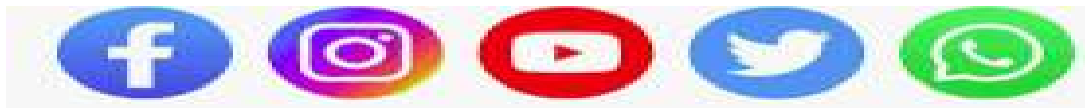


VAID ICS LUCKNOW

UPSC (Pre)- 2024 /25
(Important Current Affairs)
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Why in News? : The Core Heatwave Zone (CHZ)/ When the IMD declares a heatwave?

The April Month 2024 has experienced heat-waves that was more severe than previous year. While the southern peninsular and the southeastern coast areas have been the worst affected, the northern plains are yet to experience heatwave conditions this season.

The Core Heatwave Zone (CHZ) spanning central, north, and peninsular India between Gujarat and West Bengal is prone to heatwave conditions every year, during the summer season March to June and occasionally in July.

Rajasthan, Punjab, Haryana, Chandigarh, Delhi, West Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Odisha, Vidarbha in Maharashtra, parts of Gangetic West Bengal, coastal Andhra Pradesh, and Telangana are the most heatwave-prone states or regions.

When does IMD declare a heatwave?

- IMD declares a heatwave when the normal maximum temperature recorded over at least two localities in plains touches **40 degree Celsius or exceeds 4.5 degree Celsius from normal**.
- Heatwave is declared in hilly and coastal regions when temperatures cross 30 degree Celsius and 37 degree Celsius respectively.
- A severe heatwave is declared if the temperature departure exceeds **6 degree Celsius from normal**.

GIFT CITY/ foreign portfolio investor (FPI):

Why in News? The Securities and Exchange Board of India (Sebi) recently allowed non-resident Indians (NRIs) to own up to 100 per cent in **global funds at the GIFT City** and gave passive funds more exposure to group companies. Currently, NRIs and **Overseas Citizens of India (OCIs)** cannot own more than 50 per cent in a **foreign portfolio investor (FPI)**.

- The move could pave the way for greater flows from the Indian diaspora into the domestic stocks.
- “A 100 per cent contribution limit shall be available subject to the FPI submitting copies of Permanent Account Number (PAN) cards of all their NRI/OCI individual constituents, along with their economic interest in the FPI,” the markets regulator said.
- Market experts believe a more liberalised regime for NRI/OCIs could lead to twin benefits — boost the fund ecosystem at the GIFT City as well as attract genuine flows from overseas Indians.

At present, the combined holdings of NRIs and OCIs in a global fund must be less than 50 per cent, while that of a single NRI or OCI is capped at 50 per cent.

“The conditions set forth for this increased participation are meticulously designed to balance the need for flexibility with the imperative of managing regulatory risk,” said Suresh Swamy, partner at Price Waterhouse & Co. Moreover, such FPIs will still have to adhere to the granular disclosure norms on economic interest and ultimate ownership issued by the regulator in August last year.

KEY DECISIONS :

NRIs, OCIs coming via GIFT City to greater exposure to domestic equities >

IMPLICATION:

At present, the combined holdings of NRIs, OCIs in a global fund has to be less than 50 per cent. The move will allow NRIs, OCIs to own up to 100% in a global fund domiciled at IFSCs.

Passive funds allowed 35% exposure to group companies of sponsor:

IMPLICATION: Currently, an MF is not allowed to invest over 25% of corpus in group firms of the sponsor. This can lead to tracking error for ETFs. More investment legroom will allow passive funds, ETFs mimic the index performance better.

About Foreign Portfolio Investors (FPIs):

They are entities, typically institutional investors, that invest in financial assets such as stocks, bonds, and other securities in a country other than where they reside. FPIs include foreign institutional investors (FIIs), qualified foreign investors (QFIs), and foreign venture capital investors (FVCIs).

FPIs:

1. **Investment Approach:** FPIs invest in financial assets with the objective of earning returns. They usually have a diversified portfolio across various asset classes and sectors.
2. **Regulation:** FPIs are regulated by the regulatory bodies of the country in which they invest. Regulations typically govern the maximum amount of investment allowed in various sectors, disclosure requirements, and investment restrictions.
3. **Impact on Financial Markets:** FPIs play a significant role in the financial markets of the countries in which they invest. Their buying and selling activities can influence asset prices, market liquidity, and overall market sentiment.
4. **Economic Impact:** FPI flows can have both positive and negative effects on the economy. While FPI inflows can provide capital to fund investment and stimulate economic growth, sudden outflows can lead to currency depreciation and financial instability.
5. **Taxation:** Taxation of FPIs varies depending on the country and the type of investment. Some countries offer tax incentives to attract FPIs, while others impose taxes on capital gains, dividends, or interest income earned by FPIs.

6. **Risks:** FPI investments are subject to various risks, including market risk, currency risk, political risk, and regulatory risk. FPIs often conduct thorough research and analysis before making investment decisions to mitigate these risks.

What is GIFT City?

- It stands for Gujarat International Finance Tec-City. It's India's first operational smart city and international financial services center (IFSC), located in the state of Gujarat.
- The city was designed to promote financial services and other related industries on a global scale.
- It aims to provide world-class infrastructure, services, and regulatory environment to businesses operating in finance, banking, insurance, and capital markets. GIFT City is envisioned as a hub for international finance, similar to global financial centers like Dubai, London, and Singapore.

Artificial General Intelligence (AGI)

Why in News? Sam Altman, CEO of OpenAI, has recently expressed his commitment to invest billions of dollars towards the development of Artificial General Intelligence (AGI).

What is AGI?

- AGI is a kind of machine or a software that can perform any intellectual task that a human can do.
- It can do reasoning, common sense, abstract thinking, background knowledge, transfer learning, ability to differentiate between cause and effect, etc.
- AGI aims to emulate human cognitive abilities such that it allows it to do unfamiliar tasks, learn from new experiences, and apply its knowledge in new ways.

How it will Work?

