News channels airing free debates are mere eyewash for showcasing the democratic inclinations of a despotic leadership through superficial adherence to democratic policy-making.

Conclusion

- The zeitgeist, or defining spirit of an era, of the post-Holocaust period that hoped for a future of justice and freedom has fallen by the wayside.
- Therefore, the primary concern of the present is to understand that the human race either faces the end of the free world or must rely on democratic impulses to overcome the rising forces of tyranny across the globe.

To know more about Totalitarianism and Authoritarianism, click the link.

PRELIMS

Gharial Seen In Pakistan's Punjab After 3 Decades; It Likely Crossed Over From India

Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: Environment
Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment, Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

Context:

- Recently, a gharial has been seen in Pakistan's Punjab province for the first time in three decades and could have been from a population reintroduced on India's side of the Radcliffe Line in 2017.
- Around 94 gharials were released into the Beas River in the Amritsar, Tarn Taran, and Hoshiarpur districts in three phases between 2017 and 2021 as part of the Punjab (India)

government's program to bring back the species to Indian rivers.

- The Beas and the Sutlej are two of the three eastern rivers of the Indus system whose waters are allocated to India under the provisions of the Indus River Waters Treaty, 1960.

Where has the Gharial been spotted?

- The **Gharial or Gavialis gangeticus has been spotted in the Punjab province of Pakistan for the first time in three decades.**
- The gharial could have been part of a population that was reintroduced on the Indian side of the Radcliffe Line in 2017.
- A post-graduate researcher at the Wildlife Conservation and Research Unit, at the University of Oxford, Bilal Mustafa said that the gharial, which is a crocodilian species unique to the Indian subcontinent, was **thought to be extinct in Pakistan as per the Pakistan Wildlife Conservation Strategy Report.**
- He also observed that the gharial has been added to the **IUCN-SSC Red List**.
- According to the researcher, a possibility is that the gharial came from India during the 2022 floods and stayed behind in the Satluj.
- Locals have claimed that there are almost ten gharials in the river, although their location has not been confirmed.
- The researcher also claimed that in 1913 the gharial could be found as far north as Peshawar while a stuffed specimen that was seen at Ferozepur can still be found there.

India's efforts to reintroduce the Gharial

- India has reintroduced the Gharial in the **Harike wetland**, which is around 50 Km from the India-Pakistan border and is likely to be where the gharial in Pakistan came from.
- Between 2017 and 2021, around 94 gharials were introduced into the **Beas River in the Amritsar, Tarn Taran, and Hoshiarpur districts in three phases** as part of the Government of Punjab (India) programme to bring back the species into its rivers.
- The **reintroduced Gharials were mostly obtained from the Chambal basin in Madhya Pradesh.**

- In 2020, the Government of Uttar Pradesh introduced the gharial into the **Ghaghara River** in order to conserve and protect the animal in its natural habitat.

How did the Gharial reach Pakistan?

- The senior coordinator of the World Wildlife Fund for Nature-India, Gitanjali Kanwar, who also participated in the Punjab Government program claimed that it was plausible that the gharial came from India, although verification of the claim is necessary.
- She also stated that they were aware of people using the unmanned sections of the Satluj at the border, which increases the chances of the gharials crossing the border.
- She added that the WWF knew that **gharials have made their way from Harike into the main channel of the Satluj, which crosses the international border and flows into Pakistan.**
- Kanwar also claimed that the river becomes highly braided after a few kilometers from Harike and that the animal crossed into Pakistan through one of the minor channels and not the major channel that passes through Hussainiwala, which is the last town on the Indian side in Ferozepur district.
- Hussainwala faces Ganda Singh Wala on the Pakistan side across the Satluj.
- According to Kanwar, **gharials have a tendency to migrate downstream, especially when in the juvenile and sub-adult stages of their life cycle.**
- The Punjab Forest Department and the WWF were successful in rescuing and recovering gharials that ventured into canals from Harike but did not need to rescue those in the main channel, as it was their natural habitat.
- Bilal expressed hope that the sighting of the gharial would lead to a cross-country collaboration between India and Pakistan similar to the one with Nepal.
- He requested the governments of the two countries to collaborate on a cross-border conservation project that could serve as a precursor to opening the border for people of both countries.
- He expressed hope that the Satluj would become a **Schengen area** for the gharial, which would act as an

ambassador for friendship and brotherhood between the two countries.

Gharials

- **Gharials, also known as gavials**, are an Asian crocodilian species that are characterized by their distinctive **long, thin snout**.
- The snouts resemble pots also called **ghara** in Hindi, which is how it got its name.
- Crocodilians are a group of reptiles including crocodiles, alligators, caimans, etc.
- Gharials are one of the three crocodilian species found in India along with the Mugger crocodile and Saltwater crocodile.
- Gharials are an indicator species whose presence indicates the availability of clean river water.

Habitat:

o The natural habitat of the gharial is the fresh waters of North India. Its primary habitat in India is the Chambal River basin in Madhya Pradesh and its secondary habitat includes the Ghagra, Gandak, Girwa, Ramganga, and Son Rivers.

o It prefers the sandbanks along the river and lay eggs in the sandy soil near the water.

Conservation status:

o **Critically Endangered on IUCN Red List**
o **Schedule I of The Wildlife Protection Act, 1972**
o **Appendix I of CITES**
- **Conservation sites:** Sites of gharial conservation in India include the **Kukrail Gharial Rehabilitation Center, Lucknow, and the Gharial Eco Park in the National Chambal Sanctuary.**
- **Threats:** Threats faced by the gharials include increased river pollution, illegal sand mining, dam construction, floods, massive-scale fishing operations, and poaching.

Mentions in literature:

o The earliest mention of the gharial in Pakistan is from a description by the **Mughal Emperor Babur**, which is now possessed by the British Library. He described the gharial as a beast as green as a parrot with a large ghara on its snout that came up onto the bank in straight lines to bask and hunted fish.

o The earliest depictions of the gharial are from the **seals of the Indus Valley Civilization,** now located in the Ashmolean Museum in Oxford.

Harike Wetland

- The **Harike wetland is the confluence of the Beas and the Satluj** which are two of the three eastern rivers of the Indus river system.
- The waters of the Ravi, Beas, and Satluj have been allotted to India according to the 1960 Indus Waters Treaty.
- It is one of the largest wetlands in Northern India, located in the Tarn Taran and Ferozepur districts of Punjab.

- It was accorded the status of a **Ramsar site** in 1990 and is an important source of fish for local communities.
- Harike is home to numerous migratory birds from the Arctic and Siberia as well as fish species such as carp, rohu, and catfish.
- It was declared a bird sanctuary in 1982 and named the **Harike Pattan Bird Sanctuary.**

Inaugural ASEAN-India Maritime Exercise In South China Sea

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster:ASEAN
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India.

Context:

- The inaugural **ASEAN-India Maritime Exercise (AIME-2023)** will commence in Singapore, with the sea phase taking place in the South China Sea.
o The Indian Navy's **INS Satpura and INS Delhi** will take part in the weeklong exercise, which will include a two-day sea phase in the **South China Sea.**

Background

- The first ASEAN-India maritime exercise (AIME-2023) will begin amid the rising presence of the Chinese Navy in the Indian Ocean.
- The decision by New Delhi to expand its maritime security cooperation with the ASEAN region comes in the midst of China's growing belligerence not only on land in eastern Ladakh along the Line of Actual Control, but also in the Indian Ocean, South China Sea, East China Sea, Taiwan Strait, and elsewhere in the Indo-Pacific Region.

About ASEAN-India Maritime Exercise (AIME-2023)

- In the process to take India-ASEAN (Association of Southeast Asian Nations) relationship to the next level Admiral R Hari Kumar, Indian Navy chief, reached Singapore to participate in the Inaugural ASEAN India Maritime Exercise (AIME-2023).

- The AIME-2023 drill is slated to take place in two parts, and the Indian Naval Ships (INSs) Satpura and Delhi will participate.
- **The exercise's Harbour Phase will take place at Changi Naval Base,** while the **Sea Phase will take place in the South China Sea.**
- With AIME-2023, **India joins Russia, China, and the United States as the fourth ASEAN dialogue partner to host the ASEAN+1 maritime exercise,** which will include navies from the Philippines, Cambodia, Myanmar, Malaysia, Singapore, Indonesia, Thailand, Vietnam, Laos, and Brunei.

Participating Ships

- **INS Delhi,** India's first indigenously built guided missile destroyer.
- **INS Satpura,** an indigenously built guided missile stealth frigate.
- Both are part of the Indian Navy's Eastern Fleet, which is located in Visakhapatnam.
- During their port visit in Singapore, the ships will also take part in the International Maritime Defence Exhibition (IMDEX-23), as well as the International Maritime Security Conference (IMSC).

Importance of the exercise

- The exercise would allow the Indian Navy and the warships of ASEAN to collaborate closely and execute seamless maritime operations.
- It will strengthen collaboration, enhance understanding, and build confidence to address common maritime security challenges at sea.

> **About the Association of Southeast Asian Nations (ASEAN)**
> - It is a regional intergovernmental organization of ten Southeast Asian countries.
> - It was founded in 1967 with the signing of the Bangkok Declaration.
> - Its aim is to foster intergovernmental cooperation and enhance economic, political, security, military, educational, and socio-cultural integration among its members and other Asian governments.
> - **Members include** Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Laos, Myanmar, Cambodia, and Vietnam.

South China Sea

- The South China Sea is one of the world's busiest waterways, serving as a crucial commercial and maritime transportation route.
- The South China Sea dispute involves maritime and island claims between the region's sovereign governments.
- These conflicts include China, Brunei, Taiwan, the Philippines, Vietnam, and Malaysia, all of which are geopolitically located in the Indo-Pacific area.
- The Sea is regarded to be a significant source of natural resources for the various territories. It supplies around 10% of

the nation's fisheries, making it a key source of food for hundreds of people.
  - o This is also a big reason why individuals from other countries are claiming ownership of the sea.

India's Position in the South China Sea

- India has stated that it is not a party to the SCS issue and that its presence in the SCS is to preserve its own economic interests, notably its energy security needs.
- However, China's growing ability to decide and expand its role in the South China Sea has forced India to reconsider its position.
- As part of the Act East Policy, India has been internationalizing Indo-Pacific issues in order to confront China's threatening actions in the South China Sea.
- India is utilizing its Buddhist roots to establish strong relations with Southeast Asia.
- India has also deployed its fleet in the South China maritime with Vietnam to secure maritime lines of communication (SLOC), denying China any space for claim.
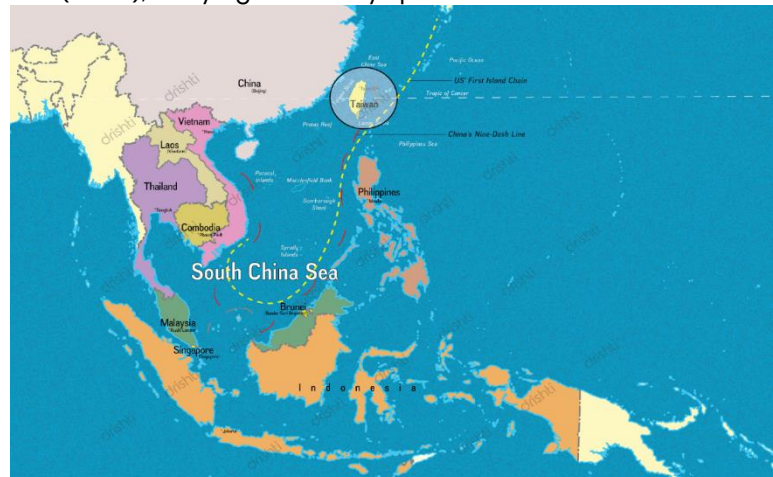
Why Are Financial Regulators Transitioning From LIBOR?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Indian Economy

Context:

- Recently, the RBI stated that some banks and financial institutions were yet to facilitate an absolute transition away from the **London Interbank Offered Rate (LIBOR)** benchmark.
  - o LIBOR will be phased out by June 30, 2023, according to the Federal Reserve and UK regulators, and will be replaced with the **Secured Overnight Financing Rate (SOFR).**

What is LIBOR?

- The **London Interbank Offered Rate (LIBOR) is a benchmark interest rate used by major international banks in the international interbank market to lend to one another for short-term loans.**

- It is used as a benchmark to settle trades in futures, options, swaps and other derivative financial instruments in over-the-counter markets (participants engaging directly without using an exchange) and on exchanges globally.
- The **rate is calculated and published every day by the Intercontinental Exchange (ICE),** but it is being phased out due to recent scandals and issues about its legitimacy as a benchmark rate.

*To read this topic in detail, click LIBOR

How does LIBOR work?

- ICE Benchmark Administration (IBA) is in charge of the administration.
- The Financial Conduct Authority (FCA) of the United Kingdom regulates it.
- Intercontinental Exchange polls major worldwide banks every day to see how much they would charge for short-term loans.
- The average is then calculated using these numbers.
- It is based on five currencies: The US dollar, Euro, British Pound, Japanese Yen, and Swiss Franc, and it has seven possible maturity periods.
- Each business day, 35 separate LIBOR rates are calculated and presented due to the combination of 5 currencies and 7 maturities.
- The three-month US dollar rate, often known as the current LIBOR rate, is the most commonly cited rate.
- ICE polls major worldwide banks every day to find out how much they would charge other banks for short-term borrowing. The association subtracts the top and lowest numbers before calculating the average of the remaining figures.
- Trimmed average is the term for this. This rate is updated every morning as the daily rate, therefore it is not a constant.
- Once the rates for each term and currency have been calculated and finalized, the ICE Benchmark Administration announces and publishes them once a day at around 11:55 a.m. London time (IBA).

Why is the LIBOR being phased out?

- **Financial Crisis:** LIBOR is being phased out because of the role it played in worsening the 2008 Financial Crisis, as well as scandals involving LIBOR manipulation among rate-setting banks.
- **Rate-fixing revelations:** The credibility of LIBOR was harmed in 2012 by rate-fixing revelations. The responses of the panel banks were said to be erroneous or manipulated in order to forecast market strength.
- After the Wheatley Review in 2012, a number of modifications were implemented to remove subjective input and transform LIBOR into a transaction-based benchmark.

- Despite these improvements, the volume of transactions in the short-term wholesale Funding Market has decreased over time.
- LIBOR becomes increasingly subject to short-term market illiquidity and the amplification of price movements that might pose systemic hazards as a result.

What is the alternative?

- The **US Federal Reserve introduced the Secured Overnight Financing Rate (SOFR) as a preferred option.**
- As a result, new transactions in India were to be conducted using the SOFR and the Modified Mumbai Interbank Forward Outright Rate (MMIFOR), which were to replace MIFOR.
- According to the International Finance Corporation (IFC), it is based on observable repo rates, or the cost of borrowing cash overnight that is collateralized by US Treasury securities.
- As a result, it is now a prevalent transaction-based rate, rather than requiring an expert judgment as in LIBOR. This might perhaps make it less vulnerable to market manipulation.
- MMIFOR would include modified SOFR (compounded in arrears for various tenors and derived from Bloomberg Index Services) among other components.

About SOFR

- The Secured Overnight Financing Rate (SOFR) is a benchmark interest rate for dollar-denominated derivatives and loans that is replacing the London Interbank Offered Rate (LIBOR).
- SOFR is based on transactions in the Treasury repurchase market and is seen as preferable to LIBOR since it is based on data from observable transactions rather than on estimated borrowing rates.
- SOFR is published on each market business day at 8 a.m. ET.

India Slips In World Press Freedom Index, Ranks 161 Out Of 180 Countries

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: World Press Freedom Index
Prepp Mains Booster: Fundamental Rights, Important indices, Important International institutions, agencies and fora

Context:

- Recently, India's rank has fallen from 150 to 161 out of 180 countries on the World Press Freedom Index published by Reporters Without Borders.
- A joint statement by the Press Association, the Press Club of India, and the Women's Press Corps expressed concern that the indices of press freedom have worsened in several countries including India.

What is the World Press Freedom Index?

- The **World Press Freedom Index is published annually on May 3rd, World Press Freedom Day, by the Reporters Sans Frontiers or Reporters Without Borders(RSF)**, an NGO headquartered in Paris.
- According to the RSF, which has consultative status with the UN, **press freedom is the ability of journalists as individuals and collectives to select, produce and disseminate news in the public interest independent of political, economic, legal, and social interference and in the absence of threats to their physical and mental health.**
- The Index, first published in 2002, ranks countries on the basis of the freedom available to journalists in 180 countries and territories in the previous year.
- Rankings are calculated through a score between 0 and 100 that is assigned to a country.
- Scores are assigned to the country following an evaluation of five contextual indicators:
  - **Political context:** Evaluates support and respect for media autonomy from the political establishment, and degree of support for the media in its role of holding politicians to account in the public interest.
  - **Legal framework:** Evaluates freedom of journalists to work without censorship, sanctions, and restrictions, the ability to access information without discrimination, protection of sources, and legal action against those responsible for violence against journalists.
  - **Economic context:** Evaluates economic constraints related to the state, non-state actors, and media owners. It includes factors like the allocation of subsidies, access to advertisements, etc.
  - **Sociocultural context:** Evaluates social constraints on the press such as gender, caste, and religious attacks, and cultural constraints such as pressure on journalists not to question traditional power sources in a country.
  - **Safety:** This indicator defines press freedom in terms of the capacity of journalists to identify, gather and disseminate news in accordance with journalistic methods and ethics, without unnecessarily risking bodily harm, emotional distress, and professional harm.
- Subsidiary scores obtained on the indicators contribute equally to the country's total score.
- The RSF classifies scores obtained by countries in the following manner.
  - 100 - 85: Good (green)
  - 85 - 70: Satisfactory (yellow)
  - 70 - 55: Problematic (light orange)
  - 55 - 40: Difficult (dark orange)
  - 40 - 0: Very serious (red)
- Other factors considered by the Index include pluralism, media independence, self-censorship, media environment, infrastructure quality, legislative framework, and transparency.

How have countries performed in the 2023 edition?

- **Norway has topped the World Press Freedom Index for the seventh consecutive time**.
- Ireland has improved its position and is placed second followed by Denmark**.** It is unusual that a non-**Nordic country**, Ireland, has secured second place this year, according to the RSF.
- **Vietnam(178th), China(179th), and North Korea(180th) were the worst-performing nations** in the 2023 Index on account of propaganda and having jailed and attacked the most number of journalists globally.
- **India's ranking has slipped from 150 in the 2022 edition to 161 in the 2023 edition** and has been described as a **"hybrid regime"** in the report.
- **India's score has fallen from 41 in 2022 to 36.62 in 2023** and has been scored lower on all five indicators than in the previous year.
- On the other hand, Pakistan has improved its standing from 157th in the 2022 Index to 157 in 2023.
- Sri Lanka also moved upwards significantly, improving its rank from 146th in 2022 to 135th in 2023.

FREEDOM OF THE PRESS WORLDWIDE 2023

What are the reasons for India's poor performance?

- According to the RSF, India - the world's largest democracy - was undergoing a crisis of press freedom which was indicated by the increasing violence against journalists, the presence of politically partisan media groups, and the concentration of media ownership.
- Although India has around 1,00,000 newspapers and 380 news channels, ownership was concentrated among a few, particularly among regional news outlets. Moreover, the report noted that advertisements affected editorial policy.
- The report also mentioned close relationships between businessmen who owned media houses and the political establishment, and harassment and detention of critical journalists as concerns.
- According to the report, the diversity of India's population was not reflected in the media with most senior executive positions in the media being held by men and upper castes.
- The report concluded that three-to-four journalists were killed on average every year in India and that the press was subject to attack by criminals, communal groups, and corrupt officials.

Other Concerns

- A joint statement by the Press Council of India, the Press Association, and the Women's Press Corps has voiced concern over India's poor performance on the Index.
- They stated that the indices of press freedom have fallen in several countries across the world, including India.
- The media's role cannot be understated in the developing democracies of the Global South where inequalities are still deep-rooted.
- The constraints on press freedom due to unfavorable working conditions such as contractorization posed a challenge to effective journalism as insecure work environments could not guarantee a free press.

Supreme Court Upholds Laws Allowing Jallikattu, Kambala

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Jallikattu

Prepp Mains Booster: Indian culture; Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure, Structure, organization and functioning of the Executive and the Judiciary,

Context:

- Recently, the Supreme Court upheld the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017 and the Prevention of Cruelty to Animals (Conduct of Jallikattu) Rules of 2017 stating that 'Jallikattu' has been going on in Tamil Nadu for the last century.
- The Court ruled that the amended acts substantially reduced pain and cruelty to the animals and that it could

not be termed a blood sport, as no weapon was used and any bloodshed was accidental.

What has the Supreme Court ruled on Jallikattu?

- The Supreme Court upheld the **Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017** and the **Prevention of Cruelty to Animals (Conduct of Jallikattu) Rules, 2017** by stating that the traditional bull-taming sport has been going on in Tamil Nadu for a century.
- The judgment was delivered by a five-member bench headed by Justice K.M. Joseph in a series of petitions challenging laws of Tamil Nadu and Maharastra permitting the sport.
- The main petitioner was the **Animal Welfare Board** while animal welfare organization PETA also challenged the state law permitting Jallikattu. Respondents in the case included individuals and organizations related to the sport in Tamil Nadu such as the Bull Owners Association.
- Other parties in the case are CUPA, the Federation Of Indian Animal Protection Organisations and Animal Equality, the Union of India, and the State of Tamil Nadu.
- The Constitution Bench observed that two laws cannot be interpreted as "colorable legislation" and ruled that the State legislature was empowered to make these amendments as per **Entry 17 to List III of the Seventh Schedule (Prevention of Cruelty to Animals).**
- The verdict holds that the 2017 Amendment and the Rules on Jallikattu comply with Entry 17 of the Concurrent List and the fundamental duty under **Article 51A(g) that relates to compassion for living creatures.**

- According to the Court, the Amendment Act substantially reduced the pain and cruelty faced by the participating animals.
- Kapil Sibal arguing for the State of Tamil Nadu argued that the test for the Court was to see if the pain caused to the animals was unnecessary as it was natural for animals to suffer some pain in the process of domestication or otherwise.
- The Amendment Act and the Rules were developed in 2017 in the aftermath of the **Animal Welfare Board vs A.**

Nagaraja judgment (2014) which banned the conduct of the sport.

- The Court observed that the Amendment introduced a sea change in the way Jallikattu is conducted through the introduction of stringent safeguards to ensure man and animal were protected from danger. The Court further directed that the Amendment and the Rules had to be strictly observed.
- The Court stated that **any violations of the statutory law i.e. the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017 would attract the provisions of the penal law and claimed that cultural tradition would not be a suitable defense if the practice offends the law.**
- The court observed that the Amendment Act leaves no room for cruelty towards the animals and remedies the malpractices which were prevalent prior to the enactment of the law.
- The **Court found that Jallikattu did not violate Articles 14 and 21 of the Constitution as the petitioners argued that animals had the right to live with dignity.**
- In 2018, a bench of CJI Dipak Misra and Justice Rohinton Fali Nariman ruled that the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017 needed to be heard by a larger bench as it involved substantial questions related to the interpretation of the Consitution and framed a set of five questions to be adjudicated by the larger bench.
- The **Court found that Jallikattu could not be termed a blood sport as none of the participants are using weapons and that any blood split is accidental** despite the inherent cruelty of the sport.
- In December 2022, the Court raised the question of whether animals could be used in Jallikattu for the entertainment of humans. It stated that participants did not participate to kill the animal despite the cruel nature of the sport that forces the animal to perform.

What did the bench say on the question of cultural heritage?

- The primary question considered by the Court was whether Jallikattu should be granted constitutional protection as a **collective cultural right under Article 29(1).**
- However, the ruling delivered by the **Court did not consider the question of whether Jallikattu is an integral part of the culture of Tamil Nadu.**
- Justice Bose, who authored the judgment, ruled that the question of Jallikattu being an integral part of Tamil culture could not be answered in a courtroom through judicial proceedings. It requires greater study, representation, and participation of the people.
- The **Court recommended the House of the People in the state as the appropriate body to decide this question** and not a court of law hearing a writ petition.

- The Court stated that it would not disrupt the view of the legislature and **since the legislature has adopted the view that Jallikattu is a part of the state of Tamil Nadu's cultural heritage, it is declared part of the culture and heritage of the state as the Amendment has already received Presidential assent.**

Jallikattu

- "**Jallikattu**", otherwise known as "**Eruthazhuvuthal**", is a **bull-taming sport organized in Tamil Nadu as part of the Pongal harvest festival** in the second week of January.
- It is popular in the districts of **Madurai, Tiruchirapalli, Theni, Pudukottai, and Dindigul - an area popularly known as the Jallikattu belt.**

- Jallikattu, considered to be a tradition of more than 2000 years, is a competitive sport that honors bull owners who rear the bulls for mating.
- It is a violent sport, in which participants aim to tame the bull by grabbing the hump and riding the bull for a prize, if they are unsuccessful the bull owner is rewarded with the prize.
- Supporters of Jallikattu, including conservationists argue that in an era of artificial breeding of cattle, the sport is a way to protect the bulls which are otherwise used only for plowing and for meat.
- A **similar sport is organized in coastal Karnataka called Kambala in which buffaloes are raced through slush and mud-filled paddy fields**. The five-judge bench verdict also permitted the organization of Kambala races.