- Humans learn through their experiences — in school, home, or elsewhere; by talking to people or observing things; by reading books, watching television, reading articles, etc. The human brain then uses the information it has gathered to make decisions (often subconscious) that solve any given problem, or come up with a new one.
- With AGI, researchers aim to build a software or computer that can do all this — everything that a human computer does. Think of having a super intelligent robot friend who can understand everything you say, learn new things just the way you do, and even think of problems to find solutions.

How is AGI different from AI we already use?

- The main difference between AGI and the more common form of AI, also known as **narrow AI**, lies in their scope and capabilities.
- Narrow AI is designed to perform specific tasks such as image recognition, translation, or even playing games like chess—at which it can outdo humans, but it remains limited to its set parameters. On the other hand, AGI envisions a broader,

more generalised form of intelligence, not confined to any particular task (like humans).

Is this a new idea?

- No. The idea of AGI first emerged in the 20th century with a paper written by **Alan Turing**, widely considered to be the father of theoretical computer science and artificial intelligence.
- In 'Computing Machinery and Intelligence' (1950), he introduced what is now known as the **Turing test**, a benchmark for machine intelligence. Simply put, if a machine can engage in a conversation with a human without being detected as a machine, according to the Turing test, it has demonstrated human intelligence.

When Turing wrote this influential paper, humans were nowhere close to developing artificial intelligence — even computers were in their nascency. Yet, his work led to wide-ranging discussions about the possibility of such machines, as well as their potential benefits and risks.

How can AGI help humanity?

- In theory, AGI has innumerable positive implications. For instance, in healthcare, it can redefine diagnostics, treatment planning, and personalised medicine by integrating and analysing vast datasets, far beyond the capabilities of humans.
- In finance and business, AGI could automate various processes and enhance the overall decision-making, offering real-time analytics and market predictions with accuracy.

Types of Artificial Intelligence:

Weak AI or Narrow AI:

- Narrow AI is a type of AI which is able to perform a dedicated task with intelligence. The most common and currently available AI is Narrow AI in the world of Artificial Intelligence.
- Narrow AI cannot perform beyond its field or limitations, as it is only trained for one specific task. Hence it is also termed as weak AI. Narrow AI can fail in unpredictable ways if it goes beyond its limits.
- Apple Siri is a good example of Narrow AI, but it operates with a limited pre-defined range of functions.
- IBM's Watson supercomputer also comes under Narrow AI, as it uses an Expert system approach combined with Machine learning and natural language processing.
- Some Examples of Narrow AI are playing chess, purchasing suggestions on e-commerce site, self-driving cars, speech recognition, and image recognition.

General AI:

- General AI is a type of intelligence which could perform any intellectual task with efficiency like a human.
- The idea behind the general AI is to make such a system which could be smarter and think like a human by its own.

- Currently, there is no such system exist which could come under general AI and can perform any task as perfect as a human.
- The worldwide researchers are now focused on developing machines with General AI.
- As systems with general AI are still under research, and it will take lots of efforts and time to develop such systems.

Super AI:

- Super AI is a level of Intelligence of Systems at which machines could surpass human intelligence, and can perform any task better than human with cognitive properties. It is an outcome of general AI.
- Some key characteristics of strong AI include capability include the ability to think, to reason, solve the puzzle, make judgments, plan, learn, and communicate by its own.
- Super AI is still a hypothetical concept of Artificial Intelligence. Development of such systems in real is still world changing task.

Artificial Intelligence type-2: Based on functionality

Reactive Machines:

- Purely reactive machines are the most basic types of Artificial Intelligence.
- Such AI systems do not store memories or past experiences for future actions.
- These machines only focus on current scenarios and react on it as per possible best action.
- IBM's Deep Blue system is an example of reactive machines.
- Google's AlphaGo is also an example of reactive machines.

Limited Memory:

- Limited memory machines can store past experiences or some data for a short period of time.
- These machines can use stored data for a limited time period only.
- Self-driving cars are one of the best examples of Limited Memory systems. These cars can store recent speed of nearby cars, the distance of other cars, speed limit, and other information to navigate the road.

Theory of Mind:

- Theory of Mind AI should understand the human emotions, people, beliefs, and be able to interact socially like humans.
- This type of AI machines are still not developed, but researchers are making lots of efforts and improvement for developing such AI machines.

Self-Awareness:

- Self-awareness AI is the future of Artificial Intelligence. These machines will be super intelligent, and will have their own consciousness, sentiments, and self-awareness.
- These machines will be smarter than human mind.
- Self-Awareness AI does not exist in reality still and it is a hypothetical concept.

The India Employment Report 2024: Unemployment in India & Challenges

Why in News? The India Employment Report 2024 was brought out by the Institute for Human Development (IHD) and the International Labour Organisation (ILO).

The unemployment rate rises with a rise in education levels, There is 28 per cent unemployment rate among graduates and above (the proportion of women being higher).

What the report says?

- Employment quality has improved in all states
- There is an increase in the share of non-farm employment (and decline in agriculture employment)
- **the female workforce participation (FWFP) rate has increased** from 24.5 per cent in 2019 to 37.0 in 2023
- In comparison to the wages of regular workers, the wages of casual workers increased even during 2019-22.
- Unemployment and underemployment rates increased till 2018 but declined thereafter. The unemployment rate has declined from **6 per cent 2018 to 3.2 per cent in 2023**. This also holds for the youth unemployment rate, which also decreased from 17.8 per cent to 10 per cent over this period.
- Despite an improvement in employment conditions over time, jobs largely remain informal and of lower productivity. Over 90 per cent employment is informal, and 83 per cent are in the informal sector.

Way forward & recommendation of the report:

The report has recommended some policy measures such as

- (a) making production and growth more employment-intensive with emphasis on labour-based manufacturing and appropriate focus on employment-generating services and agriculture;
- (b) improving the quality of jobs;
- (c) overcoming labour market inequalities, particularly by boosting women's employment and effective policies to tackle NEET;
- (d) making systems for skills training and active labour market policies more effective, particularly by bridging the supply-demand gap in jobs and active involvement of the private sector; and
- (e) generating reliable statistics so as to better capture the complexities of the changing pattern of labour market due to rapid technological change.

About The International Labour Organization (ILO)

- It was established in 1919
- Headquarter: Geneva
- It is devoted to promoting social justice and internationally recognized human and labour rights.

- It brings together governments, employers and workers of **187 Member States**, to set labour standards, develop policies and devise **programmes promoting decent work for all women and men**.

About International Labour Conference:

The Conference sets the international labour standards and the broad policies of the ILO. It meets annually in Geneva. Often called an international parliament of labour, the Conference is also a forum for discussion of key social and labour questions.

What is Sikhs for Justice (SFJ)?

Why in News? Delhi Lieutenant-Governor V K Saxena has recommended a National Investigation Agency (NIA) probe against jailed Delhi Chief Minister Arvind Kejriwal for allegedly receiving political funding from Sikhs for Justice (SFJ).

- The World Hindu Federation, a diaspora-based Hindu advocacy organisation has alleged that Kejriwal's Aam Aadmi Party received **\$16 million from SFJ** for **"facilitating the release** of Devinder Pal Bhullar and espousing pro-Khalistani sentiments".

What is Sikhs for Justice (SFJ)?

- It was formed in 2007, a US-based group seeking a separate homeland for Sikhs — a **"Khalistan" in Punjab**.
- Gurpatwant Singh Pannun, a law graduate from Panjab University and currently an attorney at law in the US, is the face of SFJ and its legal adviser. The secessionist campaign, called **'Referendum 2020'**, seeks to **"liberate Punjab from Indian occupation"**.
- In Pannun's words, **"SFJ in its London Declaration [in August 2018] has announced to hold the first ever non-binding referendum among the global Sikh community on the question of secession from India and re-establishing Punjab as an independent country.**

SFJ is banned in India:

- India refers to Pannun as a terrorist, and has banned SFJ under the Unlawful Activities (Prevention) Act, 1967.
- The Home Ministry's 2019 notification issuing the ban says: **"In the garb of the so-called referendum for Sikhs, SFJ is actually espousing secessionism and militant ideology** in Punjab, while operating from safe havens on foreign soils and actively supported by inimical forces in other countries."
- Currently, almost a dozen cases are registered against Pannun and SFJ in India.

GST Appellate Tribunal (GSTAT) : What is Revenue Neutral Rate (RNR) ?

Why in News? The Goods and Services Tax (GST) collections as a percentage of Gross Domestic Product (GDP) have reached pre-GST levels.

- The FM said that it is a myth that all GST collections are “pocketed by the Centre”, adding that GST contributes significantly to state revenues.
- The statement by Sitharaman came on the day of her having administered the oath to Justice (Retd) Sanjaya Kumar Mishra as the President of the **GST Appellate Tribunal (GSTAT)**.

What are key points of her address:

- Despite the GST rate being less than the prescribed Revenue Neutral Rate and COVID-19 affecting the revenues, GST collections (**as a % of GDP**) have now reached the levels they were before **GST (both net and gross)**.
- This demonstrates that the Centre & States, collectively, through better tax administration, are able to collect the same revenue with a lower burden on our taxpayers.
- GST contributes significantly to state revenues – States receive **100 per cent of SGST** collected in that state, approx.
- **50 per cent of IGST** (i.e. on inter-state trade). A significant portion of CGST, i.e., **42 per cent**, is devolved to the states based on the Finance Commission's recommendations.
- GST has improved tax buoyancy from **0.72 (pre-GST) to 1.22 (2018-23)**. Despite compensation ending, state revenues remain buoyant at 1.15.
- The **Revenue Neutral Rate** was suggested to be **15.3 per cent but was lower at 14.4 per cent** in 2017, and it has come down to 11.6 per cent in 2019.

What is the GST Appellate Tribunal?

The GST Appellate Tribunal represents a specialised authority formed to resolve GST-related disputes at the appellate level. It will be the forum of second appeal under GST laws and is the first common forum of dispute resolution between the Centre and the states.

Composition:

- GST Appellate Tribunal Composition includes a National Bench situated in New Delhi and constituting the President (Head), a Judicial Member, and Technical Members, one from the state and another from the Centre.
- There may be state benches consisting of two **Judicial Members, a Technical Member (Centre) and a Technical Member (state)**.

Power:

- The Tribunal is not bound by the **Code of Civil Procedure, 1908**, but follows the principles of **natural justice and has the authority to regulate its own procedure**.

- The Tribunal possesses powers similar to a **civil court under the Code of Civil Procedure, 1908**, for matters such as summoning individuals, demanding document production, and receiving evidence on affidavits.

Members:

- The government selects members for the GST Appellate Tribunal, including a Judicial Member and two Technical Members (one for the Centre and one for the state).
- The president must be a **Supreme Court judge or have served the High Court as the Chief Justice to be considered for the GST Appellate Tribunal**.
- The Judicial member must be a **High Court Judge or has served as an Additional District Judge or a District Judge for a period of 10 years**.

What is Revenue Neutral Rate (RNR) ?

- It is the rate at which tax revenue remains the same despite giving credit of duty paid on inputs and other factors.
- It is the rate of tax that allows the Government to receive the same amount of money despite changes in the tax laws.
- The government of India had appointed a committee which is headed by Dr. Arvind Subramanian. Committee had released a detailed report on the calculation of RNR and the tax structure. RNR is calculated by the committee with three different approaches:-

Macro approach:-

- RNR is calculated on basis of total data for domestic output/net imports and consumption of capital inputs. GST has a positive rate and zero rates on exports are two assumptions under this approach. RNR found to be 11.6% after factoring compliance of GST at 80%.

Indirect tax turnover approach:-

- This Approach was shared by NIPFP(National Institute of Public Finance Policy). There are three steps under this approach:-
- Estimate goods revenue base at the state level.
- Estimate the services revenue base at the national level.
- Adjustments for certain goods & services not to be taxed under GST.
- This approach puts the RNR at 18.86%.