Karnataka Ranked The Most 'Innovative' State By The National Manufacturing Innovation Survey

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: National Manufacturing Innovation Survey

Prepp Mains Booster: Indian Economy and issues relating to planning, mobilization, of resources, growth, development

Context:

- Recently, the **National Manufacturing Innovation Survey 2021-22** was released by the **Department of Science and Technology (DST)**.
- The survey found that Karnataka, overall, is the most "innovative" State, followed by Dadra and Nagar Haveli, Daman and Diu (DNH&DD), Telangana, and Tamil Nadu.
- Telangana, Karnataka, and Tamil Nadu had the highest share of innovative firms at 46.18% ,39.10% and 31.90%, respectively, with Odisha, Bihar, and Jharkhand reporting the lowest share of such firms at 12.78%, 13.47% and 13.71%, respectively.

National Manufacturing Innovation Survey 2021-22

- The National Manufacturing Innovation Survey 2021-22 was conducted jointly by the Department of Science and Technology (DST) and the United Nations Industrial Development Organization (UNIDO) in India in order to evaluate the innovation performance of manufacturing firms.
- The NMIS 2021-22 study was conducted as a **two-pronged survey** that firstly examined the innovation processes, outcomes, and barriers in manufacturing firms, and secondly, it studied the innovation ecosystem that affects innovation outcomes in these firms.
- The latest survey is a **follow-up to DST's first National Innovation Survey** held in 2011.
- The NMIS 2021-22 survey had two specific components:
  o the firm-level survey and
  o the sectoral systems of innovation (SSI) survey.
- **Firm-level survey:** It captured data related to types of innovations and innovative measures taken by firms, including the process of innovation, access to finance, resources, and information for innovation, besides also recording the factors impacting the innovation activities in a firm.
- One in four firms was found to have successfully implemented an innovation in the observation period, and over 80% of these firms benefited significantly in expanding markets and production and reducing costs.
- **Sectoral System of Innovation survey:** It mapped the manufacturing innovation system and its enabling role in achieving innovations in firms.
- The SSI study measured the interactions between stakeholders of the innovation ecosystem, relative barriers to innovation, as well as the convergence or divergence of current policy instruments in select five key manufacturing sectors important to the Indian economy – textiles; food & beverage; automotive; pharma; and ICT.

What are the findings of the National Manufacturing Innovation Survey?

- **Lack of innovation:** It was reported that only 25.01 percent of the 8,074 MSMEs and large firms surveyed were considered innovative.
- The firms successfully implemented either new or significantly improved products or processes (marketing and sales, procurement, or other organizational methods in their business practices) during the survey period, and did **not introduce any new innovative products or business processes between 2017-2020.**
- However, almost 80% of the firms that **did innovate reported** noteworthy benefits, such as **expanding their markets and reducing production costs.**

Barriers to innovation

- **Lack of funds:** Lack of funds within the group or firm was cited as most frequent barrier.
- **Innovation costs:** High cost of innovation as cited as barrier according to 40.30 percent of firms
- lack of external sources was another barrier.
- low demand for innovations in the market
- Organizational rigidities.
- Insufficient innovation potential and lack of qualified personnel were the most frequent barriers related to potential and capability nationwide as well as in most states, irrespective of their innovation rank.

Disparity among states

- **Industrialized states:** According to the survey, Gujarat and the union territories of Dadra and Nagar Haveli and Daman and Diu reported the highest frequencies of barriers to innovation.
- These states have a higher concentration of established businesses and industries such as chemicals, textiles, plastics, pharmaceuticals, and electronics.
- As a result, existing firms in these regions may be less inclined to take risks on new technologies and processes and may have more deeply rooted organizational structures and cultures, contributing to higher barriers to innovation.

- **Innovative states:** Despite the creation of supportive innovation ecosystems, such as technology parks, incubators, and accelerators by highly innovative states such as Telangana, Karnataka, Maharashtra, and Tamil Nadu, reported average to high (higher than the national average) frequencies of barriers.
- **Low innovative states:** In contrast, some of the low innovative states reported **low frequencies in barriers** such as Uttar Pradesh, West Bengal, North-eastern states (excluding Assam), Odisha and Andhra Pradesh.

Significance of survey

- **Current innovation activities:** The survey provided insights into a practical understanding of the current innovation practices of the Indian manufacturing industry and ways to overcome organizational inflexibility in order to meet market demand for innovative products.
- **Decision-making:** The findings of the survey, which **identified obstacles and difficulties** in technology learning, innovation, and development, would be used to create policies, initiatives, and partnerships that would enhance the benefits and outcomes of innovation.

Conclusion

- The NMIS survey shows that innovation is **not yet common in manufacturing** but has proved to be profitable for firms. Therefore, a focus on manufacturing innovation is needed in addition to expanding production.

United Nations Industrial Development Organization (UNIDO)

- UNIDO is a specialized agency of the United Nations with a unique mandate to promote, dynamize and accelerate industrial development.
- Its mandate is reflected in Sustainable Development Goal (SDG) 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation", but UNIDO's activities contribute to all the SDGs.
- **Vision:** Its vision world without poverty and hunger, where industry drives low-emission economies, improves living standards, and preserves the livable environment for present and future generations, leaving no one behind.
- UNIDO provides support to its 171 Member States through four mandated functions: technical cooperation; action-oriented research and policy-advisory services; normative standards-related activities; and fostering partnerships for knowledge and technology transfer.

Bihan Mela: A Seed Festival Aims To Help Tribal Kondh Farmers In Odisha Return To Their Agricultural Traditions

Priority: Medium

Primary Source: Down to Earth

Prepp Prelims Booster: Bihan Mela

Prepp Mains Booster: Indian Society and Culture; Major crops-cropping patterns in various parts of the country, - Different types of irrigation and irrigation systems storage,

Context:

- The **members of the Kondh tribe in Odisha's Nayagarh district have added Bihan Mela, meaning "seed festival," to their calendar of festivals and celebrations.**
- The seed festival and bank will encourage farmers to adopt indigenous varieties and traditional farming methods that have been abandoned since the Green Revolution.

What is a Seed festival?

- A seed festival is an event that celebrates the diversity of seeds and promotes the conservation and exchange of traditional and rare varieties of seeds.
- These festivals are usually organized by seed conservationists, farmers, and NGOs and are held in different parts of the world.

About Bihan Mela

- Bihan Mela is also known as the seed festival and the event is participated by the farmers.
- Preparations begin as soon as farmers harvest Kharif crops, which include hybrid and indigenous types of rice, millets, maize, and sorghum.
- Women are in charge of this celebration by meticulously collecting seeds of local species and storing them in clay pots.
- On a specific day in December, they decorate the pots with red and white designs, set them in a bamboo basket, and carry it on their heads to the hamlet where the fair is held.
- This was implemented to assist farmers in returning to traditional agricultural practices such as mixed cropping.

Why was the festival introduced?

- Farmers in the region are largely subsistence farmers who rely on monsoon rainfall. Crop failures have occurred on many occasions in recent years, either as a result of unpredictable rainfall or insect infestations.
- Farmers in the region have abandoned local crops and kinds that are naturally resistant to pests and better suited to the region's environment since the Green Revolution.

- Even in dongars or hilltops, where communities used to practice mixed farming until recently, monoculture cash crops such as cashew have taken over.
  - This has not only harmed their food and nutritional security, but it has also deteriorated the land and rendered farmers more vulnerable to crop failure.
- The seed festival was thus established to assist farmers in returning to ancient traditional methods such as mixed-cropping.

> **About Kondh tribe**
> - They are a tribal community situated in the hills and jungles of Orissa, India's easternmost state.
> - They have various sub-tribes, including the Dongria, Kovi, Kuttia, Languli, Penga, and Jharnia. Raj Konds, and so forth.
> - These tribal people speak the languages Kui and Kuvi.
> - These are Dravidian languages, with considerable affinities to Telugu, Tamil, and Kannada.
> - The language has no script of its own, with Kui written in Oriya and Telugu script used for Kuvi.

Steps to promote indigenous seeds

- **Seed banks** can be developed to save indigenous seeds and crops. This helps to preserve their genetic variety and prevents extinction.
- **Financial incentives:** Governments and other organizations can give financial incentives to farmers who raise indigenous seeds and crops. Subsidies, tax rebates, and other forms of compensation may be included.
- **Research** may be performed to determine the potential advantages and applications of indigenous seeds and crops. This can help to boost their worth and stimulate their cultivation.
- **Creating markets** for indigenous seeds and crops can assist to generate demand and support their development. This might involve marketing them in local markets, producing value-added goods, and establishing export potential.
- **Collaboration with indigenous populations** is critical in promoting indigenous seeds and crops. This involves collaborating with them to discover and safeguard their traditional seed and crop growing knowledge and methods.

Conclusion

In addition to promoting seed conservation, seed festivals also play an important role in building community resilience and supporting local food systems. By encouraging the exchange of seeds and knowledge, these festivals help to create a more decentralized and diverse food system that is less dependent on industrial agriculture and multinational corporations.

Nano Urea In Field Trials: Farmers Disillusioned, Say No Payoff On Crops

Priority: Medium

Primary Source: Down to Earth

Prepp Prelims Booster: Nano Urea

Prepp Mains Booster: Major crops-cropping patterns in various parts of the country, - different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

Context:

- Nano liquid urea, a specialized fertilizer, was recommended as a better substitute for granular urea as it could cut costs for farmers, reduce import bills, and increase farm yields but these benefits are unlikely to reduce the dependence on packaged urea.
- Urea is one of the most concentrated nitrogenous fertilizers which converts into ammonia in the soil.
- Farmers who faced losses in wheat production due to untimely rain were worried after using nano urea which is expensive but not producing any results.

What is liquid nano urea?

- Liquid nano urea is urea in the form of a nanoparticle. The size of a nano-nitrogen particle ranges from 20 to 50 nm.
- Liquid nano urea comprises **4% total nitrogen (w/v)** that is equally distributed in water.
- It is an alternative to conventional granular urea and provides nitrogen to the soil.
- It has been developed by the **IFFCO Nano Biotechnology Research Centre, Kalol, Gujarat.**
- The objective behind the development of liquid nano urea is to r**educe the unbalanced and indiscriminate use of conventional granular urea, increase crop productivity, and reduce soil, air, and water pollution.**

Why is liquid nano urea promoted by the government?

- Urea is one of the most concentrated nitrogenous fertilizers available. It converts to ammonia, an essential macronutrient for plant functions, in the soil.
- However, I**ndia is dependent on imports for its urea stocks, importing around 25% of its urea requirements.**
- Liquid nano urea is a specialized fertilizer whose advantages include l**owered costs for farmers, reduced import bills for the government, and increased farm yields.**
- The Central Government has actively promoted the fertilizer since its development in 2021.
- According to the Indian Farmer Fertilizer Cooperative Ltd (IFFCO), nano urea contains nitrogen in the form of granules that are a hundred-thousand times finer than a sheet of paper and a 500 ml bottle was equivalent to a 45 kg bag of conventional urea.
- A 45 kg bag of urea which costs around ₹ 3,000 is sold to farmers at a subsidised cost of ₹242 while a 500 ml bottle of nano urea is currently sold at ₹225 per bottle.
- The IFFCO received a permit to export nano urea to Sri Lanka in October 2021 but the export demand has been halved between 2021-22 and 2022-23.

What is the significance of Liquid Nano Urea?

- Liquid nano urea is a part of the government's effort to implement **smart agriculture systems** and combat climate change.
- It helps **minimize the environmental footprint** by preventing the loss of nutrients in the form of leaching and gaseous emissions.
- It reduces the demand for traditional urea as it passes through the cell wall and stomata of plants.
- It can help achieve the UN SDGs as it contributed to improved soil, water, and air quality.
- It is cheaper than conventional urea which leads to an increase in the revenues of farmers and helps achieve the Union Government's goal of doubling farmers' income.
- The use of liquid nano urea can improve crop productivity and soil health.
- The country's import bill and subsidy burden are both expected to reduce as a result of the increased application of liquid nano urea.

Reports on Liquid nano urea

- The first trial of liquid nano urea was conducted during the tenure of the former Director General of the Department of Agricultural Research and Education (DARE), Trilochan Mohapatra, who claimed that the trial did not show any effects on agricultural yield but the use of urea in standing crops dropped by 50%.
- According to Mr. Mohapatra, it was not possible to precisely state where and how the crop is stimulated by liquid nano urea.

- A report titled "Nano-Fertilisers for Sustainable Crop Production and Maintaining Soil Health. " Parliamentary Standing Committee on Chemicals and Fertilizers, chaired by Shashi Tharoor, released in March 2023 stated that **nano urea could reduce the burden of conventional subsidized urea by 50% and lead to an increase of 8% in the yield.**

What are the reported outcomes of using Liquid nano urea?

- It has been **alleged that benefits from the use of liquid nano urea are unlikely to reduce the dependence on packaged urea, as ground visits have shown no visible benefits of the use of liquid nano fertilizer on crops.**
- According to farmers who experimented with liquid nano urea in their wheat fields, conventional urea caused the crops to change color and the leaves to grow, but no changes were seen in fields where liquid nano urea was used.
- As a result, farmers who used liquid nano urea had to spend more to use conventional urea in the fields where liquid nano urea was used.
- They expressed concern that they would have suffered a huge loss in yield if traditional urea was not applied to the standing crop on time.
- Most farmers who faced losses (30-40%) due to untimely rains were reported to be hesitant to use liquid nano urea as it was **expensive but not showing any results.**
- A scientist associated with the Krishi Vigyan Kendra reported no change when nano urea was implemented in his fields while scientists of the ICAR stated that one should be thankful, the product did not have any negative impact on the crops.

## How Are Nutrients In Millets Affected By Processing And Polishing?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Geography

Prepp Mains Booster: Major crops-cropping patterns in various parts of the country; Food processing, Food Security, Agriculture

Context:

- The U.N. Food and Agriculture Organisation (FAO) has declared 2023 to be the '**International Year of Millets', to spread awareness about millets** — a more affordable, sustainable, and nutritious alternative.
- The promotion of millets aligns with **Sustainable Development Goals (SDGs)** such as zero hunger, good health and well-being, decent work and economic growth, responsible consumption and production, climate action and life on land

Types of Millets in India
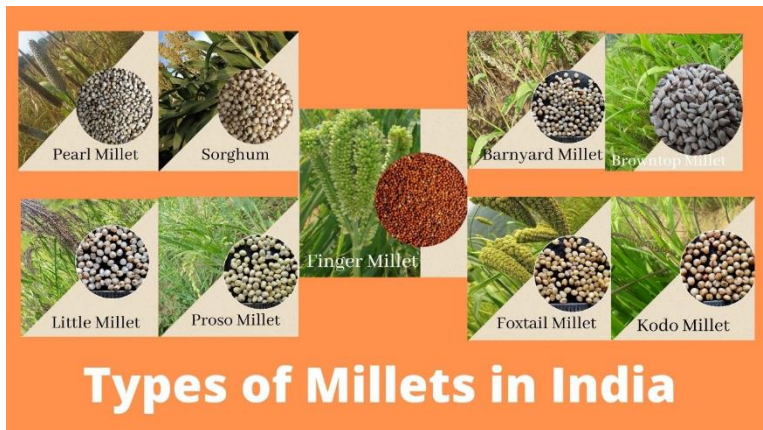
What are millets?

- Millets are fundamentally **grasses cultivated worldwide**, especially in the tropical parts of Africa and Asia, as cereal crops.
- **Examples:** Pearl millet (Cenchrus americanus), Barnyard millet (Echinochloa utilis), Finger millet (Eleusine coracana), and Foxtail millet (Setaria italica).
- The palaeontological (Palaeontology is the study of fossils and the evolution of life on Earth) and textual evidence indicates that millets were being cultivated in the Indian subcontinent five millennia ago.
- According to the **Agricultural and Processed Foods Development Authority,** India is the world's largest producer of millet.
- In 2021-2022, India accounted for 40.51% of the world's pearl millet production and 8.09% of sorghum.
- Within India, pearl millet made up 60% of all the millet production, sorghum 27%, and ragi 11%.
- Sorghum (Sorghum bicolor), adlay millet (Coix lacryma-jobi), and teff (Eragrostis tef) – among others – are some grasses that differ in some respects from the millets but are grouped together with them.

How does processing affect the nutrients?

- **Removal of Husk:** The husk of the grains is removed because it contains cellulosic material that the body cannot digest. However, at least one study discovered that pearl millets' **phytic acid and polyphenol concentrations** decrease when husk is removed.
- **Decortication of grain:** Decortication of the grain, means removal of any other outer covering and exposing the seed.
- Both mechanical and hand-worked decortication removed **crude and dietary fibre.**
- However, decortication makes the **grain more edible and visually attractive** – favorable factors in marketing in urban centers.
- **Milling:** Milling is the process of cleaning, tempering, and grinding cereal grains into flour and other milled grain products.
- In milling, the grains is converted into flour, and sieved to remove large 'impurities', including bran.
- However, according to a 2012 study of finger millet, whole flour had a high content of "total polyphenols and flavonoids" – while sieving made the flour more digestible and its nutrients more accessible to the **body but reduced nutrient content due to the loss of bran.**
- According to the February 2022 study, **germination and fermentation** – in which the **grains are soaked in water for an extended duration** – "showed a positive improvement in the overall nutritional characteristics of millets"

What are the benefits of millet?

- **Food security:** Millets are gaining more popularity in India because of their low input requirements and high nutritional density, both of which are valuable food security.
- **Climate resilient:** Millets are **resilient to harsh weather conditions** and are able to **withstand resource shortage**s. They are **drought resistant,** have a **low**

moisture requirement and can thrive in hot climates, and are well-suited to grow in loamy soil.
- Though they don't thrive **in water-logged or extremely dry soil**, they are better than crops like rice and maize in drought-like conditions, which are expected to become more prevalent in various parts of the world, including the emerging concern of **"flash droughts."**
  o A flash drought is a rapid onset or intensification of drought.
- Millets respond **positively to higher moisture and nutrient content** in the soil.
- According to the **M.S. Swaminathan Research Foundation**, millets also "thrive on marginal land in upland and hilly regions";
  o Marginal land is land whose rent is higher than the value of crops that can be cultivated there.
- **Nutritional content:** The nutritional content of millet includes carbohydrates, proteins, fibre, amino acids, and various minerals.
- Different millet varieties have different nutrient profiles.
  o For instance, pearl millet – one of the oldest cultivated varieties has been found to have higher protein content than rice, maize, and sorghum, while being comparable to that of barley.
  o Foxtail millet is rich in the amino acid lysine;
  o Finger millet has more crude fiber than wheat and rice;
  o Proso millet has a significant amount of the amino acids leucine, isoleucine, and methionine; and
- Millets have been found to be important sources of **micronutrients and phytochemicals.**

Issues:
- **Processing of Millets:** Millets are great for health, but we need to ensure we don't polish all the nutrients out of them.
- **Polishing:** The amount of protein, fat, and fibre removed from the grains increased with the milling time.
- A 2012 study found that there was no nutritional loss while polishing barnyard millet with a rice polisher for up to three minutes.
  o Polishing is the process whereby brown rice, for example, is changed to white rice by rubbing off the bran and the germ.
  o Rice polishing is considered desirable because, per a 2009 study, most consumers favor the resulting **taste and texture and prefer the shorter cooking time; and retailers want longer shelf-life**, which can be achieved by removing the bran.

Conclusion
- Millets can play an important role and contribute to our collective efforts to empower smallholder farmers, achieve sustainable development, eliminate hunger, adapt to climate change, promote biodiversity, and transform agri-food systems

India's efforts to promote millet

- The Union government promoted millets under the **Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP)**, as a sub-scheme of Rashtriya Krishi Vikas Yojana (RKVY) between 2011 and 2014.\
- The Union government declared **2018 as the 'national year of millets'** to trigger an increase in demand.
- In 2021, the Centre approved the **Pradhan Mantri Poshan Shakti Nirman (PM POSHAN)**, earlier known as the mid-day meal scheme, in government and government-aided schools and advised State governments to include millets in the midday meal menu to enhance the nutritional outcome.
- The Union Ministries, **States and Indian embassies have been allocated a 'focused month'** each in 2023 to promote the millet.

What Is The EU's Artificial Intelligence Act And How Does It Plan To Rein In Tech Like ChatGPT?

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Science and Technology

Prepp Mains Booster: Science and Technology- developments and their applications and effects in everyday life;Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Context:
- Recently, a preliminary deal was agreed upon by members of the European Parliament on the new draft of the Artificial Intelligence Act following negotiations on how to include general-purpose artificial intelligence systems like ChatGPT under the ambit of the regulation.
- The Act defines AI and adopts a classification approach based on the risk AI tech poses to the health and safety or fundamental rights of a person.
- The U.S.A. recently released a Blueprint for the Bill of Rights for AI while China enacted a law to regulate recommendation algorithms with a focus on how they disseminate information.
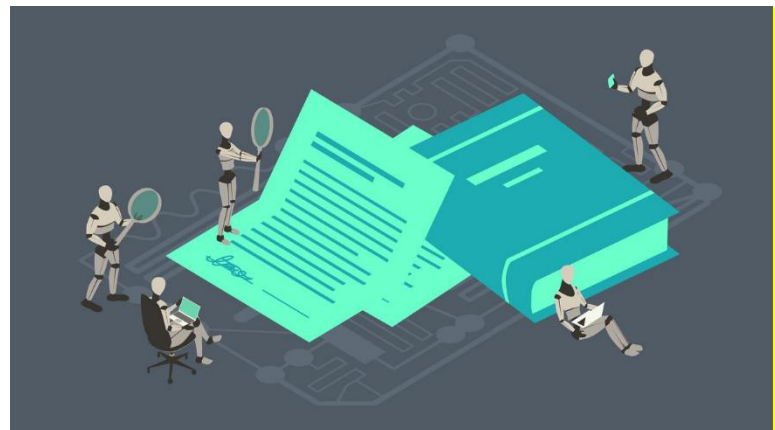
What is the Artificial Intelligence Act?

- **Members of the European Parliament** agreed on a preliminary deal on a new draft of the **Artificial Intelligence Act** following negotiations on including **general-purpose artificial intelligence systems (GPAIS)** under the ambit of the Act.
- The **Act defines AI as software developed with techniques that can generate outputs, recommendations, predictions, and decisions influencing the environments they interact with for a set of human-defined objectives.**
- It also identifies AI tools based on machine learning, deep learning, knowledge, statistical, and knowledge-based approaches.
- The **Act aims to classify AI based on the level of risk they pose to the health, safety, and fundamental rights of a person.**
- **The Act mentions four risk categories - unacceptable, high, limited, and minimal.**
- The Act prohibited the use of AI technology in the unacceptable category with very few exceptions.
- These include the real-time face and biometric identification systems in public, systems of social scoring of citizens by the government that lead to unjustified, detrimental, and discriminatory treatment of citizens as in China, behavior-distorting subliminal techniques, and tech that exploits the vulnerabilities of the old, young, and physically disadvantaged.
- It focuses on AI in the high-risk category and prescribes pre-market and post-market requirements for developers and users.
- AI systems falling under this category include biometric identification and categorization of natural persons, AI tech in health, law enforcement, justice delivery, education, and employment, and tools that provide access to essential private and public services.
- The Act aims to establish an **EU-wide database of high-risk AI systems and setting parameters** so that future technologies which meet the prescribed criteria can be included.
- **AI systems will be subject to risk reviews, called conformity assessments by the Act, before they can enter the market**. These are algorithmic impact assessments that analyze data sets, biases, user's interactions with the system, and the overall design and monitoring of system output.
- The Act requires such AI systems to be transparent, explainable, and allow human oversight.
- Since AI systems are designed to evolve over time, high-risk systems are required to comply with mandatory post-market monitoring obligations including logging performance data and maintaining continuous compliance focused on how the AI tech evolves over time.
- AI systems in the minimal and limited risk categories including video game and spam filters can be used with few requirements such as transparency obligations.
- The regulatory framework proposal of the EU has a future-proof approach, allowing rules to adapt to technological change as AI tools are a fast-evolving technology.
- Standard-setting bodies of the grouping in each sector will have regulatory parameters for high-risk AI tech which will have to be followed by new and emerging technologies.

What is the intent behind the Act?

- The AI Act was first drafted in 2021 in order to bring **transparency, trust, and accountability to AI and create a framework to mitigate the risks to the safety, health, fundamental rights, and democratic values** of the EU and its people.
- It also aims to address the ethical challenges and implementation problems faced in sectors such as health, finance, education, and energy.
- The legislation seeks to establish a balance between adopting AI technology and mitigating the harms associated with certain uses of the technology.
- The AI Act aims to strengthen the EU's position as a global hub of excellence in AI from the lab to the market, similar to how the **General Data Protection Regulation (2018)** made the EU the global leader in global data protection, and ensure that AI in Europe complied with the bloc's values and norms.
- The law aimed to facilitate a single market for AI applications in Europe as an alternative to the U.S.A.