Direct tax turnover approach:

- The approach was shared by the Thirteenth Finance Commission. RNR is calculated on the basis of input tax data of all the registered entities. This approach puts the RNR at 11.98 %. RNR is likely to be selected around 18% after making few changes to the indirect tax turnover approach.



History of religion-based reservations in India

Why in news? In election season, India is debating fundamental constitutional questions around reservation.

- **Can a secular country** like India have religion-based reservation?
- **Have Muslims ever been given reservation** by reducing the quota for Scheduled Castes (SCs), Scheduled Tribes (STs), or Other Backward Classes (OBCs)?
- **Does reservation for SCs that is limited to only certain religious** denominations amount to reservation based on religion?

What the Indian Constitution says on religion-based reservations?

- As per the constitution of India, Equality refers to equal treatment for all, to equity, which ensures fairness and may require differential treatment or special measures for some groups.
- The Supreme Court has held that equality is a **dynamic concept** with many aspects and dimensions, and it cannot be “**cribbed, cabined and confined**” within traditional and doctrinaire limits (**E P Royappa vs State Of Tamil Nadu, 1973**).
- The Constitution of 1949 dropped the word ‘minorities’ from **Article 296** of the draft constitution (**Article 335** of the present Constitution), but included **Article 16(4)** that enabled the state to make “any provision for ...reservation...in favour of any backward class of citizens which...is not adequately represented in the services under the state”.
- The first constitutional amendment inserted **Article 15(4)**, which empowered the state to make “any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes”.
- **Article 15** specifically prohibits the state from discriminating against citizens on grounds only of both religion and caste (along with sex, race, and place of birth). After the Supreme Court’s judgment in **State of Kerala vs N M Thomas (1975)**, reservation is considered not an exception to the equality/ non-discrimination clauses of **Articles 15(1) and 16(1)**, but as an extension of equality.
- The crucial word in **Articles 15 and 16** is ‘only’ — which implies that if a religious, racial, or caste group constitutes a “weaker section” under **Article 46**, or constitutes a backward class, it would be entitled to special provisions for its advancement.

Mandal commission and other states' Reservation Policy:

- The Mandal Commission, following the example set by several states, included a number of Muslim castes in the list of OBCs. The Supreme Court in **Indra Sawhney (1992)** laid down that any social group, whatever its mark of identity, if found to be backward under the same criteria as others, will be entitled to be treated as a backward class.

Kerala: Muslim sub-quota:

- Religion-based reservation was **first introduced in 1936 in Travancore-Cochin** state. In 1952, this was replaced by communal reservation. Muslims, who constituted 22% of the population, were included within the OBCs.
- After the state of Kerala was formed in 1956, all Muslims were included in one of eight sub-quota categories, and a sub-quota of 10% (now 12%) was created within the OBC quota.

Karnataka: JD(S) decision:

- The Third Backward Classes Commission of Karnataka headed by Justice O Chinnappa Reddy (1990) found, like the **Havanur (1975) and Venkataswami (1983)** Commissions, that Muslims fulfilled the requirements for being considered among the backward classes.
- In 1995, the Deve Gowda government implemented 4% Muslim reservation within the OBC quota. Thirty-six Muslim castes which are part of the central list of OBCs were included in the quota.

Tamil Nadu:

- The government provided within the 30% OBC quota, a sub-category of Muslims with 3.5% reservation.

Andhra Pradesh & Telangana:

- In 2004, based on a report by the Commissioner of Minority Welfare on the social, economic, and educational backwardness of Muslims, the government provided 5% reservation, treating the entire community as backward.

What courts have said?

- Based on **M R Balaji vs State of Mysore (1962)**, the court noted that “Muslims or for that matter Christians and Sikhs etc., are not excluded for the purpose of conferring the benefits under **Articles 15(4) or 16(4)**”.
- In **M R Balaji**, the **Supreme Court observed**: “It is not unlikely that in some States some Muslims or Christians or Jains forming groups may be socially backward.
- That is why though castes in relation to Hindus may be a relevant factor to consider in determining the social backwardness of groups or classes of citizens, it cannot be made the sole or the dominant test in that behalf.

In **Indra Sawhney (1992)**, the **Supreme Court** held that “in a particular state, Muslim community as a whole may be found socially backward. (As a matter of fact, they are so treated in Karnataka as well as Kerala).

What is Formal Vs Substantive equality?

Formal equality is based on an understanding of equality as identical or same treatment. By treating others who are **alike identically or the same**, they will be subject to the same rules or standards.

- For example, if we are looking at the ground of sex, men and women should be treated identically in all spheres of life. This some people **believe results in fair treatment** because you

treat everyone exactly the same.

However, substantive equality does not mean treating everyone identically or the same. It means treating persons differently so as to achieve equal results.

- As human beings have differences and are multifaceted beings, it is important to take into account different factors such as **their race, age, sex, etc.**, that may make their situation sufficiently different so as to require different treatment in order for them to be **treated fairly and with equal respect**. Sometimes treating everyone exactly the same results in injustice.

What are auroras? What are northern and southern lights?

Why in News? Recently, the night sky was lit up by northern lights, or aurora borealis, at Hanle village in Ladakh early . Northern lights were also witnessed in other parts of the world, including in the United States and the United Kingdom. Meanwhile, southern lights, or aurora australis, were spotted in countries such as New Zealand and Australia.

What are auroras?

- Auroras are essentially natural lights that appear as bright, swirling curtains in the night sky and can be seen in a range of colours, including blue, red, yellow, green, and orange.
- These lights primarily appear near the poles of both the northern and southern hemispheres all year round but sometimes they expand to lower latitudes .
- As mentioned before, in the north, the display is called the aurora borealis; in the south, it is known as the aurora australis.

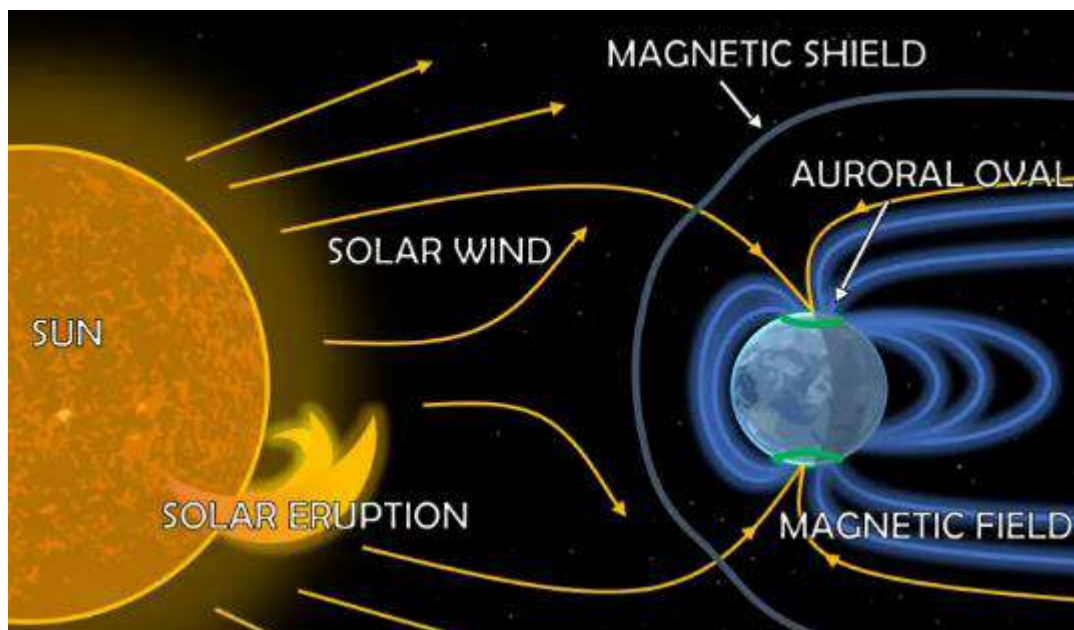
What causes Auroras?

Sun's Activity: The sun constantly emits a stream of charged particles called the solar wind. Sometimes, the sun has bursts of intense activity called solar storms, which release even greater amounts of these particles.

Earth's Magnetic Field: Our planet is surrounded by a magnetic field that shields us from most of the sun's particles. However, the field is weaker at the poles.

Particles Collide with Atmosphere: When a solar storm hits, some of the charged particles travel down the magnetic field lines towards the north and south poles. These particles collide with atoms and molecules in Earth's atmosphere, causing them to get excited.

Light Show: As the excited atoms and molecules relax back to their normal state, they release energy in the form of light, creating the colorful auroras. The color depends on the type of gas molecule that was struck. Oxygen glows green and red, while nitrogen gives off blue and purple hues.



What is 4 R strategy ?

Why in News? Government banks have earned record profits so far in the financial year 2023-24. During this period, the total profit of 12 banks increased to Rs 1,42,129 crore. These banks had earned a record profit of Rs 1.05 lakh crore in 2022-23. In 2021-22 this figure was Rs 66,540 crore. During this period, there was a decline in the profits of only three banks, UCO, Indian Overseas and Punjab and Sindh Bank.

The profits of banks have increased due to the '**4 R**' strategy of the government. This includes transparent identification of NPAs, resolution and recovery, recapitalization and financial system reforms. Under this strategy, the government has infused a total of **Rs 3.11 lakh crore capital** into banks between 2016-17 and 2020-21. This has helped the banks.

The second reason is continuous recovery and reduction in bad loans i.e. NPA. The effect of this was that during the financial year 2023-24, the net NPA of all banks came down to below the level of 1.70 percent. **Bank of Maharashtra's NPA was the highest at 0.20 percent, while Punjab and Sindh Bank's NPA was the highest at 1.63 percent.**

What is '4 R' strategy?

- The 4 R in Indian banking refer to a strategy implemented by the government to address bad loans (Non-Performing Assets or NPAs) in **Public Sector Banks (PSBs)**. It's a framework to clean up bank finances and improve their health.

The 4 R:

- **Recognition (R-1):** This involves transparently acknowledging the true extent of bad loans on the banks' books. Previously, some NPAs might have been hidden or understated.
- **Resolution (R-2):** This focuses on finding solutions to recover the money owed on bad loans. It involves methods like restructuring debt, selling off assets of the borrower, or taking legal

action.

- **Recapitalization (R-3):** This step involves infusing fresh capital into the PSBs to strengthen their financial position. This helps them absorb losses from bad loans and improve their lending capacity.
- **Reforms (R-4):** This focuses on long-term improvements in the banking system to prevent future bad loans. It includes stricter loan approval processes, better risk management practices, and governance reforms in PSBs.

What is Bank Run ? Reasons/ Examples

Why in news? The term bank run was in news recently.

What is Bank run? A bank run happens when a large number of depositors withdraw their money from a bank at the same time because they fear the bank is going bust (failing). It's a self-fulfilling prophecy in a way, as the mass withdrawal can actually cause the bank to run out of cash, even if it was initially healthy.

Causes:

Loss of confidence: The primary trigger is a loss of depositor confidence in a bank's stability. This can be caused by rumors, news reports about the bank's financial problems, or a general economic downturn.

Fractional-reserve banking: In most countries, banks only keep a fraction of deposited money as actual cash on hand. They lend out the rest to earn interest. During a bank run, if too many people withdraw their money at once, the bank might not have enough cash reserves to meet all the demands.

Examples:

Great Depression (1929-1933): This period saw a wave of bank runs in the US as many banks collapsed due to risky investments and a weak economy. The FDIC (Federal Deposit Insurance Corporation) was created in response to prevent future bank runs by insuring deposits up to a certain limit.

Northern Rock (2007): This British bank became the first major casualty of the 2008 financial crisis. Depositors panicked and withdrew their funds, leading to the bank's nationalization.

Impact:

Bank failure: A bank run can quickly deplete a bank's cash reserves, forcing it to limit withdrawals or even shut down completely.