Why is AI regulation necessary?

- AI technology has become omnipresent with advanced algorithms capable of performing tasks such as voice assistance, music recommendations, driving, cancer detection, etc but the associated risks and uncertainties have also risen.
- AI tools are black boxes, meaning designers themselves are not able to explain how they generate a particular output.
- The use of complex and unexplainable AI applications has resulted in wrongful arrests based on faulty AI-enabled facial recognition, and discrimination and societal biases in AI outputs.
- Chatbots based on large language models (LLMs) like **Generative Pretrained Trasformer-3 (GPT-3) and 4** can generate versatile, human-competitive, and genuine-looking content, but they may be inaccurate and use copyrighted material.
- Industry leaders and tech experts Elon Musk and Steve Wozniak recently signed an open letter to AI labs asking them to halt the training of AI models more powerful than GPT-4 for a six-month period as they posed potential human and societal risks.

- The letter recommended that powerful AI systems should be developed only once it is sure that their effects will be positive and risks manageable while urging global policymakers to hasten the development of robust AI governance systems.
- EU lawmakers urged world leaders to organize a summit to brainstorm solutions to regulate the development of advanced AI systems such as ChatGPT.

What were the proposals on GPAIS?

- The initial drafts of the EU's AI bill did not include provisions for regulating GPAIS like the language model-based ChatGPT which was used to summarise concepts, create poems, and news reports, and even deliver a judgment by a Colombian Court while the original Bill only included a mention of the term "chatbot".
- The explosion of interest in generative AI following the unveiling of ChatGPT by OpenAI six months ago has necessitated the need for regulation of the sector.
- Generative AI tools such as OpenAI's ChatGPT or image generator Midjourney train themselves from large sets of text and visual data on the internet, thus using copyrighted materials often.
- These AI techs will now have to be **transparent and disclose copyrighted material used to develop their systems**, although some lawmakers initially proposed banning the use of copyrighted material altogether.
- The current draft of the Bill does not clarify the obligations of GPAIS manufacturers as lawmakers are also debating whether all forms of GPAIS will be categorized as high-risk.
- It is possible that the draft could be amended multiple times before it comes into force as it would require the consensus of all members and all three EU administrative bodies, i.e. the Parliament, Council, and Commission.

How has the industry reacted?

- The reaction to the proposed legislation has been mixed with some industry leaders welcoming it while others have warned that such broad and strict rules could hamper innovation.
- Concerns about transparency requirements have also been raised by some private firms fearing that it could lead to divulging trade secrets.
- Explainability requirements in the law have unsettled AI enterprises as developers were also incapable of explaining the functioning of algorithms in some instances.
- Lawmakers and consumer groups have criticized the draft for not fully addressing risks from AI systems.
- Provisions of the Act also delegate the standardization or creation of precise technical requirements for AI to the EU's expert standard-setting bodies.
- A paper by the Carnegie Endowment points out that the standards process has been industry-driven over the

course of history and that it will be a challenge to ensure governments and the public can contribute meaningfully.

What is the present position of global AI governance?

- Rapid evolutions in AI development have led to conflicting global views on its regulation.
- The U.S.A., which does have comprehensive regulation focused on AI at present, has through the **White House Office of Science and Technology Policy (OSTP) released a Blueprint for an AI Bill of Rights (AIBoR)**.
- The AIBoR highlights the harms caused by AI to economic and civil rights and lays down five principles to mitigate them.
- The Blueprint adopts a sector-specific approach to AI governance including interventions in sectors such as health, labor, and education with sectoral federal agencies empowered to develop relevant strategies.
- The **AIBoR has been described as a non-enforceable legislation based on non-binding and non-regulatory principles.**
- In 2022, China released nationally binding regulations targeting specific algorithms and AI tools and enacted a law focused on information dissemination that aims to regulate recommendation algorithms.
- The Cyberspace Administration of China (CAC), which drafted the rules stated that they were intended to promote positive energy and not endanger national security or public interest and to explain when they harm the legitimate interests of users.
- Observers have claimed that the new rules represent a way of making AI tech companies follow the ruling Communist Party's line.
- Another piece of legislation introduced in China targets deep synthesis technology which is used to generate deep fakes.
- The **Chinese AI regulation authority has created a registry or database of algorithms where developers have to register their algorithms, information about the data sets used, and potential security risks** in order to have transparency and understand how algorithms function.

Russia And Iran Sign Deal For Railway Corridor Intended to Rival Suez Canal

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: NSTC
Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests

Context:

- Recently, **Russian President Vladimir Putin and his Iranian counterpart Ebrahim Raisi signed a pact to finance and develop an Iranian railway** line as part of an emerging international **North-South Transport Corridor.**

o The **agreement was signed in a virtual ceremony** attended by the Presidents of both countries.

Background

- **Russia and Iran have been pushed to strengthen their political and economic ties by Western economic** sanctions on each, which both say are unjustified.
- **Since the 1979 Islamic Revolution** that swept U.S.-backed Shah Mohammad Reza Pahlavi from power, Iran has been ostracized by the West and its economy crippled by a myriad of sanctions.
- o It holds around a quarter of the Middle East's oil reserves.
- The West also imposed another set of restrictions over Iran's nuclear program, while Russia was sanctioned due to its actions in Ukraine.
- According to the terms of the deal, **Russia will contribute 1.6 billion euros in the building of the railway route.**
- o This **investment demonstrates Russia's commitment to expanding its cooperation with Iran** and supporting the development of critical transportation infrastructure.
- The Rasht-Astara railway will be critical in enabling transportation between Iran and Russia, as well as other countries along the INSTC.

About Rasht-Astara Railway

- **Rasht-Astara railway** is seen as an important link in the corridor, meant to connect India, Iran, Russia, Azerbaijan and other countries via railways and sea.
- The unique North-South transport corridor, of which the Rasht-Astara railway will be a part, will assist to greatly diversify global traffic patterns.
- The 162 km (100 mile) railway along the Caspian Sea coast would help connect Russian ports on the Baltic Sea with Iranian ports on the Indian Ocean and Gulf.
- This deal is a major and strategic step forward in Tehran and Moscow's relationship.

The Suez Canal
- It is a constructed sea-level canal that runs north to south through Egypt's Isthmus of Suez to connect the Mediterranean Sea with the Red Sea.
- The canal connects the African continent to Asia and provides the shortest marine route between Europe and the regions around the Indian and Western Pacific seas.
- It is one of the busiest maritime and most significant waterways in the world.

International North-South Transport Corridor (INSTC)
- It is a multimodal transportation route that connects the Indian Ocean and the Persian Gulf to the Caspian Sea via Iran and then to northern Europe via St. Petersburg, Russia.
- INSTC is India's goal and endeavor to decrease the time it takes for EXIM exports to reach Russia, Europe, and Central Asian markets.

North South Transport Corridor (NSTC)

What is the significance of the deal?

- The new rail line will make a significant contribution to global food security.
- The new INSTC route will be used, among other things, to deliver food and other agro-industrial complex goods to Iranian customers as well as nations in the Persian Gulf and Africa.
- To shield commercial flows from geopolitical ramifications, the North-South route will become a more secure and less expensive alternative to the Suez Canal.
- Existing transportation infrastructure has generally been concentrated on the East-West link, but new routes are gaining significance as global markets shift toward China, South-East Asia, and the Persian Gulf.

Conclusion

The signing of the deal demonstrates Iran and Russia's commitment to greater economic relations and regional integration. The INSTC is a significant transit corridor that aspires to connect the Indian Ocean and the Persian Gulf to the Caspian Sea via Iran, Russia, and other nations in the region. It is envisioned as a critical commerce and transit corridor, providing a shorter and more efficient route for commodities to reach Europe, Central Asia, and beyond.

Kilo-Class Submarine INS Sindhuratna Reaches India After Major Refit In Russia

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Defence
Prepp Mains Booster: Security challenges; Various Security forces and agencies and their mandate.

Context:

- The **Navy's Kilo-class submarine INS Sindhuratna** which underwent a **Medium Refit Life Certification (MRLC) process** in Russia reached Mumbai after sailing for 97 days and almost 10,000 miles with **two port calls (**Le Havre, France and Cadiz, Spain**)** in between.
- It faced transportation issues due to sanctions in the backdrop of the war in Ukraine

- The submarine faced a challenging return voyage, crossing the Norwegian Sea, English Channel, and the Mediterranean Sea, and finally reached Mumbai on 16th May.

Why are the Submarines being refitted?

- With delays in induction of submarines, the ageing SSKs - 209s (German HDWs) and EKMs (Russian Kilos) are being put through the MRLC process **which will extend their life by 10 to 15 years and** also the force levels do not decline drastically.
- INS Sindhuratna had gone for an **upgrade in Severodvinsk** after a major accident in **February 2014 that killed two officers**.

Kilo-Class Submarine INS Sindhuratna

- INS Sindhuratna is a **Russian Type 877EKM diesel-electric submarine** also popularly called a **NATO-defined Kilo-class sub.**
- INS Sindhuratna, **a Sindhughosh class submarine**, returned to Mumbai after undergoing a major refit at a Naval dockyard in Russia.
- The Kilo-class submarines have a displacement of 2,300 tonnes, a maximum diving depth of 300 metres and a top speed of 18 knots. They are able to operate solo for 45 days with a crew of over 50.

Concerns

- **Depleting submarine fleet:** India currently possesses 15 conventional diesel-electric submarines, classified as SSKs, however many of its SSK submarines require mid-life upgradation.
- The fleet includes **seven Kilo-class, four French Scorpene submarines, four German HDW submarines**, and the indigenous nuclear ballistic missile submarine INS Arihant.
- Of the 10 Kilo-class submarines originally procured from Russia:
  o Sindhurakshak was lost in an accident,
  o Sindhuvir was transferred to Myanmar and
  o Sindhudhvaj was decommissioned in July 2022 after 35 years.
  o Another Kilo-class submarine INS Sindhukirtiis currently at Hindustan Shipyard Ltd., Visakhapatnam for normal refit of 22 months.

- Eight of the Indian Navy's diesel-electric submarines are Kilo-class or Sindhughosh-class submarines sourced from Russia and the former USSR between 1984 and 2000.
- Among these submarines, the INS Sindhuratna **is one of the oldest Kilo-class submarines in the fleet.**
- Under Project 75, the Indian Navy has commissioned five out of six Scorpene submarines of the INS Kalvari class, with the sixth one being constructed by Mazagon Docks (MDL). However, even with the completion of the Scorpene submarines, the total submarine count will remain at 17.
- **Military challenge from China:** The Chinese footprint in the Indian Ocean Region (IOR) is steadily increasing. Beijing acquired a military base at Djibouti in the Horn of Africa in 2017 and is heavily invested in ports in Pakistan and Sri Lanka.
- The ambitious Project 75 (India) for building another six submarines is yet to take off **under the strategic partnership model.**

Conclusion

- The rising incidents of Chinese Navy incursions in the Indian Ocean and its breach of international rules of the sea in the South China Sea is a matter of concern for the Indian navy.
- The Indian Navy is tasked to secure maritime routes as well as marine trade, and hence it has an urgent need for a stronger submarine fleet.

What is Project 75 India (P-75I)?

- The P75I project is part of a **30-year submarine-building plan** that ends in 2030.
- As part of this plan, India was to build 24 submarines — 18 conventional submarines and six nuclear-powered submarines (SSNs) — as an effective deterrent against China and Pakistan.
- It is a follow-on project of the P-75 class (Scorpion Class) submarines of the Indian Navy.
- Project-75(I) envisages the indigenous construction of **six modern conventional submarines (including associated shore support,** Engineering Support Package, training, and spares package) with contemporary equipment, weapons & sensors including Fuel-Cell based AIP (Air Independent Propulsion Plant), advanced torpedoes, modern missiles and state of the art countermeasure systems.

Significance

- It would provide a **major boost to the indigenous design and construction** capability of submarines in India, in addition to bringing in the latest submarine design and technologies as part of the project.
- The project would not only aid in boosting the core submarine/shipbuilding industry but would also greatly **enhance the manufacturing/industrial sector,** especially the MSME by developing an industrial eco-

- system for the manufacture of associated spares/systems/equipment related to submarines.
- The overall **aim would be to progressively build indigenous capabilities** in the public/private sector to design, develop and manufacture complex weapon systems for the future needs of the Armed Forces.
- It will be an important step towards meeting broader national objectives, encouraging self-reliance, and aligning the defense sector with the 'Make in India' initiative of the Government.

India Host of 44th Edition Of Annual ISO COPOLCO Plenary From 23-26th May

Priority: Medium

Primary Source: PIB

Prepp Prelims Booster: COPLCO

Prepp Mains Booster: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests; Prelims - Current events of national and international importance

Context:

- India is hosted the **44th edition of the annual International Organization for Standardization (ISO) Committee on Consumer Policy (COPOLCO)** Plenary from 23 to 26 of Maymonth.
- The mega event is being organized by the **Bureau of Indian Standards (BIS)**, the national standards body of India
- Consumer Affairs, Food, and Public Distribution Minister Piyush Goyal will inaugurate the four-day event in **New Delhi.**
- **The theme** for the plenary this year is Challenges and Good Practices for Consumer Engagement, Empowering Consumers for a Sustainable Future, Consumer Protection, and Legal Frameworks.

ISO (International Organization for Standardization)

- ISO (International Organization for Standardization) is an independent, **non-governmental international organization** with a membership of 168 national standards bodies.
- ISO COPOLCO, or the Committee on Consumer Policy, is a committee of the ISO responsible for promoting consumer interests in the **standardization process and for ensuring that standards** are developed with the needs of consumers in mind.
- The organization's headquarters are in Geneva, Switzerland.
- ISO standards provide a strong basis for the development of national and international regulation, helping save time and reduce barriers to international trade.
- ISO Standards help businesses of any size and sector reduce costs, increase productivity and access new markets.

Bureau of Indian Standards (BIS)

- Bureau of Indian Standards (BIS) is the **National Standard Body of India established under the BIS Act 2016** for the harmonious development of the activities of standardization, marking, and quality certification of goods and for matters connected therewith or incidental thereto.
- BIS has its **headquarters in New Delhi**
- BIS has been providing traceability and tangibility benefits to the national economy in a number of ways – providing safe reliable quality goods; minimizing health hazards to consumers; promoting exports and imports substitute; control over proliferation of varieties etc. through standardization, certification and testing.
- BIS **is a member of the International Organization for Standardization (ISO)** and through the Indian National Committee (INC) is a member of the International Electro technical Commission (IEC).
- BIS is also a member of regional standards bodies like the Pacific Area Standards Congress (PASC), and the South Asian Regional Standards Organization (SARSO) and is under the framework of IBSA (India, Brazil and South Africa).

BIS is involved in various activities as given below:

- **Standards Formulation**
- **Product Certification Scheme**
- Compulsory Registration Scheme
- **Foreign Manufacturers Certification Scheme**
- **Hall Marking Scheme**
- Laboratory Services
- Laboratory Recognition Scheme
- **Sale of Indian Standards**
- Consumer Affairs Activities
- Promotional Activities
- Training Services, National & International level
- Information Services

What Are The Gaps In The AePS Transaction Model?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Aadhaar-enabled Payment System(AePS)
Prepp Mains Booster: Government Policies & Interventions

Context:
- Recently, **a person's account was drained using an Aadhaar-linked fingerprint without needing two-factor authentication.**
- The **Aadhaar-enabled Payment System(AePS) is a bank led model which allows online financial transactions at Point-of-Sale (PoS)** devices and micro ATMs of any bank using Aadhaar authentication.
  - **Cyber criminals are now using silicone thumbs to operate biometric PoS devices and biometric ATMs to drain users bank accounts**.

What is AePS?
- **Aadhaar-enabled Payment Services (AePS)** is a bank-led concept that permits online financial transactions at **Point-of-Sale (PoS) and Micro ATMs via any bank's business correspondent using Aadhaar identification.**
- The **National Payments Corporation of India (NPCI) created AePS** to serve a variety of purposes for persons and organizations involved in the financial and banking systems.
  - **Aadhaar is a 12-digit unique identifying number** provided by the Indian government to Indian citizens.

Objective of AePS
- To enable a bank customer to use Aadhaar as his/her identity to access his/her respective Aadhaar-enabled bank account and perform basic banking transactions such as cash deposit, cash withdrawal, intrabank or interbank fund transfer, balance enquiry, and obtaining a mini statement via a Business Correspondent.
- To help the Government of India (GoI) and the Reserve Bank of India (RBI) achieve their aim of increasing financial inclusion.
- To help the RBI achieve its aim of electronic retail payments.
- To let banks to route interbank transactions originated by Aadhaar through a central switching and clearing agency.
- To enable the payout of government entitlements like as NREGA, Social Security pension, Handicapped Old Age Pension, etc, by any Central or State Government body, utilizing Aadhaar and verification as provided by UIDAI.
- To facilitate interoperability across banks in a safe and secured manner.
- To build the foundation for a full range of Aadhaar enabled Banking services.

About National Payments Corporation of India (NPCI)
- It is an umbrella organization for operating retail payments and settlement systems in India.
- It is an initiative of the Reserve Bank of India (RBI) and Indian Banks' Association (IBA) under the provisions of the Payment and Settlement Systems Act, 2007.
- It has been incorporated as a "Not for Profit" Company under the provisions of Section 25 of Companies Act 1956 (now Section 8 of Companies Act 2013).
- The ten core promoter banks are State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda, Union Bank of India, Bank of India, ICICI Bank, HDFC Bank, Citibank and HSBC.
- In 2016 the shareholding was broad-based to 56 member banks to include more banks representing all sectors.

Issues with the model
- The **model eliminates the need for OTPs, bank account information, and other financial details.**
- It permits financial transfers using simply the bank name, Aadhaar number, and fingerprint acquired during Aadhaar enrollment.
  - These are the sole inputs necessary for specific sorts of transactions, such as cash deposit, cash withdrawal, balance enquiry, mini statement, Aadhaar to Aadhaar fund transfer, authentication, and BHIM Aadhaar pay.

How are cybercriminals using Aadhar for financial fraud?
- Aadhaar numbers are widely available as photocopies and soft copies, and criminals are using Aadhaar-enabled payment systems to steal customer data.
- Scammers have used silicone in the past to mislead devices into beginning transactions.

- Cybercriminals have now taken to using silicone thumbs to operate biometric POS devices and biometric ATMs to drain users' bank accounts.
- They allegedly misuse fingerprints to authenticate Aadhaar biometrics and withdraw money from the victim's bank account.
  o In June 2022, a group of hackers was caught in Hyderabad for illegally withdrawing Rs.14.64 lakh from 149 clients by downloading documents from the official website of the Andhra Pradesh Registration and Stamps Department. Authorities seized 2,500 duplicated fingerprints, as well as pen drives and other devices used in the scheme.

What measures are being taken?

- **Amendment to the Aadhaar Regulations, 2016:** The UIDAI is proposing an amendment to the Aadhaar (Sharing of Information) Regulations, 2016, which will require entities in possession of an Aadhaar number not to share details unless the Aadhaar numbers have been redacted or blacked out using appropriate means, both in print and electronic form.
- **Two-factor authentication:** The UIDAI has also deployed a new two-factor authentication technique that uses a machine-learning-based security approach that combines finger minutiae and finger picture capture to determine the liveness of a fingerprint.
- **Locking Aadhaar data:** Users have been instructed to secure their Aadhaar information by visiting the UIDAI website or using the mobile app. This ensures that their biometric information, even if hacked, cannot be used to begin financial activities. Aadhaar may be opened when biometric authentication is required, such as for property registration or passport renewals, and then locked again.

What Are RBI Regulations On Green Deposits?

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Green Deposits

Prepp Mains Booster: Biodiversity and Environment

Context:

- Recently, the **Reserve Bank of India (RBI) came up with a regulatory framework for banks to accept green deposits from customers.**
  o Under the new framework, banks that accept green deposits will have to disclose more information on how they invest these deposits.

What are Green Deposits?

- Green deposits refer to financial deposits that are specifically designated for environmentally sustainable or socially responsible purposes.
- These deposits are typically offered by banks and financial institutions as a means for individuals and businesses to invest their money in projects and activities that have positive environmental or social impacts.
- Green deposits are similar to the conventional deposits that banks collect from their customers. The only significant distinction is that banks agree to put the money they receive as green deposits towards environmentally good projects.
  o For example, a bank may pledge that green deposits would be utilized to fund renewable energy initiatives that combat climate change.
- A green deposit is one of several financial instruments, such as green bonds, that allow investors to participate in ecologically beneficial initiatives.

What does the RBI's regulatory framework say?

- The RBI's framework for accepting green deposits specifies specific standards that banks must meet in order to accept green deposits from customers.
- Banks will be required to develop a set of guidelines or policies that have been authorized by their separate boards and must be followed when investing green deposits from clients.
- These requirements must be made public on banks' websites, and banks must report frequent information regarding the quantity of green deposits received, how these deposits were distributed to various green initiatives, and the environmental effect of such investments.
- A third party will be required to verify the statements made by banks on the projects in which the banks invest their green deposits, as well as the sustainability credentials of these business enterprises.

Sectors eligible for Green Deposits

- The Reserve Bank of India has developed a list of sectors that can be designated as sustainable and so eligible for green deposits.
- Renewable energy, waste management, clean transportation, energy efficiency, and afforestation are examples of these.

- Banks will be prohibited from investing in green deposits in projects including fossil fuels, nuclear power, tobacco, and so forth.
- The new laws are intended to avoid greenwashing, which refers to making false claims about an activity's positive environmental impact.
  o For example, a bank may claim that their green deposits will have a big beneficial influence on the environment, even if the impact is negligible.

Features of Green Deposits Framework

- **Applicability**: The **framework applies to Scheduled Commercial Banks, including Small Finance Banks, except Regional Rural Banks, Local Area Banks, and Payments Banks,** and all deposit-taking Non-Banking Financial Companies (NBFCs), including Housing Finance Companies.
- **Allocation**: REs will be required to direct the proceeds of green deposits toward a list of green activities and projects that promote energy efficiency in resource utilization, reduce carbon emissions and greenhouse gases, promote climate resilience and/or adaptation, and improve natural ecosystems and biodiversity.
- **Exclusion:** Projects involving new or existing fossil fuel extraction, production, and distribution, including improvements and upgrades, nuclear power, direct waste incineration, alcohol, weapons, tobacco, gaming, or palm oil industries, renewable energy projects generating energy from biomass using feedstock originating in protected areas, landfill projects, and hydropower plants larger than 25 MW have been excluded from green financing.
- **Framework for Funding:** To guarantee successful distribution of green deposits, REs must use a Board-approved Financing Framework (FF). **Green deposits shall only be denominated in Indian rupees.** The allocation of monies collected through green deposits by REs during a fiscal year must be subject to independent third-party verification/assurance on an annual basis.

Purpose of Green Deposits

- Climate change has been identified as one of the most pressing concerns, and numerous attempts have been made internationally to minimize emissions while also promoting sustainability.
- The financial sector may play a critical role in mobilizing resources and allocating them to green activities/projects. Green finance is also progressively gaining traction in India.
- Some Regulated Entities (REs) are already issuing green deposits to fund green activities and projects.
- The framework's aim and reasoning is to encourage REs to offer green deposits to customers, protect depositors' interests, assist customers in achieving their sustainability agenda, address greenwashing concerns, and help augment the flow of credit to green activities/projects.

- The initiatives must enhance resource efficiency, reduce carbon emissions and greenhouse gas emissions, boost climate resilience and/or adaptation, and appreciate and improve natural ecosystems and biodiversity.
- Renewable energy, energy efficiency, clean transportation, climate change adaptation, sustainable water and waste management, and green buildings are among the projects/activities to which the income from green deposits might be allocated.

What distinguishes them from ordinary deposits?

- The deployment of money is the key distinction between green deposits and ordinary deposits.
- Green deposits, unlike conventional deposits, are set aside particularly for green funding. This guarantees that depositors' funds are directed toward ecologically beneficial initiatives.
- Aside from that, all of the regulations that apply to ordinary deposits will apply to green deposits. Depositors have the option to redeem or carry forward their deposits at maturity.

RBI To Pull Out ₹2,000 Notes From Active Circulation

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Current Events of National Importance
Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Context:

- Recently, the **Reserve Bank of India (RBI)** decided to withdraw ₹2,000 denomination banknotes from circulation in pursuance of **its "Clean Note Policy".**
- While the notes will remain legal tender, Indian citizens have been advised to deposit or exchange them by 30 September 2023.
- A similar **withdrawal of notes** from circulation was undertaken in **2013-2014**.

Why are the Rs 2000 denomination banknotes being withdrawn?

- The 2000-rupee notes were introduced in 2016 with the intention to **replenish** the **Indian economy's currency in circulation** quickly after demonetization.
- With fulfillment of that objective and the availability of banknotes in other denominations in adequate quantities, RBI had stopped printing 2000-rupee notes over the past four years.
- Moreover, the Reserve Bank of India has frequently said that it wants to reduce **high-value notes in circulation.**
- **The RBI has observed that this denomination is not commonly used for transactions** and it is in pursuance of the "**Clean Note Policy**". It decided to
withdraw the Rs 2000 denomination banknotes from circulation
- Clean Note Policy is a policy adopted by RBI to ensure the availability of good quality banknotes to the members of the public.

Impact on the economy

- **Currency in circulation:** The **value** of 2000-rupee notes in circulation is Rs 3.62 lakh crore which is about **10.8% of the currency in circulation.**
- It is lower than the 2016 demonetization that had withdrawn **86% of the economy's** currency in **circulation overnight.**
- **Less disruptive:** According to analysts and economists, the move is expected to be less disruptive as **notes** are being withdrawn **over a longer period of time.**
- Moreover, notes of smaller denominations are **available in sufficient quantity**, and in the past 6-7 years, the scope of **digital transactions and e-commerce** has **expanded significantly.**
- **Small businesses:** The small businesses and cash-oriented sectors such as agriculture and construction could see inconvenience in the near term.
- **Temporary Rise in Discretionary Spending:** The withdrawal of 2000-rupee notes could lead to some spurt in discretionary purchases such as gold. This is because people may choose to spend their 2000-rupee notes before they are no longer valid.
- **Improve Liquidity:** It will help to improve banking system liquidity and reduce short-term interest rates. This will make it cheaper for businesses to borrow money and invest, which will help **to boost economic growth.**

What should the public do with the ₹2000 denomination banknotes held by them?

- Members of the public may approach bank branches for deposit and/or exchange of ₹2000 banknotes held by them.
- The facility for deposit into accounts and exchange for ₹2000 banknotes **will be available at all banks and** 19 Regional Offices (ROs) of RBI until September 30, 2023.
- **Deposit into bank accounts** can be made **without restrictions subject to** compliance with extant Know Your

Customer (KYC) norms and other applicable statutory/regulatory requirements.
- Members of the public **can exchange ₹2000 banknote**s upto to a limit of **₹20,000/- at a time.**

Pollution Control Boards Aren't Underfunded But Investing Their Surplus Into Fixed Deposits: Report

Priority: Medium
Primary Source: Down to Earth

Prepp Prelims Booster: Environment
Prepp Mains Booster: - Statutory, regulatory and various quasi-judicial bodies, GS3 - Conservation, environmental pollution and degradation, environmental impact assessment

Context:

- Recently, a report released by the Centre For Policy Research has found that 10 State Pollution Control Boards and Pollution Control Committees had invested their annual surplus in short, medium-term fixed deposits worth ₹2,893 crores as of 31st March 2021.
- Central Government funding to SPCBs is regular but inadequate while funding from state governments is largely non-existent.

What has the CPR report revealed?

- "**The State of India's Pollution Control Boards: Are they in the green?**" was released by the Centre for Policy Research on April 28, 2023, as the fourth part of its "The State of India's Pollution Control Boards" series.
- The report has questioned whether the State Pollution Control Boards (SPCB) and Pollution Control Committees (PCC) are effectively fulfilling their pollution control mandate.
- The report found that **10 pollution control authorities i.e. 9 PCBs and 1 PCC in the Indo-Gangetic Plains had invested their annual surplus in short, medium-term funds worth ₹2,893 crores as of March 31st, 2021**.
- This surplus should have been invested in manpower, infrastructure, and equipment in an ideal scenario.

- The report concluded that SPCBs did not necessarily function effectively despite being funded adequately.
- The authors of the research paper filed RTI applications to seek information on the revenue and expenditure of the nine SPCBs and one PCC for three financial years: 2018-19, 2019-20, and 2020-21.
- The information received was categorized into standard templates based on the format of annual reports.

SPCB
- The **State Pollution Control Boards** were constituted under the **Water (Prevention and Control of Pollution Act) 1974.**
- Its mandate was later expanded to include the **Air(Prevention and Control of Pollution) Act, 1981.**
- The SPCB supplements the Central Pollution Control Board by implementing environmental rules and laws in the state.
- It is a **statutory organization** whose members are nominated by the respective state governments.

PCCs
- The **Pollution Control Committee** performs similar functions to the SPCB.
- The Pollution Control Committees are established in Union Territories.

On Funding of PCBs

- The authors of the CPR report found that a **majority of the Boards examined generated their revenue by issuing no-objection certificates to polluting industries and granting them permits to establish and operate.**
- **Central government funding is regular but inadequate** as it is provided only for existing central sector schemes.
- **Funding from state governments is irregular in comparison with no funding from state governments to SPCBs/PCCs in eight of the ten states examined.**
- According to the research paper, **licensing and consent fees, and the interest garnered from investments are the only methods for revenue generation of the Boards** as they cannot water cesses any longer.
- As a result, the Boards are incentivized to focus on consent management as it is their only regular revenue source.
- According to the report, most Boards struggled to spend all the surplus generated by them over the three years between 2018 and 2021.
- Pay and allowances for staff comprise over half of the expenditure of the Pollution Control Boards with it rising as high as 80% in some PCBS.
- **Spending on new infrastructure such as lab facilities is generally low despite the poor state of infrastructure** across the ten states, with a few exceptions.
- Spending on studies, research, and development comprises a minuscule portion of the overall expenditure of the Boards.

Issues that need to be addressed

- Experts including a former member of the 15th Finance Commission and the head of the Centre for Air Pollution Studies highlighted the **fragmented nature of the governance structure** as a major issue to be addressed.
- According to former leadership and staff of the CPCB and SPCBs, the NGT order empowering PCBs to impose environmental compensation was a necessary replacement for the revenue lost when the water cess was subsumed under the GST regime.

Water cess was levied on water consumed by local authorities and industries to add to the funds available with the CPCB and SPCBs to address water pollution.

- Another criticism noted by experts was that **SPCBs are provided responsibility but no power.** On the other hand, urban local bodies are granted too much power and responsibilities but there is no clear structure under which responsibilities are allocated among the departments.
- They have cited the example of Karnataka, where the ULB thought it had to utilize the fund for clean air. It was only after two-and-a-half years that they realized that the money had to be allocated to the departments responsible for implementing air pollution control measures.
- The State Pollution Control Board has been instrumental in highlighting the concerns of the departments under the **National Clean Air Programme.**
- The PCBs were held responsible as in Karnataka but lacked power due to the inefficient structure.

Way Forward

- The research paper also noted that the amendments proposed to the Air Act and Environment Protection Act as part of the **Jan Vishwas bill** pending in Parliament would significantly improve the regulatory structure.
- If the bill becomes law, adjudicatory powers would be placed in the hands of Central government-appointed bureaucrats and fines would be deposited in the environment protection fund of the Centre.
- These changes were expected to affect the role of the SPCBs in the regulatory framework and their ability to generate revenue from environmental compensation.
- The SPCBs need to be included and ensured of a greater role in a forward-looking regulatory regime that aims to reduce air pollution through modern approaches and airshed level regulation.

India's First Water Body Census

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: Environment
Prepp Mains Booster: Environment

Context:

- Recently, the **Ministry of Jal Shakti has published the report of India's first water bodies census.** It is a comprehensive database of the country's ponds, tanks, lakes, and reservoirs.
- The census was conducted in 2018-19, and it counted over 2.4 million bodies of water across all states and union territories.
- According to the survey, **West Bengal's South 24 Pargana district has the most water bodies (3.55 lakh) in the country.**
  o The district is followed by Andhra Pradesh's Ananthapur (50,537) and West Bengal's Howrah (37,301).

What is a water body?

- **Water bodies are defined as all natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes** (e.g. industrial, pisciculture, domestic/drinking, recreation, religious, groundwater recharge, etc.).
- Water bodies are commonly classified as **tanks, reservoirs, ponds,** etc.
- A water body is also a structure where water is deposited from glacier melt, streams, springs, rain, or drainage of water from residential or other areas, or where water is held by diversion from a stream, nala, or river.

What was the need for a water body census?

- The Centre maintained a database of water bodies that received central assistance under the scheme of Repair, Renovation, and Restoration (RRR) of water bodies, earlier.
- A Standing Committee of Parliament raised the necessity for a separate census of water bodies in 2016.
- In 2018-19, the government commissioned the first census of water bodies, as well as the sixth Minor Irrigation (MI) census.
- The goal was to gather data on all important aspects of the subject, including their size, condition, status of encroachments, use, storage capacity, status of storage filling up, and etc.

MAIN FINDINGS

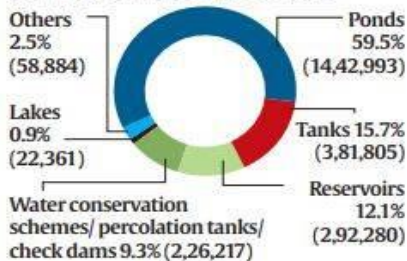**24,24,540** water bodies in India

7.47 lakh West Bengal has largest number

3.55 lakh South 24-Parganas in West Bengal is the district with the most water bodies
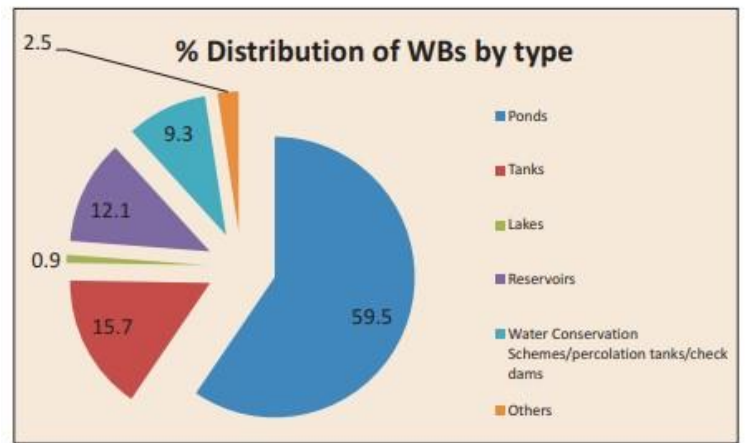
MOST IN THE COUNTRY

Ponds, reservoirs	West Bengal
Tanks	Andhra Pradesh
Lakes	Tamil Nadu
Conservation Schemes	M'rashtra

TYPES OF WATER BODIES

Others 2.5% (58,884)
Ponds 59.5% (14,42,993)
Lakes 0.9% (22,361)
Tanks 15.7% (3,81,805)
Water conservation schemes/ percolation tanks/ check dams 9.3% (2,26,217)
Reservoirs 12.1% (2,92,280)

1 LAKH+ (BESIDES BENGAL)

Uttar Pradesh 2.45 lakh	Assam 1.72 lakh
Andhra Pradesh 1.90 lakh	Jharkhand 1.07 lakh
Odisha 1.81 lakh	Tamil Nadu 1.06 lakh

% Distribution of WBs by type

2.5
9.3
12.1
0.9
15.7
59.5

- Ponds
- Tanks
- Lakes
- Reservoirs
- Water Conservation Schemes/percolation tanks/check dams
- Others

What is the significance of a water body?

- **Ecological:** Water bodies provide homes for a variety of aquatic plants and animals, preserving biodiversity in ecosystems. They also help to regulate water cycles, recharge groundwater, and prevent soil erosion.
- **Cultural:** Water bodies hold cultural and religious significance in many countries. They also provide recreational options such as fishing, swimming, boating, and other leisure activities.
- **Economic:** They play an important role in agriculture by delivering irrigation water to crops. They also assist the fishing sector, which provides a substantial source of income for many towns. Furthermore, water bodies contribute to hydropower generation and are used for industrial and domestic purposes.
- **Climate Change:** Water bodies can help alleviate the effects of climate change by serving as carbon sinks and managing the microclimate in surrounding areas.
- **Disaster Management:** Water bodies can serve as natural buffers against natural calamities such as floods and droughts. They can also assist to alleviate the consequences of water scarcity by offering alternative water sources.

What does the census show about water body encroachment?

- The census discovered that 1.6% of listed water bodies — 38,496 out of 24,24,540, had been encroached upon.
- More than 95% of these were in rural regions, because more than 97% of the water bodies covered by the census were in rural areas.
- In about 63% of encroached water bodies, less than a quarter of the area was under encroachment; in approximately 12% of water bodies, more than three-quarters of the area was under encroachment.
- Uttar Pradesh has about 40% (15,301) of the encroached-on water bodies, followed by Tamil Nadu (8,366) and Andhra Pradesh (3,920).
  o West Bengal, Sikkim, Arunachal Pradesh, and Chandigarh claimed no encroachment on water bodies.

WATERBODY COUNT

STATES WITH MOST WATERBODIES

State	No. of water bodies
West Bengal	7,47,480
Uttar Pradesh	2,45,087
Andhra Pradesh	1,90,777
Odisha	1,81,837
Assam	1,72,492
Jharkhand	1,07,598
Tamil Nadu	1,06,957

STATES/UTs WITH LEAST WATERBODIES		WATERBODIES LOST TO ENCROACHMENTS	
Sikkim	134	Uttar Pradesh	15,301
Chandigarh	188	Tamil Nadu	8,366
Delhi	893	Andhra Pradesh	3,920
Arunachal Pradesh	993		

No encroachment on waterbodies was reported from West Bengal, Sikkim, Arunachal Pradesh and Chandigarh

Government initiatives for water conservation

- **Jal Shakti Abhiyan:** The Jal Shakti Abhiyan is a time-bound, mission-mode campaign aimed at improving water availability and quality. The campaign focuses on five key areas, including water conservation and rainwater harvesting.
- **Atal Bhujal Yojana:** It aims to improve groundwater management in seven states that are facing acute groundwater depletion. The scheme focuses on community participation and aims to incentivize farmers to adopt water-saving practices.
- **National Water Mission:** It is a comprehensive program aimed at conserving water, minimizing wastage, and ensuring equitable distribution of water across the country. The mission focuses on promoting water-use efficiency, increasing water-use efficiency in agriculture, and encouraging the use of recycled water.
- **Pradhan Mantri Krishi Sinchai Yojana:** The Pradhan Mantri Krishi Sinchai Yojana is a flagship program of the government that aims to enhance water-use efficiency in agriculture, improve farm productivity, and ensure better returns to farmers. The scheme focuses on promoting micro-irrigation, water conservation, and watershed development.

Way Forward

- With overall water consumption in India predicted to climb by more than 70% by 2025, a massive demand-supply imbalance is expected in the coming years.
- Poor water quality and a lack of sufficient sanitation are also key causes of disease and poor health. Proper access to drinkable water will reduce health concerns and medical costs.

- Adequate water security might possibly stimulate economic growth by lowering the costs of water infrastructure.
- India can use its G20 presidency to discuss global best practices and ideas on water resource management.

What Did India's First National Water-Body Census Find?

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: National Waterbody Census
Prepp Mains Booster: Conservation

Context:

- In this article, Dr. Veena Srinivasan (Executive Director of the Water, Environment, Land and Livelihoods (WELL) Labs), a new research centre based at the Institute of Financial Management and Research (IFMR) Society and Krea University, has discussed about the findings of the **first ever water body census, conducted by the Ministry of Jal Shakti,** which was published recently.
  - With groundwater reduction and biodiversity loss, as well as climate change increasing the frequency of floods and droughts, **India is facing a water crisis.**

Key Highlights of the Census

- The **Ministry of Jal Shakti has conducted the nation's first-ever census of water bodies.**
- The census offers a thorough assessment of India's water resources, including natural and man-made bodies of water such as ponds and lakes.
- Over 24.24 lakh water bodies have been counted in the country, with more than 23 lakh in rural regions and approximately 69,000 in urban areas.
- **West Bengal, Uttar Pradesh, Andhra Pradesh, Odisha, and Assam have the most water bodies, accounting for around 63% of the total water bodies** in the country.
- The Census also yielded important insights into the country's water resources, including discrepancies between rural and urban areas and varied levels of encroachment.

What is a water body?

- Water bodies are defined as all natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes (e.g. industrial, pisciculture, domestic/drinking, recreation, religious, groundwater recharge, etc.).
- Water bodies are commonly classified as tanks, reservoirs, ponds, etc.
- A water body is also a structure where water is deposited from glacier melt, streams, springs, rain, or drainage of water from residential or other areas, or where water is held by diversion from a stream, nala, or river.
- Water bodies are essential as they act as a weather buffer, storing floodwaters for use during dry spells. They help to

food and water security as well as livelihoods by recharging groundwater and providing water for agriculture and grazing. They are also culturally and environmentally significant.

Why was the census conducted?

- The goal of the census was to create a national database containing data on the size, purpose, ownership, status, and conditions of water bodies.
- It applied to all natural and man-made units bordered on all sides for the purpose of holding water, regardless of condition or usage.
- Data input software and a smartphone app for recording the position and visual of water bodies were developed, and data-processing workshops were held in all states and union territories to teach the trainers.
- The census was based on pre-existing and freely available satellite-derived statistics. This information was also incredibly detailed, allowing citizens to zero in on a single hamlet and get historical time series data for each body of water.
- However, it only contains characteristics that can be seen from space. This is extended by the water body census to include social aspects such as ownership, use, and condition.

What are the issues?

- **Small Water bodies:** The great majority of water bodies in India are smaller than one hectare in size. This implies that discovering and tracking them will continue to be difficult. The typical method of mapping large bodies of water, utilizing satellites, may not work, which is why the massive effort put out in ground-based tracking is much appreciated.
- **Regional patterns:** Water bodies are often larger and publicly held in drier regions like Gujarat, Maharashtra, and Rajasthan. More than three-quarters of the water bodies in the country's wetter regions, such as Kerala, West Bengal, and northeastern provinces, are privately held.
  - In arid states, water sources are largely used for agriculture and groundwater replenishment.
  - Domestic usage and pisciculture are dominant in wetter states.
  - Smaller bodies of water are mostly owned by panchayats.
- **Non-repairment of water bodies:** Several water bodies were classed as "not in use," indicating that, despite current interest in renewing water bodies, most of them have never been mended or resurrected.

Importance of water body census

- The census offers critical data for policymakers to make educated choices about water resource management and conservation.

- It emphasizes the inequalities between rural and urban communities, as well as the necessity for comprehensive measures to avoid invasion.
- The census data may be used as a baseline for future analyses of India's water resources, allowing for the monitoring of changes and progress toward sustainable water management.

Measures to improve the census

- **Improve data collection methods:** The census could benefit from more advanced data collection methods that employ technologies such as remote sensing and GIS to gather more precise and detailed information about water resources.
  - This could help identify areas where water scarcity is more acute, and where measures such as water conservation and rainwater harvesting can be implemented.
- **Collaborate with local communities:** Local communities can provide valuable insights into the water resources in their area, and involving them in data collection efforts could help improve the accuracy and comprehensiveness of the census.
- **Regular updating:** The Water Census should be updated regularly to ensure that the data remains current and relevant. This would help identify trends and changes in water availability and utilization, and enable policymakers to make informed decisions based on the latest information.
- **Increase public awareness:** Increasing public awareness about the importance of water conservation and sustainable use of water resources could help improve the effectiveness of the Water Census by encouraging more people to participate in data collection efforts and take action to address water-related issues in their communities.
- **Standardized data:** Some states like Gujarat don't show any water bodies not being in use, whereas Karnataka reports almost 80% of its water bodies as being in a state of disuse. This shows that the enumerators' interpretations differed. It is critical that the government maintain, with revisions, such countrywide censuses of a key resource.

Way Forward

- Water bodies are increasingly under threat from pollution, encroachment, urbanization, and dryness. Action plans are needed to conserve and manage them properly, and they require baseline data.
- Because water bodies are governed by several authorities ranging from state to municipal to private, the data must be consistent and easily available.
- To effectively manage water bodies, integrating community contextual and traditional knowledge with formal data is needed.
- For the previous several years, data on reservoirs and rivers has been accessible on the India Water Resources

Information System (WRIS), but there has been no data on smaller water bodies, which are the lifeline of rural India and essential cultural, flood-control, and recreational places in cities.

What Is The EU's Carbon Border Adjustment Mechanism?

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: CBAM
Prepp Mains Booster: - Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

Context:
- Recently, the co-legislators at the European Commission signed the **Carbon Border Adjustment Mechanism (CBAM).**
- Carbon Border Adjustment Mechanism (CBAM) is a policy tool introduced by the EU to reduce carbon emissions by imposing a carbon tax on imported products, ensuring that they are subject to the same carbon costs as products produced within the EU.

What is Carbon Border Adjustment Mechanism (CBAM)?
- It is a system proposed by the European Union (EU) to **place a fair price on carbon emitted** during the manufacture of carbon-intensive commodities entering the EU, as well as to **encourage cleaner industrial output** in non-EU nations.
- **Avert carbon leakage:** Its primary objective is to **avert 'carbon leakage'** and encourage producers in non-EU countries to **green their manufacturing processes.**
  - Carbon leakage refers to a phenomenon where an EU manufacturer moves carbon-intensive production to countries outside the region with less stringent climate policies.
- It will **ensure a level playing field** between imports and EU products.
- **Reduction of Carbon Emissions:** This would also **form part of the continent's broader European Green Deal** which endeavors **to achieve a 55% reduction in carbon emissions** compared to 1990 levels by 2030 and become **a climate-neutral continent by 2050.**

Implementation
- The EU intends to gradually implement CBAM beginning October 1, 2023, resulting in a 20-35% tax on selected imports to EU nations by January 1, 2026.
- The European Union (EU) will implement the Carbon Border Adjustment Mechanism (CBAM) in 2026, **which will require importers in the EU to purchase carbon certificates.**
- Conversely, if a non-EU producer is paying a price (or tax) for carbon used to produce the imported goods, back home

or in some other country, the **corresponding cost would be deducted for the EU importer.**
- The European Commission, along with the relevant authorities of EU member states would be responsible for reviewing and verifying declarations and managing the central platform for the sale of CBAM certificates.
- Importers would be required to **annually declare by May-end** the quantity and embedded emissions in the goods imported into the region in the preceding year.

Replace EU's Emissions Trading System (ETS)
- The gradual introduction of the CBAM would be in parallel with the phasing out of the allocation of free allowances given out under the EU Emissions Trading System (ETS).
- The European Union (EU) already has an existing mechanism **called the EU Emissions Trading System (ETS)** to tackle greenhouse gas emissions and support the transition to cleaner industries.
- The ETS sets **emission limits for certain sectors** and allows the trading of emission allowances.
- Initially, some allowances were given for free to prevent carbon leakage, but this approach was found to discourage investments in greener production both in the EU and abroad.
- This was because of the tendency to rely on free allowances to meet operational requirements and obligations. Therefore, the EU is gradually phasing out the allocation of free allowances. Thus, the idea is to have an import-based tariff instead.
  - Emissions trading, also known as 'cap and trade', is a cost-effective way of reducing greenhouse gas emissions. To incentivise firms to reduce their emissions, a government sets a cap on the maximum level of emissions and creates permits, or allowances, for each unit of emissions allowed under the cap.
  - Emitting firms must obtain and surrender a permit for each unit of their emissions. They can obtain permits from the government or through trading with other firms. The government may choose to give the permits away for free or to auction them.
  - Emissions Trading is one of the so-called Kyoto Mechanisms under the United Nations Framework Convention on Climate Change (UNFCCC).

Why are countries worried?
- CBAM initially targets **carbon-intensive** sectors such as the cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen sectors. Eventually, it aims to encompass over half of the emissions in ETS sectors.
- According to the **United Nations Conference on Trade and Development (UNCTAD)** Russia, China, and Turkey were most exposed to the mechanism, and India, Brazil, and South Africa would be most affected among the developing

countries. Mozambique would be the most exposed least-developing country.

- **Countries like China, Brazil, and South Africa opposed the plan**, saying it could lead to **market distortion and impact developing countries** that have not originally contributed to industrial emissions.
- **India** has invoked climate justice on the global fora and contends that it places a carbon charge on companies from countries that **did not primarily or historically cause climate change.**

Sectors covered in the first phase of the CBAM - our environmental policy tool to help maximise the European and global impact of our fight against climate change.

CEMENT   IRON & STEEL   ALUMINIUM

FERTILISER   ELECTRICITY   HYDROGEN

#EUGreenDeal   European Commission

Impact on India

- **Rise in Prices:** India is concerned that these border fees on its goods entering the EU would raise the pricing of Indian-made items, making them less appealing to purchasers and perhaps reducing demand.
- It will subject these exports to extra scrutiny and impose carbon levies ranging from 19.8% to 52.7%, which could threaten India's major exports to the EU.
- **Export of Carbon Intensive products:** EU countries represent about 14% of India's export mix for all products, steel, and aluminum.
- According to the think tank, Observer Research Foundation (ORF) although India's exports in the cement, iron and steel, aluminum, fertilizers, electricity, and hydrogen sectors segments represented less than 2% of the total exports to the EU between 2019 and 2021, in the long-term the impact of the regulation can be severe for multiple factors.
- The measure is anticipated to reduce export of Indian metal metals such as iron, steel, and aluminum products drastically.
- **Disruption:** Companies with a **high carbon footprint would face substantial short-term issues as a result of the tax**, and the world trading system would be further disrupted by increased protectionism, trade wars, and renegotiations.
- **Balance of Payments:** Moreover, international climate policies, including CBAM, may lead other countries to adopt similar regulations, which could have a significant impact on India's trading relationships and balance of payments.