Economic crisis: Widespread bank runs can cripple an entire financial system and lead to a broader economic recession.

Government intervention: To prevent bank runs, governments often step in with emergency measures like deposit insurance guarantees or liquidity injections for banks.

Prevention:

Deposit insurance: This government-backed program ensures depositors get their money back (up to a limit) if their bank fails.

Regulation: Stricter banking regulations can help prevent risky lending practices that contribute to bank failures.

Transparency: Clear communication from banks about their financial health can help maintain depositor confidence.

India & Chabahar port: Recent development ,Significance & Challenges

Why in news ? India and Iran have recently signed a 10-year contract for the operation of a terminal at the strategically important Chabahar port in Iran.

What is Chabahar?

It is a deep water port in **Iran's Sistan-Baluchistan province**. It is the Iranian port that is the closest to India, and is located in the open sea, providing easy and secure access for large cargo ships.



The strategic and economic importance of Iran's Chabahar port will be greatly enhanced by its integration with the planned INSTC corridor (in red).

Significance for India:

Access to Afghanistan and Central Asia: Pakistan restricts land access for Indian trade with Afghanistan and Central Asia. Chabahar provides India with a bypass route, facilitating trade and investment in these regions.

Gateway to Eurasia: The port serves as a crucial link in the International North-South Transport Corridor (INSTC), connecting India to Europe through Iran and Central Asia. This reduces transportation costs and time for trade.

Energy Security: India can diversify its oil and gas import routes through Chabahar, lessening dependence on traditional sources.

Geopolitical Influence: Developing Chabahar strengthens India's presence in the region and fosters ties with Iran, a key player in the Middle East.

Economic Development: The project creates jobs and opportunities for businesses in both India and Iran. It can also act as a hub for humanitarian aid distribution in the region.

Progress after 2015:

- While India spent about \$100 million to construct a 218-km road from Delaram in western Afghanistan to Zaranj on the Iran-Afghan border to link with Chabahar, the port project itself progressed at a glacial pace. But things started to change in 2015 after talks between Iran and the P-5+1 bore fruit.
- About three weeks after Iran and the world powers announced their framework deal on April 2, 2015, and committed to finalising a comprehensive deal by the end of June, then Afghan President Ashraf Ghani visited India and stressed the importance of the Chabahar port.
- Over the next one year, coordination between the three countries led to the signing of a **Trilateral Agreement to establish the International Transport and Transit Corridor** in May 2016.

Recent Developments :

- India has so far supplied six mobile harbour cranes (two of 140-tonne and four of 100-tonne capacity) and other equipment worth \$25 million.
- IPGL has been operating Chabahar port through its wholly owned subsidiary, India Ports Global Chabahar Free Zone (IPGCFZ), since December 24, 2018.
- The port has handled more than **90,000 twenty-foot-equivalent units (TEUs)** of container traffic and more **than 8.4 million metric tonnes (MMT) of bulk and general cargo** since then.
- The port has also facilitated the supply of humanitarian assistance, especially during the Covid-19 pandemic.
- Till date, a total of **2.5 million tonnes of wheat and 2,000 tonnes of pulses have been trans-shipped from India to Afghanistan through Chabahar port**. In 2021, India supplied **40,000 litres of the environment friendly pesticide (malathion)** through the port to Iran to fight locust attacks.

Chabahar & INSTC:

Chabahar Port and the International North-South Transport Corridor (INSTC) are intertwined initiatives with significant strategic and economic benefits for India.

What is INSTC?

- The INSTC is a multi-modal transportation route aiming to connect the Indian Ocean and the Persian Gulf to the Caspian Sea and onward to Northern Europe. It involves transporting goods through a combination of sea, road, and rail networks.

How does Chabahar fit in?

Chabahar Port, located in southeastern Iran on the Gulf of Oman, acts as a critical entry and exit point for the INSTC in the Indian Ocean region.

Sea Link: Goods can be shipped from India to Chabahar Port, providing access to Iran and beyond.

Land Bridge: From Chabahar, cargo can be transported overland through Iran to Bandar-e Anzali on the Caspian Sea.

Caspian Sea and Beyond: Ships can then carry the goods across the Caspian Sea to ports in Russia and further on to Europe via railways.

Benefits of Chabahar for INSTC:

Faster Route: The INSTC route via Chabahar bypasses the Suez Canal, potentially saving up to 15 days on shipments between India and Europe.

Cost Reduction: Reduced transportation time translates to lower costs for businesses involved in trade between India, Central Asia, Russia, and Europe.

Connectivity Boost: Chabahar strengthens the INSTC's viability, promoting increased trade flows and economic activity along the corridor.

Challenges:

US Sanctions: US sanctions on Iran can make it difficult for companies to invest in infrastructure and logistics required for smooth INSTC operations.

Regional Instability: Security concerns in Afghanistan and the broader region can disrupt the movement of goods along the corridor.

Developing Infrastructure: Upgrading infrastructure like roads and railways across Iran and Central Asia is needed to fully optimize the INSTC's potential.

Chabahar serves as a strategic anchor for the INSTC in the Indian Ocean region. While challenges exist, successful development of both initiatives can significantly enhance India's connectivity and trade prospects **with Central Asia, Russia, and Europe.**

Fertigation

Why in News? This was recently in news regarding its significance & scope in India

What is Fertigation?

Fertigation is a technique that combines irrigation and fertilization in agriculture. It involves delivering dissolved fertilizers directly to the root zone of plants through an irrigation system, typically drip irrigation.

Benefits:

Increased Efficiency: Compared to traditional broadcasting of fertilizers, fertigation delivers nutrients directly to the roots, reducing waste and maximizing uptake by plants.

Precision: Fertigation allows for controlled application of nutrients, ensuring plants receive the right amount at the right time. This can lead to improved crop yields and quality.

Water Conservation: By delivering water and nutrients together, fertigation can help reduce overall water usage, especially beneficial in dry regions.

Reduced Labor Costs: Fertigation can be automated, saving time and labor compared to manual fertilizer application.