Way forward

India and E.U discussed E.U. Carbon Border Tax during the bilateral meetings and the first edition of the E.U.-India Trade and Technology Council (TTC). India and EU need to work and intensify their engagement on carbon border measures so that environmental goals and economic aspirations are achieved without any compromise.

Centre Looks Into Options To Counter EU's Carbon Tax Plan

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: EU Carbon Tax
Prepp Mains Booster: Environmental Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment, Climate change.

Context:

- The Commerce Ministry is exploring various **options to cope with the European Union's decision to introduce a Carbon Tax,** including retaliatory tariff measures.
- The European Union's proposed carbon tariff could reengineer the way global trade works and put to test the settled practices of the World Trade Organisation (WTO).
- The European Union had earlier proposed a policy called the **Carbon Border Adjustment Mechanism to tax products such as cement and steel, that are extremely carbon intensive, with effect from 2026.**
- BASIC, a group of Brazil, India, South Africa, and China, and thus large economies that rely heavily on coal, has for several years expressed common concerns and reiterated their right to use fossil fuels in the interim while their countries transition to clean energy sources.

About Carbon Border Adjustment Mechanism (CBAM)

- It is a system proposed by the European Union (EU) to place a fair price on carbon emitted during the manufacture of carbon-intensive commodities entering the EU, as well as to encourage cleaner industrial output in non-EU nations.
- The EU intends to gradually implement CBAM beginning October 1, 2023, resulting in a 20-35% tax on selected imports to EU nations by January 1, 2026.

- **A carbon border tax** is a levy levied on imported goods to equalize the cost of carbon emissions between domestic and international manufacturers.
  o The tax intends to address the issue of carbon leakage, which occurs when corporations relocate emissions-intensive activities to nations with less rigorous rules, resulting in a net rise in emissions.

What is Carbon Tax?

- Carbon Tax is a form of pollution tax which imposes a fee on the production, distribution, and use of fossil fuels based on the amount of carbon released during combustion.
- Carbon tax is a potential alternative to the protocol's current 'cap and trade' method.
- This tax is based on the amount of carbon in a fuel such as coal, for example.
- The goal of this tax is to reduce the use of fossil fuels while also providing an incentive to use alternative energy sources.
- The basic idea behind a carbon tax is to make carbon-intensive activities more expensive, providing an economic incentive for individuals, businesses, and industries to reduce their emissions.
- By placing a price on each ton of CO2 or its equivalent, the tax creates a financial cost for emitting greenhouse gases.

How does a carbon tax work?

- **Taxation:** The government imposes a tax on fossil fuels based on their carbon content. The tax can be levied at various points in the supply chain, such as extraction, production, or consumption.
- **Pricing**: The tax is typically applied as a fixed amount per unit of carbon emitted. For example, it could be a tax of $20 per ton of CO2 emitted.
- **Revenue**: The revenue generated from the carbon tax can be used in various ways. It may be used to fund renewable energy projects, energy efficiency programs, or to provide subsidies for low-carbon technologies. Alternatively, it can be returned to the public through tax rebates or used to offset other taxes.
- **Behavior change**: The higher cost of carbon-intensive activities encourages individuals, businesses, and industries to seek alternative, cleaner options that emit less carbon. It provides an incentive to reduce energy consumption, invest in energy-efficient technologies, switch to renewable energy sources, or adopt cleaner production methods.

*To read more about this topic, click on this link Carbon Tax

Challenges

- The EU intends to implement a mechanism that will include a monitoring mechanism for imports from manufacturers using non-green technology and a tax charge.
  o The measure is anticipated to drastically reduce Indian metal and engineered product shipments to the EU.

- Companies with a high carbon footprint would face substantial short-term issues as a result of the tax, and the world trading system would be further disrupted by increased protectionism, trade wars, and renegotiations.

Impact on India

- India is concerned that these border fees on its goods entering the EU would raise the pricing of Indian-made items, making them less appealing to purchasers and perhaps reducing demand.
- The tax would create serious near term challenges for companies with larger greenhouse gas footprint

Way Ahead

- To build a system to help Micro, Small and Medium Enterprises (MSMEs) is something that the Department of Commerce, the Ministry of Steel, and the MSME Ministry must attempt to collaborate on.
- The chairman of EEPC India, advocated for the inclusion of the primary iron and steel industry in the Remissions of Duties and Taxes on Exported goods (RoDTEP) plan and an increase in the scheme's advantages for engineering goods.
  o The RoDTEP refund for the engineering industry is typically in the range of 0.5% to 1%, which is much lower than the incentives granted under the previous Merchandise Exports from India Scheme, which offered incentives ranging from 2% to 5%.

Five More Cheetahs To Be Released Into Wild At Kuno National Park

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Kuno National Park

Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation; Environment, Biodiversity and Conservation

Context:

- Recently, the Union Environment Ministry stated that five more cheetahs (three females and two males) will be released from acclimatization camps at Kuno National Park (KNP) into "free-roaming conditions" before the start of the monsoon rains in June.

Background

- In 2022, the Ministry for Environment, Forests and Climate Change has launched the 'Action Plan for Introduction of Cheetah in India' under which 50 of these big cats will be introduced in the next five years.
- In September 2022, eight cheetahs were introduced to India from Namibia
- In February 2023, twelve cheetahs arrived in Madhya Pradesh from South Africa at the Kuno National Park (KNP), five months after the first batch of eight of these fastest land animals arrived from Namibia.
- Since September 2022, twenty cheetahs have been imported from Namibia and South Africa as part of a translocation initiative to restore the wild cat into the Indian environment.
- The animals were housed in dedicated cages as part of their acclimatization process.
  o Two of the animals, however, have died, one from a renal infection and the other from heart failure.

About Cheetahs

- The cheetah is a big cat endemic to Africa and Southwest Asia.
- It is the fastest land animal, capable of running at speeds ranging from 80 to 98 km/h, and as such has evolved unique adaptations for speed, such as a light frame, long slender legs, and a long tail.
- The cheetah lives in a variety of settings, including savannahs in the Serengeti, dry mountain ranges in the Sahara, and mountainous desert terrain in Iran.
- The cheetah is threatened by a number of issues, including habitat degradation, interaction with humans, poaching, and a high sensitivity to illness.
- African Cheetah
  o IUCN Red List: Vulnerable.
  o CITES: Appendix 1.
  o WPA: Schedule-2.
- Asiatic Cheetah
  o IUCN Red List: critically endangered.
  o CITES: Appendix 1.

o WPA: Schedule-2.

Why was the decision taken to release the Cheetahs?

- The decision was made after a panel of specialists examined the present situation of "Project Cheetah" under the guidance of the National Tiger Conservation Authority (NTCA).
- It was stated that all the cheetahs were in good physical condition, making kills at regular intervals and displaying natural behaviors.
- Cheetahs were chosen for release based on their behavioral characteristics and approachability by the monitoring teams.
- The rest of the cheetahs will remain in the acclimatization camps for the duration of the monsoon season.
- Certain internal gates will be left open to allow these cheetahs to utilize more space and for interactions between specific males and females to take place.
- The situation will be reviewed after the monsoon season and further releases into KNP or surrounding areas will be done in a planned manner as per the Cheetah Conservation Action Plan to establish meta population.

What is the long term plan?

- The long-term plan for acclimating the animals to Indian conditions is to gradually release the animals into the wild, though all of the animals are radio-collared and Madhya Pradesh State wildlife officials are tracking their movement and continue to add more animals from Africa until a sizeable self-sustaining population is established in a decade or so, while accounting for natural mortality and acclimatization-related challenges.
- So far, four of the cheetahs have been released into the wild, with one even traveling outside the Kuno National Park and onto farmland in Uttar Pradesh before being tranquilized and returned to the sanctuary.

What are the concerns regarding space and prey?

- The cheetahs, brought in from Africa, had on average too little space and limited access to prey in the KNP and this would pose considerable problems for their eventual flourishing in India.
- Available space in the KNP, about 100,000 sq. km. in the park and 600,000 in the landscape surrounding the park was adequate for 21 cheetahs. At present, there are only 18.
- In Africa, the cheetah's prey followed a migratory pattern requiring the cheetah to also traverse long distances to keep up with their prey.
- The forested environment in India meant that prey was not migratory and did not require the cheetah to travel great distances.

What is the significance of reintroducing cheetahs?

- Reintroducing the species into the country has long been supported by a group of conservationists.

- It is acknowledged as a tactic to protect endangered species and rebuild ecosystem services.
- The only large carnivore that has gone extinct is the cheetah, primarily due to historical overhunting in India.
- India now has the financial means to take into account recovering its lost natural heritage for both moral and environmental concerns.
- Much like Project Tiger has done for forests and all the species that have witnessed an increase in numbers, the protection of the cheetah will revitalise grasslands and their biomes and habitat

About Kuno National Park
- Kuno National Park is a national park and wildlife sanctuary in Madhya Pradesh, India. It takes its name from the Kuno River.
- It was established in 1981 as a wildlife sanctuary with an initial area of 344.686 km2 in the districts of Sheopur and Morena. It was designated a national park in 2018.
- For all wildlife aficionados and lovers, Madhya Pradesh's Kuno National Park is one of the most special places to visit.
- Chital, sambar, nilgai, wild pig, chinkara, and cattle are all present in good numbers.

Tiger Reserved: Fiftieth Anniversary Of Project Tiger Means Little To Forest-Dwelling Communities

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Down to Earth
Prepp Mains Booster: Conservation, environmental pollution and degradation, environmental impact assessment, Government policies and interventions for development in various sectors and issues arising out of their design and implementation, Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes; mechanisms, laws, institutions and Bodies constituted for the protection and betterment of these vulnerable sections

Context:
- Recently, Project Tiger, India's flagship program for observation of the country's flagship species celebrated its fiftieth anniversary.
- India's tiger population has risen from 1,827 in 1973 to 3,167 in 2023 with 53 tiger reserves spread across 2.3% of the country's geographic territory.
- The success of the project has come at the cost of the traditional communities that have been relocated in order to keep critical tiger habitats inviolate.

Project Tiger
- **Project Tiger is a Centrally Sponsored Scheme of the Ministry of Environment, Forests, and Climate Change.**
- The Project was **launched on April 1st, 1973** by the Government of India under Indira Gandhi from the **Jim Corbett National Park in Uttarakhand.**
- The Project began by notifying eight national parks and wildlife sanctuaries as tiger reserves.
- It was the first project of its kind in India to maintain the population of tigers and protect them from poaching and other threats.
- **At the time of the Project's introduction, there were only 1,827 tigers in the wild.**
- However, tiger numbers which reached a high of 3,700 in 2002 dropped to a low of 1,411 in 2006.
- The Sariska Tiger Reserve reported a wipeout of the tiger in this period due to poaching, and the trading of tiger parts.
- As a result, the **Wild Life (Protection) Act, 1972 (WLPA)** was amended to offer legal protection to tiger reserves and the establishment of the National Tiger Conservation Authority as a statutory body to oversee tiger conservation through ecological and administrative strategies.
- This has resulted in a significant increase in tiger populations and reserves over the years.
- **India's tiger population at present is around 3,167 tigers and is spread over 53 tiger reserves spread over 75,796 sq km or 2.3% of the country's geographic area.**

To know more about Project Tiger, click the link

How has Project Tiger affected the rights of forest communities?

- The success of Project Tiger has been found to have come at the cost of the forest communities that have traditionally resided in the areas around the tiger reserves.
- Despite multiple amendments to India's laws, the policies still follow the **fortress conservation approach** which is based on the strategy of exclude and protect.
- As per the Wild Life (Protection) Act, 1972, tiger reserves are overlaid in protected areas means that existing protected areas such as national parks and wildlife sanctuaries that are suitable for the visibility of the tiger species are designated as **critical tiger habitats (CTH)**.
- The forests in the periphery of the critical tiger habitats are classified as **buffer zones** which act as a transition zone between CTH and non-tiger reserves.
- According to the definition of the **CTH, they are to be kept inviolate. This has been interpreted as keeping it free of humans** resulting in the relocation of numerous villages.
- Although the law has prescribed prior informed consent of the Gram Sabha as a condition for relocation, this has not been strictly followed.
- Data from the MoEFCC has revealed that only 177 of the 751 villages in critical tiger habitats identified for relocation have been relocated since 1972.
- However, this data does not include the relocation of unsurveyed villages, those evicted from tiger reserves, or villages and families displaced from non-tiger reserve protected areas.

Protests and problems around relocation

- It was found that communities in some villages identified for relocation were opposing the move.
- The **2012 NTCA guidelines prescribe a minimum compensation of ₹15 lakhs (increased from ₹10 lakhs in 2021) for families in the form of monetary relief, or a combination of land, housing, and other facilities.**
- The Act and guidelines stipulate certain procedures that are to be followed before the relocation, but the promises generally remain unfulfilled.
- A study by Kalpavriksh, a non-profit, and The Environmental Justice Atlas, an online research portal, discovered that poorly implemented relocation was due to institutional apathy towards the forest communities.
- The study found that the prescribed relocation procedure was not followed leaving forest households worse off than before.
- The protests of the **Jenu Kurubas, a community of honey gatherers, against their eviction from the Nagarhole National Park** have been cited as an example of this.
- In 2019, families from the **Melghat Tiger Reserve, Maharashtra** demanded that their land be returned while 157 families of **Van Gujjars in the Jim Corbett National Park** were rehabilitated in 2013 with only 12 bighas and no assistance from the forest department for house construction.

- The relocation of the **Van Gujjars from the Sonanadi Wildlife Sanctuary, which is situated in the CTH area of the Jim Corbett National Park** is not included in the official database of voluntary relocation from tiger reserves.
- Poor conditions in the relocation site led to the death of one individual in 2009 in the **Achanakmar Tiger Reserve in Chhattisgarh** while around seven villages in **Bhoramdeo Wildlife Sanctuary, Chhattisgarh** were uprooted for a tiger reserve, which was never created.
- Problems were also faced by the communities in the post-relocation phase.
- A 2019 report prepared by the **Central Empowered Committee (CEC), constituted by the Supreme Court in the T N Godavarman Thirumulpad versus Union of India case** revealed that 122 of the 177 relocated villages have been resettled on forest land.
- However, the change in legal status from forest land to revenue land was performed in only 42 villages. As a result, families in the remaining 80 villages where the land status has not been de-notified after relocation are not able to access government welfare schemes.
- In 2019, the Supreme Court ordered that the land status for all 122 villages is de-notified and the provision is applied in all future relocations on the basis of the CEC report.

Forest Rights

- In 2006 the Union government also enacted the [Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act](#) in order to recognize the rights of forest-dwelling communities in all forest lands, including protected areas.
- However, the WLPA has failed to include the recognition of rights process while attempts have been made to compromise the implementation of the Forest Rights Act.
- In 2017, the NTCA published a circular as per which the Forest Rights Act cannot be conferred on CTH in the absence of relevant guidelines.
- However, the 2017 circular was overruled by another circular in 2018 which stipulated that the prescribed process under the Forest Rights Act is to be followed while settling rights in the CTH.
- The **process of recognizing the communities' rights in tiger reserves has been found to be much slower in comparison to the same process in other protected areas and non-protected forests.**
- Only a handful of tiger reserves such as the **Similipal Tiger Reserve (Odisha), Biligiri Rangaswamy Temple Tiger Reserve (Karnataka), and the Achanakmar Tiger Reserve (Chattisgarh)** have seen local communities conferred with forest rights.

- However, the state governments in these reserves **have not incorporated the management plans formulated by the local communities in their overall tiger conservation plans, which was violative of India's commitment to an inclusive conservation approach under the global biodiversity framework of the** Convention on Biological Diversity**.**

Way Forward

- In order to ensure the long-term sustenance of the tiger populations and their habitats in the country, conservation efforts need to adopt a **protected area model to replace the fortress conservation approach.**
- The conservation process in the country should be **inclusive of local communities, particularly in the decision-making and management process.**
- The latest edition of the tiger census in the country revealed that many tiger reserves in the country are approaching their threshold levels while some reserves in the northeast are suffering from a shortage of tiger populations.
- It has been found that developmental activities in proximity to tiger reserves have led to a **fragmentation of tiger corridors**.
- The **funds which have been allocated for the relocation of the villages must be reassigned to secure the connectivity of corridors and promote the coexistence and harmony of wildlife and humans.**
- An important step in ensuring human-wildlife coexistence is to **incorporate traditional and cultural practices of local communities in existing forest management structures**.

To know more about tiger reserves in India, click the link.

Studies On Migration Patterns Of Milkweed Butterflies And Their Feeding Habits Can Help Protect Them, Say Researchers

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Environment

Prepp Mains Booster: Environment, Biodiversity, Conservation

Context:

- A recent study by a team of researchers published in the recent issue of the Journal of Insect Conservation shed light on the migration patterns of **Milkweed butterflies in southern India**.
- The study has the potential to contribute to the conservation of these butterflies and their migration in the face of ongoing changes in land use, habitat degradation, and climate warming.

About the study

- **Migration:** Millions of Milkweed butterflies undertake a migration between the Eastern and Western Ghats in southern India, seeking refuge from the harsh summer.

- They migrate **westward from the Eastern Ghats** and plains to the Western Ghats after **southwest monsoon**, becoming active for more than two months upon their arrival.
- Between October and April, most of the Milkweed butterflies in the Western Ghats group in l**arge numbers at specific sites during winter and dry seasons.**
- When the summer rain cools southern India, the butterflies **migrate eastwards into the Eastern Ghats and the plains.**
- The studies reveal that the wings of the majority of butterflies during their eastward journey are more damaged than that in the westward migration.
- The dominant species involved in the migration, the Dark blue tiger and Double-branded crow, are not found breeding in the mid and high-altitude evergreen and semi-evergreen forests of the Western Ghats.
- According to the study, the adults of the **Dark blue tiger and Double-branded crow** that arrived in the Western Ghats may be **migrating reversely and breeding in the Eastern Ghats** and the plains of southern India. However, further studies are required to confirm the finding.
- **Ecological role:** The migration of Milkweed butterflies as pollinators plays a vital ecological role during the migration.
- **Threats:** Migration is threatened by **habitat destruction and climate change**.

What are milkweed butterflies?

- Milkweed butterfly, (subfamily Danainae), any of a group of butterflies in the **brush-footed butterfly (**q.v.) family, Nymphalidae (order Lepidoptera).
  - Brush-footed butterfly, (family Nymphalidae), also called four-footed butterfly, any of a group of butterflies (order Lepidoptera) that are named for their characteristically reduced forelegs, which are frequently hairy and resemble brushes.
- **Distribution:** The majority of species are found in both **Old and New World tropics**. Old World refers to Europe, Africa, and Asia, while New World refers to North America, South America, and the Caribbean.
- However, some well-known members such as the monarch butterfly (q.v.) and the **queen butterfly live in temperate regions.**

- **Species:** There are some **300 species in the group**, including the **iconic monarch**, all of which are **toxic to would-be predators**.
- They gain **most of their toxicity by feeding on plants** rich in alkaloids and come in a variety of bold and brilliant colors that serve as warnings to potential predators.
- The large, colorful adults have long, usually brownish or orange wings marked by black-and-white patterns.
- They fly slowly and deliberately, and some, such as the monarch butterfly, migrate great distances.

Western Ghats Vs Eastern Ghats

Western Ghats	Eastern Ghats
They run parallel to India's western coast. It is quite tough to get through them because they are continuous with no notable breaks.	The eastern ghats stretch parallel to India's eastern coastal lowlands.
The western ghats are the source of important rivers like the Tungabhadra, Krishna, and the Godavari.	They are discontinuous in character, unlike the western ghats, and are cut by rivers that pour into the Bay of Bengal. As previously stated, the majority of these rivers originate in the western ghats.
It should be mentioned that the western ghats of India play a significant influence in the distribution of monsoon rainfall along India's western border.	It should be noted that the value of the eastern ghats is lower than that of the Western Ghats
It creates orographic rainfall, which allows the windward side of the mountains to get a lot of rain while the leeward side remains dry.	The Jindhagada peak is the highest point in the Eastern Ghats (1690 meters). It is sometimes referred to as Arma Konda or Sitamma Konda.
The western ghats consist of evergreen forests too, however, the main crop grown there is Coffee	The forests include dry evergreen ones, semi-evergreen forests, southern tropical dry mixed deciduous forests, dry savannah forests, southern tropical dry scrub forests, southern tropical thorn forests, Carnatic umbrella thorn Forests, southern sub-tropical hill forests and southern thorn scrub.

Conclusion

- Studying their migration patterns and feeding habits will help to understand the interconnectedness of plant and animal life.

World Bee Day: Climate Change May Be Causing An Apple Crisis In Himachal And Kashmir This Year; Here's How

Priority: Medium
Primary Source: Down to Earth
Prepp Prelims Booster: Environment
Prepp Mains Booster: Major crops-cropping patterns in various parts of the country, - different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers, Conservation, environmental pollution and degradation, environmental impact assessment, Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location-changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

Context:

- Recently, climate change has been causing bees, who are one of nature's primary pollinators, to die in Himachal Pradesh and the Kashmir Valley, leading to major losses for apple growers and severe impacts on the economy.
- Apples which are grown on around 0.12 million hectares in Himachal Pradesh earn the state an annual turnover of about ₹5,000 crore.
- According to an estimate, it is possible to increase crop yield by 10-12 times through insect pollination while a study conducted by Tamil Nadu Agricultural University indicates that apple production increased by 44% through pollination from bees.

Why are apple growers in Kashmir and Himachal Pradesh concerned?

- According to horticulturalists in Himachal Pradesh and the Kashmir Valley, **climate change is causing bees, considered to be one of the world's primary pollinators, to die.**
- As a result, apple growers in the area were facing severe losses that could also impact the economies of the two regions.
- **Apple production is expected to decline by around 30% in Himachal Pradesh and by around 20% in Kashmir.**
- Apple growers in Kullu, Himachal Pradesh reported that bees died in boxes in their gardens when it rained in mid-April.
- The bees could not exit the box, so the apples could not be pollinated leading to a projected loss of 30-35% in apple production.

- The last time such an incident occurred in Shimla was in 1986 when it was extremely cold in April.
- Heavy rainfall was reported in April at a time when the apple crop was ready to flower. However, the **flowers could not be pollinated due to the death of the bees.**
- Apple growers in Himachal Pradesh are distressed over the lack of pollination of apple flowers due to the change in weather and possible after-effects on the economy.
- Apples are grown on nearly 0.12 million hectares in Himachal Pradesh generating an **annual turnover of around ₹5000 crores each year**.
- In the Kashmir Valley, **apples were damaged due to sudden rain and the resultant drop in temperature at the time of setting**, as a result of which the bees could not leave their boxes and pollinate the apple flowers.
- **Setting refers to a temporary phase between the pollination of flowers and the development of fruits.**
- The death of the bees was worrying for the apple growers in Kashmir as 100% of them used bees for pollination.
- **Sopore** is the largest fruit market in the Kashmir Valley and the President of the Sopore Fruit Association estimated that there may be a loss of 20-30% in the production of apples due to the lack of pollination.
- As a result of the **low temperature and unseasonal rain, cross-pollination was not possible, which had a visible effect on the regions' apple production.**
- **Apple cultivation in Kashmir has an annual turnover of ₹8,000 to ₹10,000 crores which is equal to around 10% of the total gross domestic product.**

How do bees participate in pollination?

- Climate change is causing the death of bees in Himachal Pradesh, whose economy is dependent on the bees who perform pollination.
- **Bees fill their stomachs with nectar and pollen collected from flowers through the male and female parts of the flowers.**
- **Pollen and nectar from the bees stick to the hair on the bees' bodies and thus travel from the male to the female parts of the flower.**
- An estimate revealed that **it is possible to increase the yield of many crops by 10 to 12 times through bee pollination.**
- **A study by the Tamil Nadu Agricultural University shows that apple production increased by 44% after pollination by bees.**
- According to the **Crop Load Management: Pollination Report p**ublished by the Himachal Pradesh Horticulture Department, two species - t**he Apis mellifera (Italian bee) and the Apis cerana indica (Indian bee)** - are used for large and commercial pollination in India.
- Mellifera bees, which were introduced in India in 1962 and reared in **Nagrota, Himachal Pradesh** have been used to promote horticulture in the state.

Comparison between Apis Mellifera and Apis cerana indica

- Of the two, the **Apis mellifera is more commonly used as it is much larger** than the Indian bee.
- The Indian bee flies up to a distance of 1 Km while the Italian bee flies for around 6 Km.
- In terms of temperature, the I**ndian bee flies in low light and between temperatures of 16-21°C while the Italian bee flies at temperatures between 21 and 25°C.**
- Apis Mellifera is also **more agile and completes pollination faster (25-30 flowers per minute) than Apis cerana indic**a. In comparison, the cerana pollinates at a rate of 20 flowers per minute.
- Although the Italian bee is useful in pollination, the increase in its numbers is believed to be due to the fall in the number of Indian bees.

What are the reasons for the decline in Indian bees?

- The decrease in the populations of naturally occurring insects is due to numerous reasons.
- The **clearing of forests for farming and horticulture** has led to a decrease in the habitats and plants that are capable of supplying food to the insects.
- The **indiscriminate use of pesticides** has led to a substantial decrease in the population of natural pollinating insects.
- A major reason behind the decline in number of bees is the **change in weather**. Apple growers have claimed that **Indian bees, unlike Italian bees, were not able to cope with the increase in temperatures** in medium-altitude Himachal Pradesh.
- However, **Italian bees could not cope with the lower temperatures** like the weather experienced this year which has led to their death.
- The unpredictability of climate has posed a serious risk to horticulturalists in the Himachal Pradesh and the Kashmir valley as their crop has been delayed by two months, which could also affect them economically.

To know more about the effects of climate change, click the link.

Disease Ravages Cattle Again

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Lumpy Skin Disease

Prepp Mains Booster: Economics of animal-rearing.

Context:
- Recently, the Union Ministry of Animal Husbandry urged the States to ensure that the vaccination drive is stepped up as the states of Maharashtra, Uttarakhand, Karnataka and Sikkim reported fresh cases of lumpy skin disease in May.
- Earlier in March Circular the centre had asked states to step up the vaccination before the monsoon.

What did the centre say?
- The Union Ministry of Animal Husbandry reviewed the situation and concluded that the infection was not as contagious as it was last year as cattle have now developed herd immunity.
- Despite 10,000 cases in the last two weeks, the centre has said the situation is under control. It urged for vaccination to be increased.
- In Uttarakhand, almost all the cases are new, but in Karnataka and Maharashtra, some of the cases had been reported before May. Uttarakhand had put a Statewide ban on the transportation of cattle.
- The Centre has also asked States to take precautions as vector diseases spread during the monsoon.
- Apart from vaccination, the Centre has asked the States to do fogging and disinfection drives in risky areas to avoid the spreading of diseases.
- **Status of Vaccination:** About **nine crore cattle** have been vaccinated and the recovery rate is above 94%.

What is the Lumpy Skin Disease (LSD)?
- It is a **highly infectious viral disease** that affects all breeds of cattle and water buffalo.

Clinical signs

Incubation period
- Between 4 and 14 days post-infection

Initial period
- High fever (41°C)
- Swollen lymph glands

Lumpy skin disease

- Animal may develop large, firm nodules of 5 cm in diameter in the skin
- Depression, anorexia, rhinitis, conjunctivitis, excess salivation

Marked decrease in milk production

Necrotic lesions can develop in respiratory and gastrointestinal tract

Morbidity
Between 5% and 45%

- It is caused by a virus called the **Capripoxvirus and is genetically related to the goatpox and sheeppox** virus family. It has emerged as a threat to livestock worldwide.
- **Origin and Spread:** Historically, LSD disease remained confined to Africa, where it was first discovered in 1929.
- But in recent years, its geographical spread has expanded beyond the endemic areas. It was first reported in the Asia and Pacific region in 2019 in North West China, Bangladesh and India.
- **Vectors:** LSD is transmitted to cattle and water buffalo mainly through vectors such as **blood-feeding insects such as biting flies, mosquitoes, and ticks.**
- It can also be spread through direct contact between animals via secretions and **excretions such as saliva**. Contaminated water and feed can also spread the disease
- **LSD is not a zoonotic disease**, meaning it does not spread from animals to humans, and humans cannot get infected with it.
- However, **milk produced by LSD disease**-infected animals is fit for human consumption **only after boiling or pasteurization** as these processes will kill the viruses if present in the milk.
- **Symptoms**: Infected animals immediately start **losing weight and may have fever** and lesions in their mouth, **along with a reduced milk yield.**
- They may also get affected by **circular, firm nodes that look similar to lumps on their hide or skin**. These lumps are 2 to 5 cm in diameter. These lumps gradually **open up like large and deep wounds.**
- Other clinical symptoms include excessive nasal and salivary secretion. Pregnant cows and buffaloes may suffer a miscarriage. In some cases, it can also cause the death of infected animals.

- **Treatment:** There is **no treatment for the LSD virus**. Prevention by vaccination is the most effective means of control.
- Secondary infections in the skin of infected animals can be treated with **Non-Steroidal Anti-Inflammatories (NSAIDs) and also with antibiotics.**
- **Prevention:** It relies on four tactics: Movement Control (quarantine), Vaccination, Slaughter Campaigns, and Management Strategies.
- Prevention and eradication by rapid and widespread vaccination campaigns are the **most effective means to control the spread of the disease.**
- Once an animal has recovered from it, it cannot be the source of infection for other animals.
- **Disinfection of cattle sheds** must be done to eliminate vectors through the application of insecticides and spraying disinfectant chemicals.
- Carcasses of dead diseased animals must be properly disposed of through **incineration or burning of the bodies** at high temperatures.

Impact of Lumpy Skin Disease (LSD)

- According to the 20th Livestock Census (2019), I**ndia is the top country by number of cattle and buffaloes in the world**. There are around 303 million cattle and buffaloes in India.
- **Income of farmers:** Its spread in India will have a **devastating impact on most dairy farmers** who are either landless or marginal landholders and on the country's milk production, as it is among the cheapest protein sources.
- **Nutrition security:** Milk is considered one of the **cheapest sources of protein**, lumpy skin disease reduces milk production thereby decreasing the supply of milk.
- **Trade bans:** The spread of the disease can lead to "substantial" and "severe" economic losses according to FAO and the World Organisation for Animal Health (WOAH). The movement and trade bans after infection puts an economic strain on the whole value chain.

What should be done?

- **Vaccination** of susceptible populations with more than 80% coverage, movement control of bovine animals and quarantining,
- implementing biosecurity through vector control by **sanitising sheds and spraying insecticides,**
- strengthening **active and passive surveillance**;
- spreading awareness on risk mitigation among all stakeholders involved, and
- creating large protection and surveillance zones and vaccination zones.

What is Lumpi-ProVacInd?

- Lumpi-ProVacInd is a live attenuated homologous vaccine, similar to those used against tuberculosis, measles, mumps and rubella.
- It provides 100% protection against LSD in cattle.

- It is jointly developed by ICAR's National Research Centre on Equines (NRCE) at Hisar, Haryana and the Indian Veterinary Research Institute (IVRI) at Izatnagar, Uttar Pradesh.

ISRO To Start Online Training Programme For PG And Final-Year UG Students

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Science and Technology
Prepp Mains Booster: Issues relating to the development and management of Social Sector/Services relating to Health, Education, and Human Resources; Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:

- Recently, the **Indian Space Research Organisation (ISRO)** announced a new **introductory-level online training program** called Space Science and Technology Awareness Training (START).
- START is aimed at **postgraduate and final-year undergraduate students** of **Physical Sciences and Technology.**

About Space Science and Technology Awareness Training (START)

- The START program would be led by Indian academia and ISRO centres and will cover various domains of space science, such as Astronomy & Astrophysics, Heliophysics & Sun-Earth interaction, Instrumentation, and Aeronomy.
- It is a part of ISRO's initiative to encourage **Indian students to pursue careers in space science and technology**, as the organization's exploration program continues to expand.
- The program aims to provide students with a **foundational understanding of space science and technology**, introducing them to different aspects of the field, research opportunities, and career paths.
- The training will also emphasize the **interdisciplinary nature of space science, highlighting how individual skills** can be applied to the field.

How will it benefit the Student community?

- The students will be benefited from this training program, as they
  o will receive an overview of the **different facets of space science** and technology,
  o **exposure to the research** ongoing in various Indian institutes,
  o insight into how their **individual aptitude** would suit some of the facets of space science and technology,
  o appreciate the cross-disciplinary nature of the subject, and accordingly **choose their career path.**
- Academic institutions can submit applications for the program through the Jigyasa portal by May 20.
- **Remote sensing courses:** The ISRO's National Remote Sensing Centre (NRSC) has recently introduced two short courses - Remote Sensing Data Acquisition and Remote Sensing Data Processing.
- These courses will be conducted by the Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) at the Earth Station in Shadnagar, near Hyderabad.
- CSSTEAP is an educational institution that is affiliated with the United Nations. The courses are scheduled for August 21 to September 1 and October 9 to 20.

Significance

- **Skilled labor:** By training students in different facets of space science and technology the program aims to build a talent pool that **can contribute to the country's emerging space industry.**
- **Leading space science:** Currently, India's share in the space economy is close to 2%. This initiative is expected to create a talented **workforce capable of leading space science** and research in the future.
- By building a strong human capacity in space science and technology, the START program can support India's aspirations to become a leading player in the emerging space industry.
- **Developing Scientific Temper**: Exposure to research in various institutions will Inculcate scientific temper among the younger generation; this would play a crucial role in the nation's socio-economic development.

> Article 51A(h): To develop the scientific temper, humanism, and spirit of inquiry and reform.

- **Awareness:** This will give students an opportunity to interact with researchers and make informed career choices which in turn will promote innovation.

India Captures The Rare Aurora Lights On Camera For The First Time

Priority: Medium
Primary Source: Times of India
Prepp Prelims Booster: Geography
Prepp Mains Booster: Important Geophysical phenomena

Context:

- Recently, the Indian Astronomical Observatory above Mount Saraswati has captured a **rare occurrence of aurora on** camera in Ladakh, India.
  o This is for the first time that such an occurrence was captured on camera in India.
- The 360-degree camera atop the IAO in Ladakh Hanle captured the unusual phenomena, which is **caused by an interaction between the Sun's plasma particles and the Earth's magnetic field.**
- The **auroras are normally seen at higher altitudes** in parts of Alaska, Norway, and other countries.

What are Auroras?

- An aurora is a natural phenomenon marked by a display of natural-colored (green, red, yellow, or white) light in the sky.
- Aurora is also known as 'polar light'. **It is more common in high-altitude places such as the Arctic and Antarctic.**
- The display is known as the aurora borealis or northern lights in the north. It is known as the aurora australis, or southern lights, in the south.

What causes Aurora?

- Aurora is caused by a collision between the Sun's plasma particles and the Earth's magnetic field.
- They are created by solar particles that reach the Earth's atmosphere and collide with gas particles such as oxygen and nitrogen.
- The Sun provides us more than just heat and light. It also delivers us a large amount of additional energy and microscopic particles.
  o The protective magnetic field that surrounds Earth shields us from most of the energy and particles.
- But the Sun does not always give the same quantity of energy. There is continual solar wind and solar storms.
- The Sun releases a gigantic bubble of electrified plasma that may move into space at tremendous speeds during one type of solar storm known as a coronal mass ejection.
- When a solar storm approaches Earth, some of the energy and tiny particles can flow down the magnetic field lines at the north and south poles into the Earth's atmosphere.

- There, the particles mix with gases in the atmosphere, resulting in stunning displays of light in the sky. Oxygen emits green and red light. Nitrogen shines blue and purple.
- **Auroras aren't only a phenomenon that occurs on Earth.**
  o If a planet has an atmosphere and a magnetic field, it almost certainly possesses auroras. Jupiter and Saturn both have aurora displays.

How was it seen in India?
- The aurora lights were seen as a result of a strong interaction between the sun's plasma waves and the Earth's magnetic field.
- A **'coronal mass ejection,'** or 'CME,' was hurled from the sun at a speed of 21,60,000 kilometers per hour and collided with the Earth's magnetic field.
- During a coronal mass ejection, billions of charged particles are ejected into space at incredible speeds, with some exceeding 3 million kilometers per hour.
- When they reach Earth, they generate a disruption in the Earth's magnetic field, allowing us to view the aurora lights.

What is the significance?
- The capture of the rare Aurora phenomena on camera in India is significant for several reasons.
  o The Aurora is most commonly seen in the polar regions. It is astonishing that it was captured in India.
  o The Aurora phenomenon is a natural light show that is regarded as one of the most beautiful displays in the world.
  o The Aurora phenomenon captured in India can be used as a valuable tool for scientific research too.

About Indian Astronomical Observatory (IAO)
- The Indian Astronomical Observatory (IAO) is a high-altitude astronomy station in Hanle, India, run by the Indian Institute of Astrophysics.
- The IAO is one of the world's highest-placed optical, infrared, and gamma-ray telescope sites, positioned at 4,500 meters (14,764 feet) in the Western Himalayas. It is now the world's tenth-highest optical telescope. It is India's first dark-sky reserve.
- The Indian Astronomical Observatory is located atop Mt. Saraswati, Digpa-ratsa Ri, Hanle in the Indian union region of Ladakh.

Smart Gel-Based Sheet Can Form 3D Printed Conduit Helping Non-Invasive Nerve Repair

Priority: Medium

Primary Source: PIB

Prepp Prelims Booster: Science and technology
Prepp Mains Booster: Achievements of Indians in science & technology; Indigenization of technology and development of new technology.

Context:

- Recently, **Scientists have developed a novel smart gel-based sheet using three-dimensional (3D) printing technology.**
- This gel-based sheet can **self-roll into a tube during surgery to construct a nerve conduit,** which could assist in minimizing the complexity of surgeries and aid in the speedy healing of nerve damage.
  o The work was supported by the **Science and Engineering Research Board (SERB),** a statutory body of the Department of Science and Technology, under the Intensification of Research in High Priority Areas (IRHPA) special call on 3D Bioprinting.

What is 3D printing?
- Three-dimensional printing (3-D printing), also known as Additive manufacturing (AM), is a method of connecting materials to create items from 3D model data, generally layer upon layer.
- It is essentially the technique of creating three-dimensional physical objects from a digital source.
- Charles W. Hull of 3-D Systems Corp. invented the first functional 3-D printer in 1984. Stereolithography Apparatus was the name given to the machine.
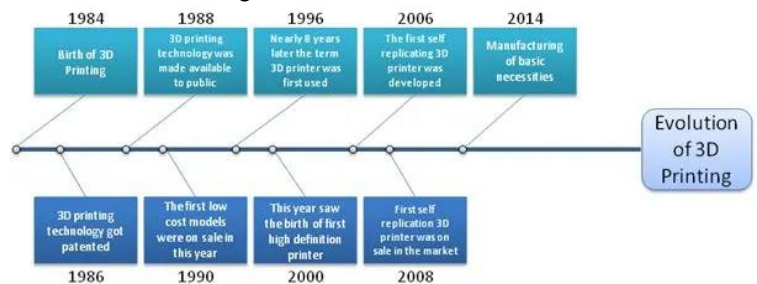
Applications of 3D printing
- 3D printing is widely utilized across the world. It is rapidly being utilized for mass modification and manufacture of any form of open-source design in agriculture, healthcare, the automobile industry, the locomotive industry, and the aviation industry.
- It can print an item layer-by-layer deposition of material straight from a computer-aided design (CAD) model.
- It is suitable for a variety of applications, including inexpensive housing up to G+3 floor, military barracks, single-floor schools, storage, lodging, and villas.
- 3D printing technology is used for prototyping and distributed manufacturing in architecture, construction, industrial design, automotive, aerospace, dental and medical industries, biotech (human tissue replacement), fashion, jewelry, education, geographic information systems, and many other fields.

What is the current treatment for nerve injuries?
- Autografts are still considered the gold standard for the repair of peripheral nerve injuries.

o A nerve autograft is sourced from within the body. It is typically taken from a sensory nerve that provides sensation to an area of the skin where sensation is not vital.

- Bioresorbable polymer-based conduits are also being investigated for clinical application as alternatives.
- **Limitations:** However, these treatment strategies have several limitations, including donor site morbidity in the case of autografts and the requirement for sutures, which necessitate highly skilled microsurgeries.

What are the recent developments?

- Clinical problems prompted researchers to create a smart gel-based sheet employing three-dimensional (3D) printing technology that can self-roll into a tube during surgery to build a nerve conduit.
- In 3D printing, a virtual model of the item is developed using design software, and the part is then built using a 3D printer by layer-upon-layer deposition of the material.
- After fabrication, 3D printed parts can undergo shape changes on demand.
- Such technologies are now commonly referred to as **four-dimensional (4D) printing**, where time is the extra dimension.
- **In the recent work,** researchers created a bilayered gel sheet by 3D printing two gels in predefined patterns. The gel compositions were chosen to swell in diverse ways.
  o When the dried gel sheet was placed in water, it inflated quickly and twisted into a tube shape.
  o The folding behavior and ultimate shape of the gel may be regulated to create tubes of specified size, which computer modeling could predict.
  o The gel sheets were then covered with tiny nanometer-scale fibers to allow cells in the body to attach to them.

About 4D Printing

- 4D printing is a more advanced variant of 3D printing in which the fourth dimension is time.
- This fourth dimension alludes to the notion of self-assembly, in which a 3D printed item may reshape or self-assemble itself using external passive energy such as heat, gravity, magnetics, or even hot water.

Previous news related to application of 3D printing

- **Indian Army inaugurated its first 3-D Printed House Dwelling Unit**
  o The Indian Army inaugurated its first 3-D Printed House Dwelling Unit (with Ground Floor + 1st Floor) for soldiers at Ahmedabad Cantonment.
  o The dwelling unit has been constructed by the Military Engineering Services (MES) in collaboration with MiCoB Pvt Ltd incorporating the latest 3D Rapid Construction Technology.
- **India's first 3D-printed post office**
  o A 3D-printed post office will be built in Cambridge Layout in Ulsoor, Bangalore.

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o Larsen & Toubro, which has experience with 3D-printed buildings, is implementing it.
o It is a 1,100 square foot structure that is predicted to cost 30-40% less than traditional constructions due to technology intervention.

The Axolotl Mutant And Its Mystery Gene

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Science and Technology
Prepp Mains Booster: Science and Technology- developments and their applications and effects in everyday life.

Context:

- In this article, D.P. Kasbekar, a retired scientist has discussed the research conducted on **Axolotls,** a species of salamander **known for their ability to regenerate lost body parts,** and the potential implications for human regenerative capabilities.
- A **group of scientists is now investigating how axolotls regenerate lost limbs, gills, tails, and even eyes and sections of their heads.**
  o The goal is that by knowing how axolotls rebuild lost body parts, we might learn how to improve our own chances of doing the same.

About Axolotl

- The axolotl is a species of salamander (lizard-like amphibians) originally found in Lake Xochimilco, near Mexico City. They are now almost extinct in the wild.
- Their gene pool survives among individuals bred in captivity for the pet trade and for aquaria.

Conservation Status of Axolotl

- It is listed as critically endangered in the wild, with a decreasing population of around 50 to 1,000 adult individuals, by the International Union for Conservation of Nature and Natural Resources (IUCN).
- It is listed under Appendix II of the Convention on International Trade in Endangered Species (CITES).

About Salamanders

- Salamanders are a group of amphibians distinguished by the bodies, blunt snouts, short limbs extending at right angles to t in both larvae and adults.
- Salamanders seldom have more than four toes on their front although some species have fewer digits and some lack hind
- Their porous skin generally makes them dependent on enviro other chilly, wet locations.
- Some salamander species spend their whole lives in the wate occasion. This group of amphibians is capable of recovering r injured sections of their body.

Characteristics of Axolotls

- **Regenerative abilities:** Axolotls are renowned for their remarkable regenerative capabilities. They can regenerate lost body parts, such as lost limbs, gills, tail, even their eyes, and parts of the head.
  o Axolotls have long attracted scientists due to their capacity to recover lost body parts and their unique attribute of neoteny, which means they maintain larval traits throughout their lives.
- **Amphibians:** Mexican axolotl salamanders are amphibians that spend their whole lives underwater.
- **Neoteny:** Neoteny is the phenomenon where an organism reaches sexual maturity while still in its larval form. Axolotls are neotenic, meaning they retain their gills, fin-like limbs, and other larval features into adulthood.
- **Feeding habits:** Axolotls are carnivorous and primarily feed on small aquatic organisms such as mollusks, worms, insect larvae, crustaceans, and some fish.

Findings of the Mutant
Dr. Humphrey's Findings
  o Dr. Humphrey mated a pair of sibling axolotls in his laboratory at Indiana University, Bloomington, in the mid-1960s. The mating resulted in larvae that swarmed the laboratory glass bowl - and started chewing each other's legs off.
  o Dr. Humphrey separated the regenerators, matured them, and mated them. He discovered that the males were infertile, whilst the females produced eggs that did not develop, even when fertilized by sperm from normal males.
  o He proposed in 1966 that both members of the original brother-sister pair had a mutation in one copy of a gene he termed o (for "ova deficient"). However, the other copy of the gene was functioning.
  o **Axolotls, like humans, contain two copies of every gene** – one inherited from the father and the other from the mother. The cell created as a result of an axolotl sperm fertilizing an axolotl egg is called a zygote.
  o Dr. Humphrey discovered that when a male and female axolotl with the o mutation mated, 25% of the resulting fertilizations involved the fusion of mutant sperm and eggs. These zygotes lacked a functional copy of the o gene, leading to poor limb regeneration.
  o The remaining 75% of fertilizations involved non-mutated sperm, eggs, or both, resulting in normal larvae capable of regenerating limbs and becoming fertile adults.

Dr. Briggs's Finding
  o Dr. Briggs discovered in 1972 that by injecting eggs from normal females, he could cure the developmental abnormality of a mutant axolotl female's eggs.
  o He then fertilized the mutant eggs with sperm from male axolotls with one mutated and one functioning copy of the o gene.

  o Initially, all of the resultant zygotes behaved similarly and progressed to an advanced developmental stage. However, 50% of the zygotes that lacked a functioning copy of the o gene ceased growing at this point.
  o The other half, which had one functioning copy of the o gene from the father, continued to develop.
  o This revealed to Dr. Briggs that the father's copy of the o gene had no influence on the zygote's early development but began to do so later on.
  o Instead, in the early stages, the zygote was dependent on the o gene product deposited by the mother in her eggs. Even sap from frog egg nuclei functioned.

How did the tragedy strike?
- The researchers were studying the effects of a mutation in the o gene that was essential for normal development and regeneration of damaged appendages.
- However, maintaining the o mutation for their experiments turned out to be difficult.
- The mutation's effect could only be observed in individuals who lacked a functional copy of the o gene, but these individuals were sterile and couldn't produce offspring.
  o So the researchers had to rely on individuals who had one functional copy and one mutant copy of the gene, which were indistinguishable from individuals with two functional copies.
- To overcome this challenge, the researchers had to set up multiple sibling matings in each generation, specifically selecting broods in which 25% of the offspring exhibited poor regenerative abilities.
  o They would then use these poor regenerators for further experiments and set up new sibling matings to produce the next generation.
- The continuous sibling mating over several generations led to increasing inbreeding, resulting in the development of additional abnormalities in the individuals used for the study.
- Eventually, tragedy struck as the o mutant gene was lost before the researchers could utilize the analytical tools necessary to identify the specific component in the sap that was responsible for rescuing the mutant eggs.

ASTR: How Govt's AI And Face Recognition Tool Will Detect Phone Frauds

Priority: Medium
Primary Source: Indian Express
Prepp Prelims Booster: Government Schemes
Prepp Mains Booster: Achievements of Indians in science & technology; Indigenization of technology and development of new technology. Cyber Security

Context:
- The Department of Telecommunications (DoT) has developed an **artificial intelligence-based facial**

recognition tool, **Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification (ASTR),** that can analyze the subscriber databases of telecom operators to identify whether there are multiple connections linked to the same individual

- According to DoT, it can potentially **bring down cyber frauds** by detecting and **blocking possible fraudulent mobile connections.**

Working

- Human faces in subscribers' images are encoded using **convolutional neural network (CNN) models** in order to account for the tilt and angle of the face, opaqueness and dark colour of the images.
  - In deep learning, a convolutional neural network (CNN) is a class of artificial neural networks most commonly **applied to analyze visual imagery.**
- **Face comparison:** A face comparison is carried out for **each face against all faces** in the **database**, and similar faces are grouped under one directory.
- **Fuzzy logic:** After matching the faces, ASTR's system employs "fuzzy logic" to **identify approximate or similar matches** for the subscriber **names.**
- If someone were to seek for "Apple Inc.", for instance, the algorithm would return results such as "Apple Incorporated," "Apple Park," "iPhone," etc.
- It also accounts for any typographical errors that might have occurred while the subscriber acquisition form was being filled.
- **Two steps:** The DoT allows an individual to take **nine legitimate mobile phone** connections using **a single identity proof.**
  - Basically, what the ASTR does is, it looks up if there are **more than nine connections against a single individual's photograph;**
  - It runs a search through the database to see if the same person has taken SIMs under different names.
- **Blocking:** After the DoT has determined that a set of numbers have been obtained by people through fraudulent means it shares the list with telecom operators for blocking.
- The same list is also shared with banks, payment wallets, and social media platforms for disengaging these numbers from their respective platforms.