Process:

Soluble Fertilizers: Fertigation utilizes water-soluble fertilizers that can be easily dissolved and injected into the irrigation system.

Delivery System: Drip irrigation is the most common method for fertigation as it delivers water and nutrients directly to the root zone, minimizing waste.

Nutrient Management: Fertigation allows for adjustments in fertilizer concentration based on crop needs and soil conditions.

Suitability:

High-Value Crops: Fertigation is often used for high-value crops like vegetables, fruits, flowers, and turfgrass where precise nutrient management is crucial for optimal growth and yield.

Controlled Environments: Fertigation is well-suited for greenhouses and hydroponic systems where water and nutrient delivery can be tightly controlled.

Challenges of Fertigation in Agriculture:

Fertigation, the practice of delivering fertilizers with irrigation water, offers several benefits but also comes with its own set of challenges:

High Initial Investment: Setting up a fertigation system requires drip irrigation infrastructure, fertilizer injectors, and monitoring equipment. This can be expensive for small and marginal farmers.

Technical Expertise: Using fertigation effectively requires knowledge about fertilizer types, application rates, and crop nutrient needs. Farmers might need training to adjust fertilizer application based on soil conditions and different growth stages of crops.

Clogging Issues: Improper mixing of fertilizers with water or using incompatible fertilizers can lead to clogging of drippers and emitters in the irrigation system. Regular maintenance is crucial.

Water Quality: Fertigation systems are sensitive to water quality. Salty or impure water can damage the system and affect fertilizer solubility. Pretreatment of water might be necessary in some cases.

Environmental Concerns: Over-fertilization due to improper management can lead to nutrient leaching into groundwater, potentially causing pollution. Careful monitoring and proper application rates are essential.

Countries Practicing Fertigation:

Fertigation is practiced worldwide, but its adoption varies depending on factors like economic development, water availability, and government policies. Here are some examples:

Developed Countries: Widely used in countries like the United States, Israel, Spain, and Italy, particularly for high-value crops like fruits, vegetables, and flowers.

Developing Countries: Gaining traction in countries like India, China, Brazil, and Mexico, especially in areas facing water scarcity. Government subsidies and initiatives can promote its adoption.

Future Potential: With increasing water scarcity and focus on precision agriculture, fertigation is expected to see wider adoption globally, especially with advancements in automation and sensor technology.

About Precision farming:

Precision farming, also known as precision agriculture, is a modern approach to farming that uses technology and data to optimize crop production and resource management.

Benefits:

Increased Yields: By precisely tailoring practices to field conditions and crop needs, precision farming can lead to higher crop yields.

Reduced Costs: Optimize resource use like water, fertilizers, and pesticides, minimizing waste and saving money.

Improved Sustainability: Precision practices can minimize environmental impact by reducing excess water usage and chemical runoff.

Enhanced Decision-Making: Data analysis helps farmers make informed decisions about planting, fertilization, pest control, and harvesting.

Improved Farm Management: Tools and data provide insights into farm performance, allowing for better planning and resource allocation.

Challenges:

High Initial Investment: Precision farming technologies like GPS systems, sensors, and data analysis software can be expensive, especially for small farms.

Technical Expertise: Using these technologies effectively requires training and knowledge to interpret data and make informed decisions.

Data Security and Privacy: Concerns exist around data security and ownership of the collected farm data.

Reliance on Technology: Technical breakdowns or lack of internet connectivity can disrupt farming operations.

Limited Accessibility: Small and marginal farmers may not have the resources or infrastructure to adopt precision farming practices readily.

Practices:

Field Mapping: Utilizing GPS and satellite imagery to create detailed maps of fields, identifying variations in soil quality, drainage, and crop health.

Variable Rate Technology (VRT): Applying fertilizers, pesticides, and irrigation water at precise rates based on specific needs of different areas within a field.

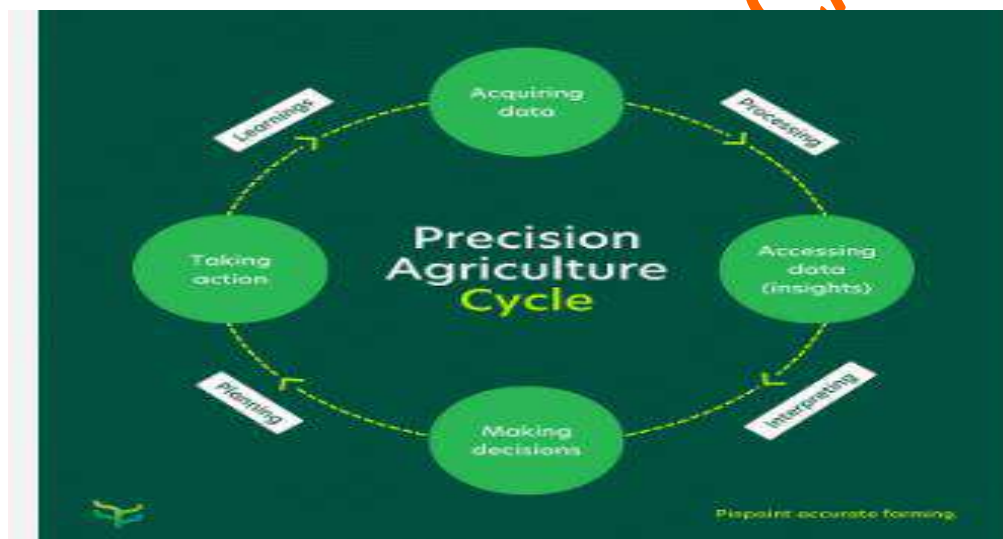
Yield Monitoring: Using sensors and GPS to track crop growth and yield variations across the field, helping identify areas that need attention.

Drone Technology: Drones equipped with cameras and sensors can capture aerial images and data for field analysis and crop health monitoring.

Precision Irrigation Techniques: Using drip irrigation or sprinkler systems with sensors to deliver water directly to plant roots, minimizing waste

Examples:

In India, pressurized micro irrigation system, drip system specifically, and site-specific nutrient management are considered as 'Precision Farming'.