Success using ASTR

- ASTR is capable of detecting all SIMs against a suspected face in less than 10 seconds from a **database of 1 crore images.**
- Two faces are concluded to be **identical by ASTR** if they match to the extent of **at least 97.5 per cent.**
- **In first phase**, analysis of more than 87 crore mobile connections was carried out using **Param-Sidhhi Supercomputer** was used.

- Param Siddhi is a high performance computing-**artificial intelligence (HPC-AI) supercomputer** established under **National Supercomputing Mission (NSM) at C-DAC** has achieved global ranking of 63 in TOP 500 most powerful non-distributed computer systems in the world released on 16th November 2020.
- Multiple cases were detected where one photograph was used to obtain hundreds of connections.
- A total of 40.87 Lakh suspected mobile connections were detected.
- After due verification **36.61 Lakh connections have already been disconnected.** Remaining are under process.
- 40,123 Point of Sales (PoS) involved in selling such mobile connections, have been blacklisted by the service providers and **more than 150 FIRs have been lodged across India.**

Sanchar Saathi portal

- Sanchar Saathi portal is a **citizen-centric initiative of the Department of Telecommunications** to empower mobile subscribers, strengthen their security and increase awareness about citizen-centric initiatives of the Government.
- Sanchar Saathi empowers citizens by allowing them t**o know the mobile connections issued in their name**, get disconnected connections not required by them, block/trace lost mobile phones, and check the genuineness of devices while buying a new/old mobile phone. Sanchar Saathi contains various modules like CEIR, TAFCOP, etc.

Modules under the Sanchar Saathi portal

- **CEIR (Central Equipment Identity Register)** – for blocking stolen/lost mobiles.
- **Know your mobile connections** – to know the mobile connections registered in your name.
- **Telecom Analytics for Fraud Management and Consumer Protection (TAFCOP)**- It facilitates a user to check the number of mobile connections taken in her/him name using paper-based documents.

- **ASTR (Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification)** – to identify fraudulent subscribers.

India Set To Triple Speed Of Its Fastest Supercomputers

Priority: High

Primary Source: The Hindu

Prepp Prelims Booster: Science & Technology

Prepp Mains Booster: Science & Technology

Context:
- **India plans to significantly boost its supercomputing capabilities by installing an 18-petaflop system this year.**
  - A petaflop represents a processing speed of 1,000 trillion floating point operations per second.
- This substantial increase in processing power will greatly facilitate complex mathematical calculations required and ability to predict weather conditions, spanning from the next few days up to two or three months ahead.

Background
- In December 2018, the Modi government signed an agreement with France to purchase high-performance computers worth Rs 4,500 crore by 2025.
- The new earth-sciences Ministry computers are expected to cost around Rs.900 crore.
- Systems must be upgraded every 4 to 5 years. With our current hpc, we can map weather and climatic changes at a resolution of 12*12 km. The resolution can be increased to 6*6 (km) using the new technology.
- The ultimate objective is to be able to describe a region using 1 km-square grids, which may then be utilized to warn of cloudbursts and such quickly changing weather phenomena.
  - **The fastest high-performance computing system in the world is currently the Frontier-Cray system at Oakridge National Laboratory, United States.**
  - This has a peak speed of 1 exa-flop (or about 1,000 petaflops). The top 10 other systems, based on speed, range from about 400 petaflops to 60 petaflops.

What are Supercomputers?
- **Supercomputers are high-performance computing systems** designed to process and solve complex problems at an extremely fast rate. They are built to deliver superior processing power and storage capabilities compared to traditional computers.
- Supercomputers excel in performing large-scale simulations, data analysis, modeling, and computations that require massive amounts of data processing and parallel computing.
- These machines are typically composed of thousands to millions of interconnected processors working together in parallel to execute tasks.

- **PETAFLOP** is a measure of the processing speed of a Supercomputer and can be expressed as a thousand trillion floating-point operations per second.
  - **FLOPS** (floating-point operations per second) are commonly used to measure a computer's processor performance.
  - The extremely long numbers can be handled relatively easily with floating-point encoding.
- Supercomputers are primarily intended for usage in enterprises and organizations that require massive computing power.
- For example weather forecasting, intelligence gathering and analysis, scientific research, data mining, etc.

History of Supercomputers
- Control Data Corporation (CDC) created the first supercomputer in the 1960s.
- This supercomputer featured only one CPU but ten peripheral processors, each of which controlled input and output and kept the CPU's queue full.
- The computer used more processors and was at least ten times faster when compared to other computers available. The size of the first computer was about the size of four filing cabinets.
- The CPU contained ten parallel functions, and each processor was responsible for dedicating different tasks, floating-point divide, floating-point add and Boolean logic.

Characteristics of Supercomputers
- These computers can do complex computations that conventional computers cannot.
- A supercomputer allows numerous users to utilize supercomputing at the same time.
- It has a large storage capacity.
- The computer can handle applications that demand real-time processing.
- These computers can accommodate CPUs with high calculation speeds.

Applications of Supercomputers
- **Scientific Research:** Supercomputers are extensively used in scientific research to simulate and model complex phenomena. They are employed in fields such as astrophysics, climate modeling, molecular dynamics, quantum mechanics, and particle physics to analyze large datasets, perform simulations, and solve complex equations.
- **Weather Forecasting:** Supercomputers play a crucial role in weather prediction and climate modeling. They process massive amounts of meteorological data, perform complex simulations, and run atmospheric models to generate accurate weather forecasts and study climate patterns.
- **Drug Discovery and Biomedical Research:** Supercomputers enable scientists to simulate and analyze the behavior of molecules and proteins, aiding in drug discovery and

development. They help in understanding biological processes, protein folding, genomics, and personalized medicine by performing large-scale molecular dynamics simulations and analyzing massive genomic datasets.

- **Aerospace and Engineering:** Supercomputers are utilized in aerospace and engineering industries for computational fluid dynamics, structural analysis, and aerodynamic simulations. They assist in designing and optimizing aircraft, spacecraft, and other engineering systems, reducing the need for costly physical prototypes.
- **Energy and Nuclear Research:** Supercomputers support research in energy production, fusion, and nuclear physics. They are used to model and simulate nuclear reactions, analyze energy grids, optimize energy systems, and study the behavior of plasmas.
- **Data mining:** Large organizations frequently utilize specialized computers to extract usable information from data storage warehouses or a cloud system. For example, life insurance firms employ supercomputers to lower actuarial risks.
- **Detecting natural disasters:** It will increase emergency readiness for local storms, severe rain, and flooding by improving forecasting of local-scale weather using very high-resolution simulations.

India's first Supercomputer

- When India was facing difficulty in the 1980s concerning supercomputers, the Centre for Development of Advanced Computing was introduced. The C-DAC introduced the PARAM 8000 supercomputer in 1991 with a speed of 1 Gigaflop.
- **PARAM 8000 was India's first supercomputer. PARAM here means Parallel Machine.**
- After PARAM 8000, the C-DAC introduced PARAM 8600. As a part of its second and third mission, the C-DAC unveiled PARAM 9000 and PARAM Padma with teraflops range.
- o **Currently, India's most powerful civilian supercomputers, Pratyush and Mihir, with a combined capacity of 6.8 petaflops,** are situated at the Indian Institute of Tropical Meteorology (IITM) in Pune and the National Centre for Medium Range Weather Forecasting (NCMRWF) in Noida, respectively. They went into operation in 2018 after a Rs.438 crore investment.

About National Supercomputing Mission
- The National Supercomputing Mission was launched in 2015 to enhance the country's research capacity and capabilities by connecting them to form a Supercomputing grid, with the National Knowledge Network (NKN) serving as the backbone.
- The NKN project aims to build a strong and robust Indian network capable of providing secure and reliable connectivity.

- It supports the government's 'Digital India' and 'Make in India' initiatives.
- The Mission is jointly steered by the Department of Science and Technology (DST) and the Ministry of Electronics and Information Technology (MeitY).
- It is being carried out by the Centre for Development of Advanced Computing (C-DAC) in Pune and the IISc in Bengaluru.
- The mission was divided into three phases:
- o Phase I focuses on the assembling of the supercomputers.
- o Phase II will look at manufacturing certain components within the country.
- o India will design a supercomputer in Phase III.

Indian Supercomputers in Global Supercomputing list
- **AIRAWAT** has secured the 75th position.
- **PARAM Siddhi**-AI supercomputer ranked at No. 131.
- **Pratyush** supercomputer ranked at No. 169.
- **Mihir** supercomputer at No. 316.

Supercomputers vs. Mainframe Computers

- Supercomputers are purpose-built computers created for engineers and scientists to tackle scientific and mathematical challenges. These computers handle issues that need high speed and a significant quantity of memory.
- A mainframe computer is a scalable and purpose-driven computer that allows an organization to hold massive datasets while concurrently serving a large number of people.

India Moves Closer To Getting Its First Indigenous Vaccine Against Dengue

Priority: Medium
Primary Source: The Hindu
Prepp Prelims Booster: Science and technology
Prepp Mains Booster: Issues relating to development and management of Social Sector/Services relating to Health; Science and Technology- developments and their applications and effects in everyday life

Context:
- **India is moving closer to developing its first-ever vaccine against dengue,** as the indigenous **drug-makers Serum Institute of India (SII) and Panacea Biotech have applied for collaboration with the Indian Institute of Medical Research's (ICMR) collaboration** on Phase-3 trials.
- o **Every year on May 16, the country marks National Dengue Day** as part of an initiative spearheaded by the Ministry of Health and Family Welfare.

About Dengue and its Status in India
- **Dengue, often known as break-bone fever,** is a viral virus that passes from mosquitoes to humans, resulting in a considerable number of deaths worldwide.

- According to the World Health Organization, over half of the world's population is now at risk of dengue, with an estimated 100-400 million illnesses occurring each year.
- According to the National Center for Vector Borne Disease Control, there were 1,93,245 dengue cases and 346 fatalities registered across the country in 2021.
- More than 30,000 individuals were infected with dengue last year, with the number soaring during the monsoon season.
- There has also been an increase in the spread of the infection to the rural areas – with rural India accounting for up to 45 per cent cases by 2021 up from 32 per cent in 2015,
- Every year, from July to November, there is an increase in dengue fever cases, owing mostly to water logging and unsanitary conditions. The illness has a seasonal pattern, which indicates that the peak occurs after the monsoon.
- Dengue virus is spread by the bite of a female Aedes mosquito. Aedes is a day feeder with a limited range of 400 meters. Dengue mosquitoes can't breed once the temperature falls below 16 degrees.

Factors responsible for spread of Dengue

- **Mosquito Vector:** Dengue is primarily transmitted by the Aedes aegypti mosquito, which thrives in urban and semi-urban areas of India. The mosquito breeds in stagnant water sources like uncovered water storage containers, discarded tires, and puddles, making it easy for them to reproduce and spread the disease.
- **Urbanization and Population Density:** Rapid urbanization, unplanned construction, and population growth in cities contribute to increased human-mosquito contact, creating favorable conditions for dengue transmission. Crowded urban areas with inadequate sanitation and waste management systems provide ample breeding grounds for mosquitoes.
- **Climate and Weather:** Dengue transmission is influenced by climatic factors. India's tropical and subtropical climate, with high temperatures and humidity, provides an ideal environment for the mosquito vector to thrive and reproduce. Monsoon seasons, characterized by heavy rainfall and water accumulation, further facilitate mosquito breeding.
- **Lack of Awareness and Education:** Insufficient knowledge and awareness about dengue prevention among the general public, healthcare providers, and policymakers contribute to the spread of the disease. Lack of awareness about vector control measures, such as eliminating mosquito breeding sites and using protective measures, hampers effective prevention.
- **Inadequate Vector Control Measures:** Inconsistent implementation of mosquito control measures, including larval source reduction, insecticide spraying, and fogging, leads to the persistence of mosquito breeding sites. Limited resources, infrastructure, and coordination among different stakeholders hinder the effectiveness of vector control efforts.
- **Weak Healthcare Systems:** Inadequate healthcare infrastructure, including diagnostic facilities, trained personnel, and timely reporting, pose challenges in accurately diagnosing and managing dengue cases. Delayed diagnosis and lack of prompt treatment can contribute to the severity of the disease and its spread.

Initiatives by the Government to Combat Dengue

- The Government has developed a Long Term Action Plan for the Prevention and Control of Dengue in the nation.
- National recommendations for the clinical management of dengue fever, dengue hemorrhagic fever, and dengue shock syndrome have been published.
- Sentinel Surveillance Hospitals were established, with laboratory assistance, to supplement diagnostic facilities for Dengue in endemic countries.
- National Dengue Day is marked in India on May 16 at the advice of the Ministry of Health and Family Welfare to raise awareness about dengue and to increase preventative measures and readiness for disease control in the country before the transmission season begins.

Conclusion

It is believed that the vaccine, which is projected to be available within two years, will lower the incidence of dengue, the burden of hospitalization, and, most crucially, death.

There is currently no particular therapy for dengue, hence there is an urgent need to develop effective vaccines against dengue viral disease.

First Babies Born In Britain Using DNA From 3 People

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: Science and Technology

Prepp Mains Booster: Science and Technology- developments and their applications and effects in everyday life.

Context:

- Recently, Britain's fertility regulator said the first babies created using an **experimental technique combining DNA from three people** have been born, in an effort to prevent the children from i**nheriting rare genetic diseases.**
- The technique, known as **mitochondrial donation treatment (MDT)**, uses tissue from the eggs of healthy female donors to create **IVF embryos** that are free from harmful mutations their mothers carry and are likely to pass on to their children.
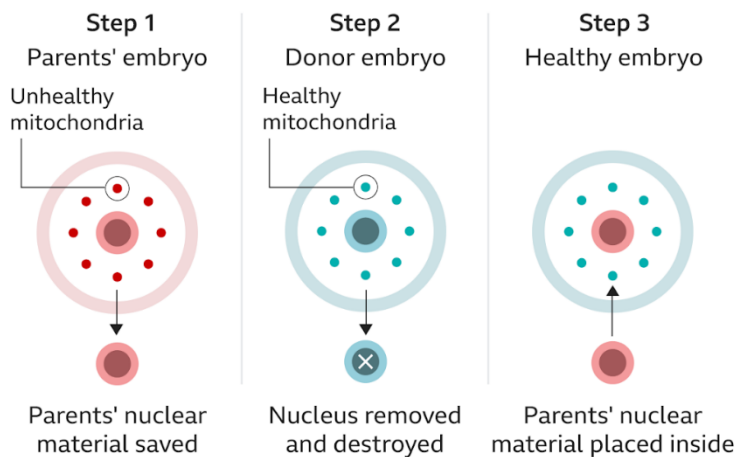
What are Mitochondrial Diseases?

- Mitochondria are basically the **powerhouses of the cells**, they generate the energy and thus are also **responsible for cell function in the human body.**
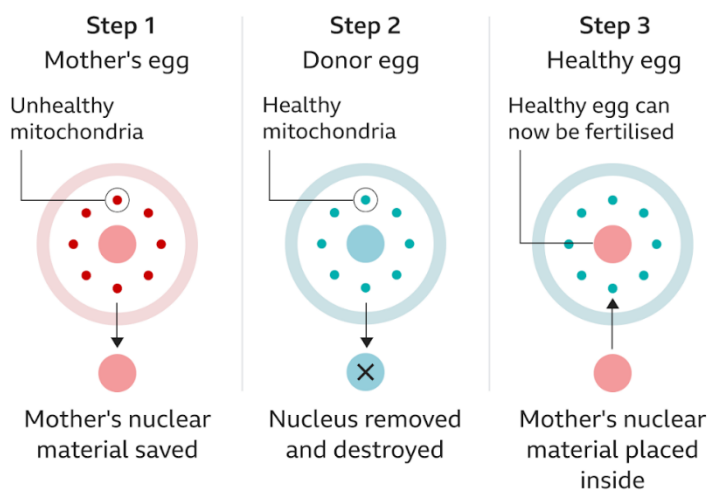
- Certain defects might occur **impacting the way the mitochondria produce energy** for the cells (Specially in the 'energy-hungry' tissues of the brain, nerves, muscles, kidneys, heart, liver), and **thereby impacting cell function.**
- The diseases that arise out of such mitochondrial mutations are called **mitochondrial diseases.**
- When the mitochondria are impaired and **do not produce sufficient energy**, it affects how the organs function, which causes a wide **range of symptom**s across the body, including brain impairment, organ failure, and muscle wastage.
- The symptoms get more and more debilitating as a child grows, and have no cure, but can be treated.
- According to some estimations, one in 5000 people suffer from mitochondrial disorders.

Two ways mitochondrial donation can work

Method 1: Egg repaired after fertilisation

Step 1	Step 2	Step 3
Parents' embryo	Donor embryo	Healthy embryo
Unhealthy mitochondria	Healthy mitochondria	
Parents' nuclear material saved	Nucleus removed and destroyed	Parents' nuclear material placed inside

Method 2: Egg repaired before fertilisation

Step 1	Step 2	Step 3
Mother's egg	Donor egg	Healthy egg
Unhealthy mitochondria	Healthy mitochondria	Healthy egg can now be fertilised
Mother's nuclear material saved	Nucleus removed and destroyed	Mother's nuclear material placed inside

Source: HFEA

B B C

What is the scientific process?

- Mitochondrial diseases are **only passed on by the mother**, and research has been attempting to **find a way out of protecting the infant** from inheriting the disease.

- According to Guardian research on MDT, which is also known as **mitochondrial replacement therapy (MRT)**, was pioneered in the UK by doctors at the Newcastle Fertility Centre to help women with mutated mitochondria to have **babies without the risk of passing on genetic disorders.**
- In this, an **advanced In Vitro Fertilisation technique** developed and refined by the Newcastle Fertility Clinic was used.
- **Mitochondrial Donation Treatment (MDT):** The Newcastle process has several steps. First, sperm from the father is used to fertilise eggs from the affected mother and a healthy female donor.
- The nuclear genetic material from the donor's egg is then removed and replaced with that from the couple's fertilized egg.
- The resulting egg has **a full set of chromosomes from both parents, but carries the donor's healthy mitochondria** instead of the mother's faulty ones. This is then implanted in the womb.
- The procedure is not without risks. Recent research has found that in some cases, the tiny number of abnormal mitochondria that are inevitably carried over from the mother's egg to the donor egg can multiply when the baby is in the womb. So-called reversion or reversal could lead to a disease in the child. "The reason why reversal is seen in the cells of some children born following MRT procedures, but not in others, is not fully understood,
- **This process is termed Mitochondrial Donation Treatment (MDT).**
- This is specifically only for couples who wish to have their genetic child and are not okay with using a donor egg.
- With this special process, the final cytoplasm (which holds the genetic material and mitochondria) has healthy mitochondria while the genetic material belongs to the biological parents."
- Progress in research led the UK government to amend the law allowing the procedure in 2015, and it was two years later that the Newcastle clinic became the first centre to get a license to perform it, and the first few cases were approved in 2018.
- It is possible that a small amount of the maternal mitochondria with errors may get passed on during the procedure.
  o The UK is not the first country to create babies from MDT. In 2016, a US doctor announced the world's first MDT birth after treating a Jordanian woman who carried mitochondrial mutations that cause a fatal condition called Leigh syndrome

NHRC Flags Rise In Child Abuse Content On Social Media

Priority: Medium

Primary Source: The Hindu
Prepp Prelims Booster: NHRC
Prepp Mains Booster: Government policies and interventions, Issues related to children

Context:

- The **National Human Rights Commission (NHRC)** has taken suo motu cognizance of a media report citing a 250-300% surge in the dissemination of **Child Sexual Abuse Material (CSAM)** on social media in India.
- According to the NHRC, the content is of foreign origin, and Indian inquiry authorities have not come across any Indian-made CSAM so far.

What is Child Sexual Abuse?

- The World Health Organization (WHO) defines it as "the involvement of a child in sexual activity that he or she does not fully comprehend and is unable to give informed consent to, or for which the child is not developmentally prepared, or else that violates the laws or social taboos of society."
- This implies that even showing a youngster a pornographic film or befriending the child online and asking for images of, say, the child's private parts constitutes child sexual abuse.
- **Child Sexual Abuse Material (CSAM)** typically involves children under the age of 18 and portrays them engaged in sexual activities or poses. It is a form of child exploitation and is illegal in most jurisdictions around the world.
- The production, distribution, possession, and viewing of CSAM are criminal offenses aimed at protecting children from harm and preventing the further victimization of minors.
- **CSAM is a "violation of human rights relating to citizens' life, liberty, and dignity,"** and it is critical to safeguard young children "from the danger of sexual abuse on social media."

Sexual Abuse Status in India

- According to the NHRC, about 4,50,207 cases related to the spread of child sexual abuse material have been reported in the year 2023, so far.
  - Delhi Police has taken action in 3,039 of these instances, while 4,47,168 are still being investigated.
- In some cases, photographs of young children taken lovingly by respective fathers, brothers, and sisters in India have been classified as child sexual abuse.
  - There were 2,04,056 recorded cases in 2022, 1,63,633 in 2021, and 17,390 in 2020."

About National Human Rights Commission

- National Human Rights Commission is a statutory body, established under the Protection of Human Rights Act, 1993.
- The commission is the watchdog of human rights in the country.
- The commission is responsible for the protection and promotion of "rights to life, liberty, equality and dignity of the

individual guaranteed by the Constitution or enshrined in the International Covenants".

To read more about this topic, click National Human Rights Commission.

Government's Action to combat distribution of Child Sexual Abuse Material (CSAM)

- **Megh Chakra:** Operation 'Megha Chakra' is a quick response to internationally linked online child sexual exploitation and organized cyber financial crime. The CBI is conducting a pan-India campaign against the circulation and sharing of Child Sexual Abuse Material (CSAM).
- **Aarambh India:** It is a non-governmental organization that collaborated with the Internet Watch Foundation in the United Kingdom to develop India's first online reporting facility for reporting photographs and videos of child abuse.
- **National cybercrime reporting portal:** The Ministry of Home Affairs (MHA) has established a national cybercrime reporting platform where people may file online complaints about child pornography and gang rape.
- **CyberTipline:** The National Crime Records Bureau formed an agreement with the National Centre for Missing and Exploited Children (NCMEC) in the United States to accept CyberTipline complaints in order to enable action against individuals who upload or disseminate CSAM in India.
- **The Rajya Sabha's ad hoc Committee** issued broad suggestions on the concerning problem of pornography on social media and its impact on children and society as a whole.

Way Forward

- Abuse preventive activities, as well as the construction of secure online environments for children, should be prioritized, and all parties involved in child protection should collaborate to significantly improve the response.
- Creating a comprehensive outreach system that includes parents, schools, communities, NGO partners, local governments, as well as police and attorneys, to ensure that the legal framework, policies, national strategies, and standards are better executed.

- Governments should enact and enforce stringent laws against the production, distribution, and possession of CSAM. Law enforcement agencies need to be adequately trained and equipped to investigate and prosecute offenders.
- Social media platforms have a crucial role in preventing the spread of CSAM. They should have robust policies and mechanisms in place to detect and remove such content promptly. Regular audits and transparency reports can help ensure compliance.

MoU Signed To Connect 7 Religious Sites

Priority: Medium

Primary Source: The Hindu

Prepp Prelims Booster: 'Riverine Based Religious Tourism Circuit'
Prepp Mains Booster: Infrastructure, Waterways

Context:

- Recently, a memorandum of understanding was signed for a **'Riverine Based Religious Tourism Circuit'** to connect seven ancient temples, enhancing religious tourism in Northeast India.
- The **project is being developed under the Sagarmala Programme.**

Riverine Based Religious Tourism Circuit

- A Memorandum of Understanding (MoU) was signed to develop a **'Riverine Based Religious Tourism Circuit'** between the Inland Waterways Authority of India (IWAI), Sagarmala Development Corporation Limited (SDCL), Assam Tourism Development Corporation (ATDC), and the Department of Inland Waterways Transport (DIWT), Government of Assam.
- The main goal of the MoU is to construct a contemporary ferry service that will operate on a 'Hop-On Hop-Off' basis to connect seven **historically significant temples on the banks of the Brahmaputra.**
  o **Kamakhya, Pandunath, Ashwaklanta, Doul Govinda, Umananda, Chakreshwar, and Auniti Satra are among these locations.**
- The project's successful implementation is poised to unlock the potential of riverine tourism and bolster the tourism sector in Assam.
- The funding for the project will be shared among the Sagarmala Development Corporation Limited (SDCL), the Inland Waterways Authority of India (IWAI), and the Assam Tourism Development Corporation (ATDC).

What is the significance of the sites?

- **Kamakhya:** The Kamakhya Temple, also known as Kamrup-Kamakhya, is a Hindu temple dedicated to the mother Goddess Kamakhya. It is one of the oldest of the 51 Shakti Pithas.

- **Pandunath:** It is located on the banks of mighty Brahmaputra on the foothills of Nilachal Hills. Maharaj Pandu was the father of the five Pandavas. The Tila Hills has a temple dedicated to Pandu (the Pandunath temple). The five Ganesha idols meet here, leading the five Pandavas. The five brothers are believed to have taken refuge here as Ganesha during exile.
- **Aswaklanta:** It is a famous Hindu temple situated on the bank of the mighty River Brahmaputra, in the district of kamrup in Assam. Because of the presence of two Lord Vishnu sculptures, the temple has a distinct personality of its own. Lord Krishna's horses were tired and rested here, giving the place its name.
- **Doul Govinda:** It is located on the northern banks, near the slopes
- of Chandra Bharati hill in Rajaduar, North Guwahati. The temple is primarily dedicated to Lord Krishna.
- **Umananda:** This temple is dedicated to Lord Shiva and is located in the midst of the Brahmaputra River. Every year during the Shivratri festival, a great number of worshippers visit this temple.
- **Chakreshwar:** It is a well-known Lord Vishnu temple. The temple's uniqueness is an impression of Lord Vishnu's Chakra (weapon) naturally etched into a big rock.
- **Auniti Satra:** Sri Sri Auniati Satra held the highest position among the Satras of Assam. It was located in Majuli, a slightly elevated land abundant with Auni Paan. The name Auniati Satra originated from the term "Ati" meaning elevated place. The Satra Temple, known as Manikuta, houses the idol of Lord Krishna, called Govinda. The idol was originally brought from Jagannath Kshetra (Puri, Orissa) and ceremoniously installed with Vedic rituals.
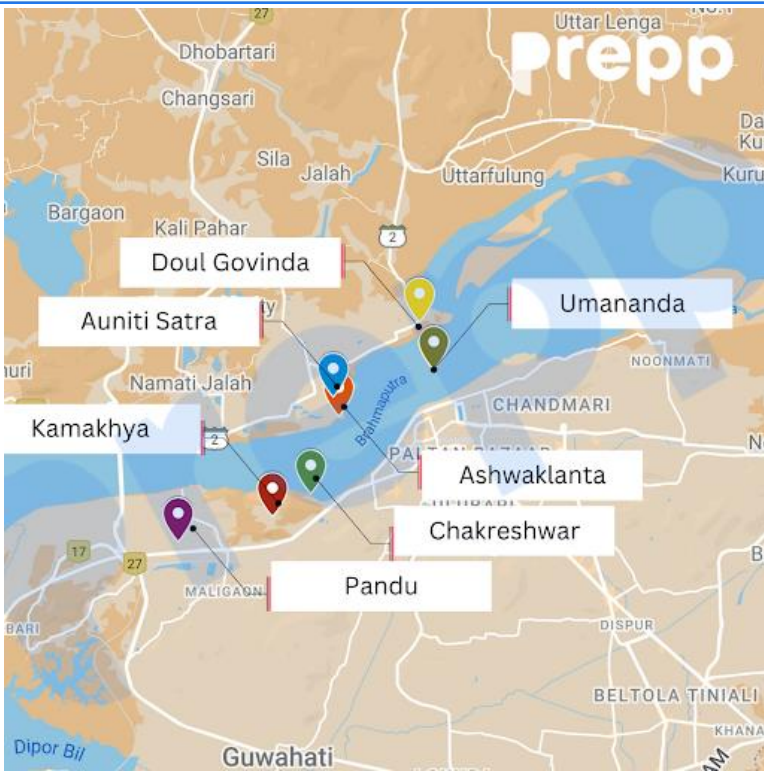
What is the Sagarmala Project?
- The Sagarmala project aims to build a series of ports along India's coastline.
- This initiative's goal is to foster "port-led development" throughout India's 7500-kilometer-long coastline.
- Its goal is to provide access to new growth zones through multimodal solutions and the promotion of the optimal modal split, as well as increased connection to major economic centers and beyond, through expanding rail, inland water, coastal, and road services.
- The Union Ministry of Shipping has been designated as the initiative's nodal ministry.
- State governments will establish State Sagarmala committees, led by the chief minister or the minister in charge of ports, to carry out this plan.

About the Brahmaputra River
- The Brahmaputra River rises in southern Tibet and shares its headwaters with the Indus and Sutlej rivers.
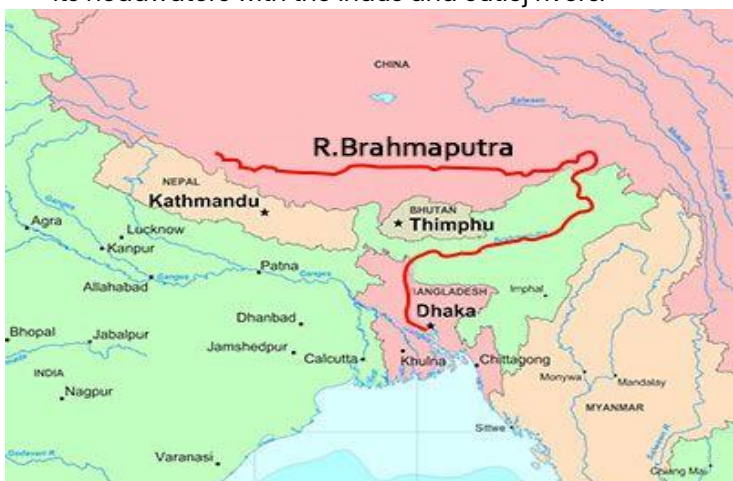
- It runs through a depression produced by the Indus-Tsangpo Structure Zone, passing through the Himalayas and into Arunachal Pradesh as the Dihang River.
- It becomes the Brahmaputra after joining the Lohit and Dibang streams.
- The Dhansiri, Lohit, and Dibang rivers feed the river's left bank, while the Subansiri, Kameng, Manas, and Sankosh rivers feed the river's right bank.

Common Uniform For Brigadiers And Above Rank Officers In Army From August 1

Priority: Low

Primary Source: The Hindu

Prepp Prelims Booster: Current events of national and international importance.

Prepp Mains Booster: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

Context:
- Recently, the Indian Army has decided that brigadiers and above rank officers will have a common uniform from August 1 irrespective of their parent cadre and appointment.
- The decision was taken after detailed deliberations during the recently concluded Army Commanders Conference and extensive consultations with all stakeholders.

How will the uniforms worn by these senior Army officers change?
- All officers of the rank of Brigadier, Maj General, Lt General, and General will now wear berets (caps) of the same colour, common badges of rank, a common belt **buckle, and a common pattern of shoes.**
- They will **no longer wear regimental lanyards (cords)** on their shoulders.
- They will **also not wear any shoulder flashes like 'Special Forces'**, 'Arunachal Scouts', 'Dogra Scouts', etc.
- Thus, there will be **no item of uniform that will identify** them as belonging to a **particular Regiment or Corps.**
- All officers of these higher ranks will dress alike in the same pattern of uniform.

What is the reason for making the change?

- **Common Identity:** A standard uniform will ensure a common identity for all officers of senior rank while reflecting the true ethos of the Indian Army.
- This will also reinforce the Indian Army's character to be a fair and equitable organisation.
- **Check on Favoritism:** Most officers promoted to the rank of Colonel no longer engage in regimental service.Consequently, all uniform affiliations with that particular Regiment or Corps must also end at that rank to ensure that **any Regimental favoritism is not promoted to the higher ranks.**
- The senior officers in charge of these troops should present themselves in a **neutral uniform rather than a regimental one**, as appointments at higher ranks sometimes entail leading troops with **mixed regimental lineage.**
- **Reverting to old practice:** The army is reverting to a practice that was followed about four decades ago when changes towards wearing regimental affiliations began in the army.
- Till the mid-1980s, the regimental service was till the rank of Lt Colonel.
- Officers rank Colonel and above had common uniform patterns and insignia.

Places in News - India

Wayanad
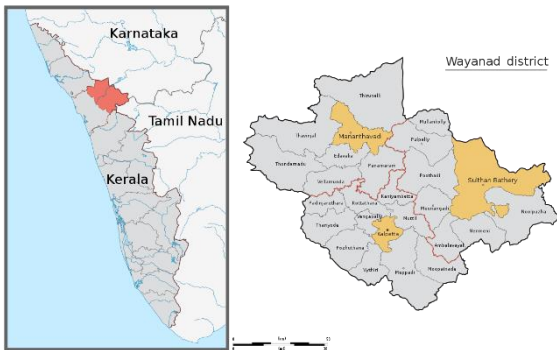
Reason to be in news: Recently, Wayanad became the first district in the country to be declared ODF (open defecation-free) Plus. **Wayanad** is a district in the north-east of Indian state Kerala with administrative headquarters at the municipality of Kalpetta. It is the only plateau in Kerala. The Wayanad Plateau forms a continuation of the Mysore Plateau, the southern portion of Deccan Plateau which links Western Ghats and Eastern Ghats.

Manipur

Reason to be in news: Recently, Manipur witnessed clashes between two ethnic groups Kuki-Zomi tribals and the largely Hindu Meiteis, for the first time in three decades. **Manipur is a state in northeast India,** with the city of Imphal as its capital. It is bounded by the Indian states of Nagaland to the north, Mizoram to the south and Assam to the west. It also borders two regions of Myanmar, Sagaing Region to the east and Chin State to the south.

Kuno National Park

Reason to be in news: Recently, the Union Environment Ministry stated that five more cheetahs (three females and two males) will be released from acclimatization camps at Kuno National Park (KNP) into "free-roaming conditions" before the start of the monsoon rains in June. Kuno National Park is a national park and wildlife sanctuary in Madhya Pradesh, India. It takes its name from the Kuno River. It was established in 1981 as a wildlife

sanctuary with an initial area of 344.686 km2 in the districts of Sheopur and Morena. It was designated a national park in 2018.

Western Ghats

Reason to be in news: The Palghat Gap, which is often called a significant discontinuity in the Western Ghats, is around 40 km wide and flanked by the steep Niligiri and Annamalai hills on either side. The **Western Ghats** is one of the world's eight biodiversity hotspots, spanning six states: Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu, and Kerala. It is designated as a UNESCO World Heritage Site. It is one of the world's eight "hottest hotspots" of biological variety.


Western Ghats
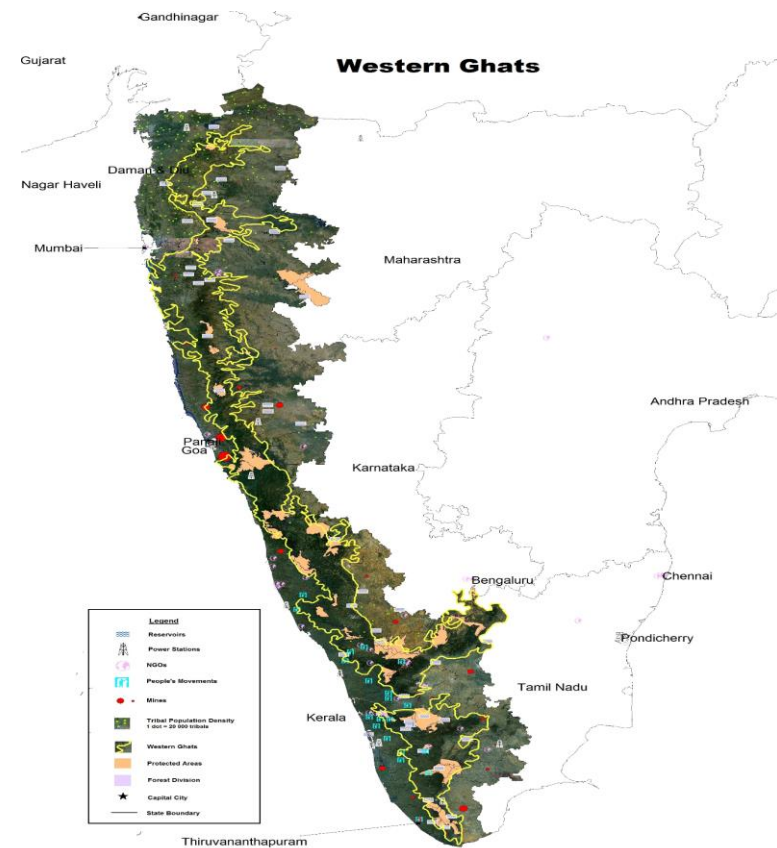
Harike Wetland

Reason to be in news: Recently, a gharial has been seen in Pakistan's Punjab province for the first time in three decades and could have been from a population reintroduced on India's side of the Radcliffe Line in 2017. **The Harike wetland** is the confluence of the Beas and the Satluj which are two of the three eastern rivers of the Indus river system. The waters of the Ravi, Beas, and Satluj have been allotted to India according to the 1960 Indus Waters Treaty. It is one of the largest wetlands in Northern India, located in the Tarn Taran and Ferozepur districts of Punjab.

Krishnarajasagar Dam

Reason to be in news: Recently, an analysis published in the Science journal revealed that more than 30 large lakes in India recorded a drying trend between 1990 and 2020. 16 of the 30 lakes are major lakes of South India including the Krishnarajsagar, Nagarjuna Sagar, Idamalayar, and Mettur. Krishna Raja Sagara, also popularly known as KRS, is a lake and the dam that creates it. They are close to the settlement of Krishna Raja Sagara in the Indian State of Karnataka.
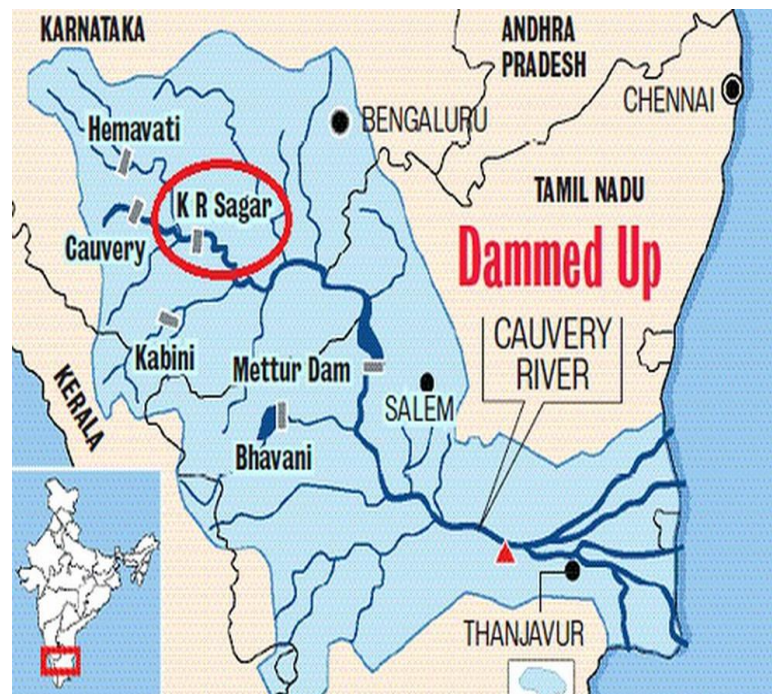

Krishna River

Reason to be in news: Recently, at the Krishna River Management Board meeting, Telangana reiterated that it would not accept the 34:66 (TS: AP) ratio implemented since the bifurcation of Andhra Pradesh for one more year. **The Krishna or**

the Krishnaveni is the third longest river in India (1,288 km) and the fourth largest in terms of water flows and river basin area. It is also the second-largest east-flowing river in peninsular India. It originates in the Western Ghats in the Satara district of Maharashtra, near Mahabaleshwar and flows into the Bay of Bengal. The Krishna's basin covers the South Indian states of Andhra Pradesh, Telangana, Maharashtra, and Karnataka.


Navegaon Nagzira Tiger Reserve (NNTR)

Reason to be in news: The Navegaon Nagzira Tiger Reserve (NNTR) has witnessed a modest increase in tiger population, with a tigress giving birth to four pups in the restricted region. The Nawegaon Nagzira Tiger Reserve (NNTR) is located in Maharashtra's districts of Gondia and Shandara. It was designated a Wildlife Sanctuary in 1970. In 2012, the state administration announced the merger of this sanctuary with another national park to be included in the Tiger Project, which is now known as Nagzira Navegoan Tiger Reserve.
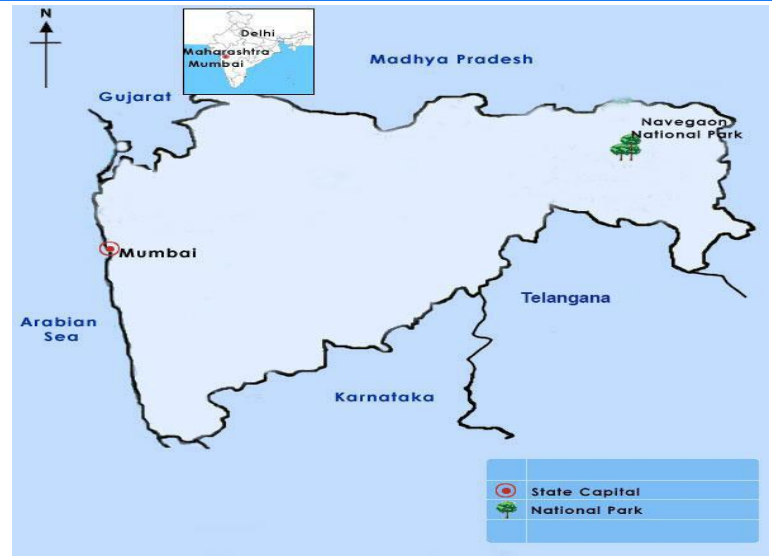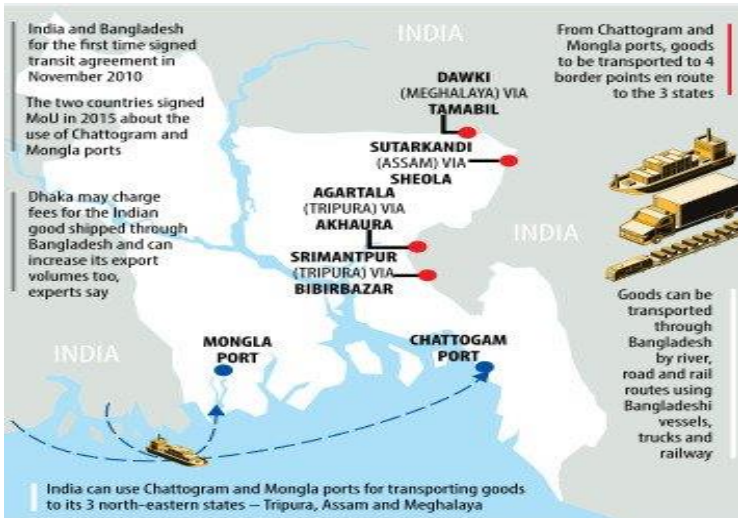

Bandhavgarh Tiger Reserve

Reason to be in news: Bandhavgarh Tiger Reserve recently acquired a unique addition to its fauna when 16 female and two male swamp deer were released into an enclosure erected in the BTR's Magadhi zone. **Bandhavgarh Tiger Reserve is located in the Umaria district of Madhya Pradesh,** India. It has a land size of roughly 105 square kilometers and is located in the Umaria district's Vindhya Hills.
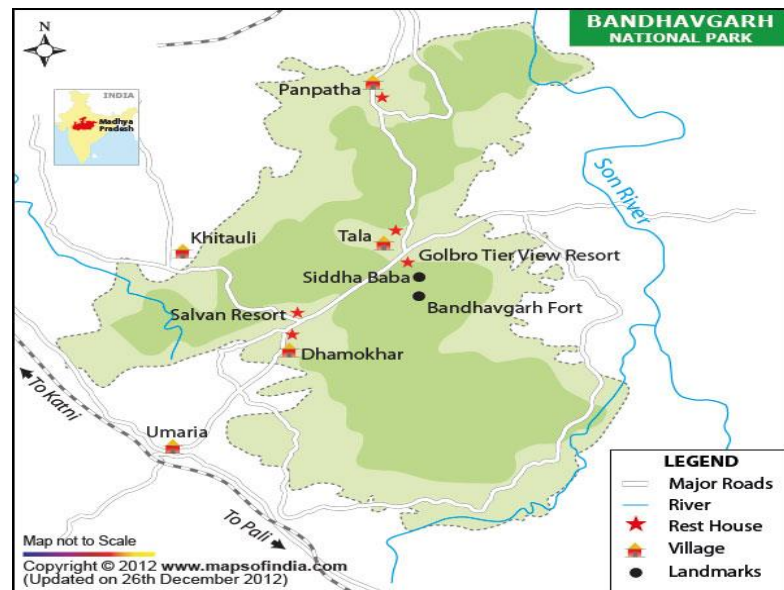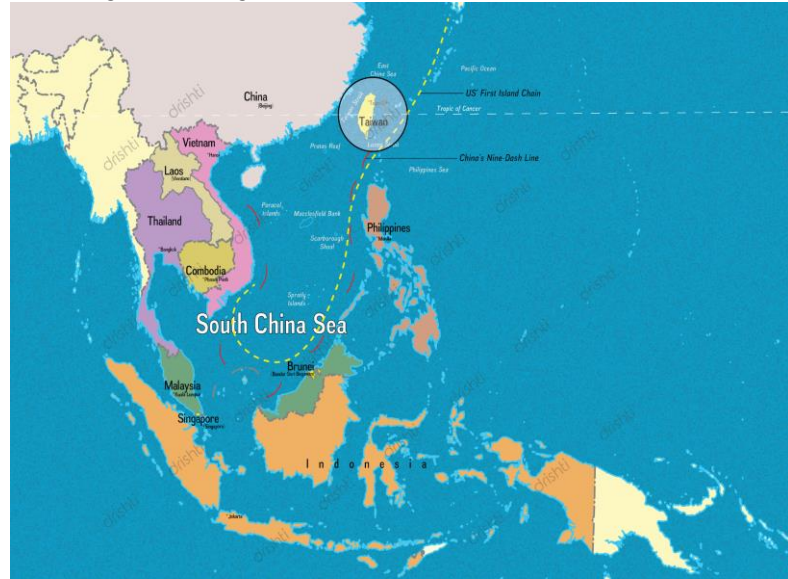

Dawki Land Port

Reason to be in news: Union Minister Nityanand Rai opened the Dawki Land Port in Meghalaya's West Jaintia Hills area to enhance trade and commerce between India and Bangladesh. The Dawki Land Port is located in West Jaintia Hills, Meghalaya, roughly 55 kilometers from the Jowai district headquarters and around 84 kilometers from the state capital, Shillong.

India can use Chattogram and Mongla ports for transporting goods to its 3 north-eastern states — Tripura, Assam and Meghalaya

Places in News - World

Russia

Reason to be in news: Recently, a senior government official stated that dividends worth $300-400 million payable to Indian oil companies from their investments in Russian oil and gas projects are delayed due to payment channel-related issues caused by the Russian invasion of Ukraine. Russia is a transcontinental country spanning Eastern Europe and Northern Asia. It is the largest country in the world, encompassing one-eighth of Earth's inhabitable landmass.

South China Sea

Reason to be in news: The inaugural ASEAN-India Maritime Exercise (AIME-2023) will commence in Singapore, with the sea phase taking place in the South China Sea.

The South China Sea is one of the world's busiest waterways, serving as a crucial commercial and maritime transportation route. The South China Sea is a marginal sea of the Western

Pacific Ocean. It is bounded in the north by the shores of South China, in the west by the Indochinese Peninsula, in the east by the islands of Taiwan and northwestern Philippines, and in the south by the Indonesian islands of Borneo, eastern Sumatra and the Bangka Belitung Islands.

South Korea

Reason to be in news: Recently, the leaders of South Korea and Japan met for their second summit in Seoul in less than two months. They pushed to mend long-running historical grievances and boost ties against North Korea's nuclear program and other regional challenges. **South Korea** is a country in East Asia. It constitutes the southern part of the Korean Peninsula and borders North Korea along the Korean Demilitarized Zone. The country's western border is formed by the Yellow Sea, while its eastern border is defined by the Sea of Japan.

West Asia

Reason to be in news: Recently, National Security Advisers (NSAs) of the US, India, and the UAE met with Saudi Prince and Prime Minister Mohammad Bin Salman in Saudi Arabia to discuss a shared vision of a more secure and prosperous Middle East region interconnected with India and the world. The summit in Saudi Arabia was organized to explore a plan to connect nations in West Asia via rail networks and highways. **The West Asia region comprises 12 member countries:** Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, State of Palestine, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen.

Suez Canal

Reason to be in news: Recently, Russian President Vladimir Putin and his Iranian counterpart Ebrahim Raisi signed a pact to finance and develop an Iranian railway line as part of an emerging international North-South Transport Corridor. **Suez Canal** is a constructed sea-level canal that runs north to south through Egypt's Isthmus of Suez to connect the Mediterranean Sea with the Red Sea. The canal connects the African continent to Asia and provides the shortest marine route between Europe and the regions around the Indian and Western Pacific seas.

Papua New Guinea

Reason to be in news: Recently, the United States signed a new security pact with Papua New Guinea (PNG) as it competes with China for influence in the Pacific.

The Independent State of Papua New Guinea in the South Pacific shares a land-border with Indonesia. The nation is the world's third biggest island country.

Boundaries: Australia to the south and the Solomon Islands to the east. It is located just south of the Equator.