India's Forest Cover has increased: UNFF

Why in news ? India's forest cover saw a consistent increase over the last 15 years, the Ministry of Environment, Forest and Climate Change (MoEFCC) said at the recently concluded United Nations Forum on Forests (UNFF) in the US.

Key points:

- Globally, **India ranks third in the net gain**, in average annual forest area, between 2010 and 2020.
- The country also marked 50 years of **Project Tiger** and 30 years of **Project Elephant**, underscoring its commitment to species conservation and habitat protection.

- The creation of the **International Big Cat Alliance**, along with the introduction of the 'Green Credit Programme,' to incentivise entities to take up tree plantation and restoration of degraded forest lands.

About the United Nations Forum on Forests (UNFF):

- It is basically a high-level committee that deals with international forest policy. Here's a breakdown of its key features:

Function: Promote the management, conservation, and sustainable development of all types of forests around the world.

Powers:

- It sets international forest policy goals and milestones.
- It reviews progress made towards those goals.
- It provides a platform for international cooperation on forest issues.

Members: Includes all member states of the United Nations, plus specialized agencies and observer groups.

Headquarters: New York City, USA (under the UN Economic and Social Council)

The **International Big Cat Alliance**:

The International Big Cat Alliance (IBCA) is a big deal for big cat conservation efforts. Launched by India in April 2023, it's a global alliance specifically focused on protecting the world's seven big cat species:

- Tiger
- Lion
- Snow Leopard
- Leopard
- Jaguar
- Puma
- Cheetah

Global Collaboration: IBCA brings together 97 countries, including many from Asia and Africa, to tackle big cat conservation as a united front. This allows for sharing best practices, faster assistance between neighboring countries, and a stronger voice for big cat protection on the international stage.

Unified Strategies: The alliance aims to develop **standard operating procedures (SOPs)** for all member nations. These SOPs will serve as a guide for big cat conservation efforts, ensuring a more coordinated and effective approach across different countries.

Combating Threats: A key focus of IBCA is tackling illegal wildlife trade and poaching, which are major threats to big cat populations. The alliance plans to create a clear set of guidelines for member countries to follow, helping them clamp down on these illegal activities.

Financial Sustainability: The Indian government has pledged **\$100 million in initial funding** to support the IBCA for its first five years. After that, the alliance aims to be self-sustaining through membership fees, contributions from organizations, and support from the private sector.

India VIX Index :What is the Volatility Index?

Why in News? India VIX, which is an indicator of the market's expectation of volatility over the near term, surged past the 21 mark .

- The rise shows that fear among traders or market participants on the expected volatility is more now, as compared to 15 days earlier.
- Currently, the fear among the market players is coming from the outcome of the ongoing Lok Sabha elections.

About the Volatility Index:

- It is also known as the VIX, is an indicator of the stock market's expectation for volatility in the coming 30 days. It's calculated by the Chicago Board Options Exchange (CBOE) based on the prices of S&P 500 index options.

What the VIX tells us:

Market Volatility: A high VIX reading suggests investors expect significant price swings in the S&P 500, either up or down. This is often associated with periods of uncertainty or fear in the market. Conversely, a low VIX indicates expectations of calmer markets with smaller price movements.

Investor Sentiment: The VIX can be seen as a gauge of investor sentiment. When the VIX rises, it suggests investors are becoming more fearful and anxious. A decline in the VIX might signal a more complacent or optimistic market.

Trading Tool: While not directly tradable itself, the VIX is a valuable tool for investors and traders. It can be used to:

Manage Risk: Investors can adjust their portfolio allocations based on the VIX reading. During high VIX periods, they might shift towards less risky assets.

Identify Trading Opportunities: Some traders use VIX levels to identify potential entry and exit points for their positions.

Other key points :

- The VIX is a forward-looking indicator, meaning it reflects expectations for future volatility, not what's happening currently.
- The VIX is not perfect in predicting future market movements.
- There are other factors besides the VIX that can influence investment decisions.

Testing of Ethylene Oxide

Why in news ? India has made the testing and sampling of Ethylene Oxide (EtO) residue for all spice shipments to Singapore and Hong Kong from May 7 mandatory.

- By citing presence of pesticide, **ethylene oxide** , **Hong Kong** on April 5 banned four products of Indian manufacturers **MDH Pvt. and Everest Food Products Pvt.**
- The products included MDH's Madras curry powder, sambhar masala mixed masala powder and curry powder mixed masala powder and Everest's fish curry masala.

- Following Hong Kong's move, the Singapore Food Agency (SFA) on April 18 ordered the recall of **Everest's fish curry masala** after the food regulator found presence of ethylene oxide at a level which is "not fit for human consumption"

What the officials said on It?

- The rejection rate of spices is less than **1 per cent of the total quantity** exported by us to major countries. India exported about **14.15 million tonne of spices** in FY24 and 200 kg is a small quantity that has been recalled.
- **EtO is a fumigant type of product** that is used during transportation and that some amount of pesticide is allowed in the process of food management.
- **Different countries** also have prescribed varying limits of chemicals that can be present in food.

About Ethylene oxide:

- It is a versatile chemical compound with a wide range of applications, though it's important to note it can also be hazardous. Here's a breakdown:
- What is Ethylene Oxide?
- It's a flammable, colorless gas at room temperature with a faintly sweet odor.
- Highly reactive, which makes it useful in many industrial processes but also a safety concern.
- Applications of Ethylene Oxide:

Chemical Production: It is a crucial building block for many other chemicals, including antifreeze, detergents, plastics, and pharmaceuticals.

Sterilization: Ethylene oxide gas is a common sterilant used in hospitals and medical facilities to sterilize heat-sensitive medical equipment and other items that cannot withstand high temperatures (e.g., disposable syringes). It's estimated to sterilize billions of medical devices each year.

Other Applications:

- Ethylene oxide has various industrial uses beyond chemical production and sterilization, including:
- In the food and beverage industry for certain applications.
- Manufacturing certain components in batteries for electric vehicles.
- Modifying starches used in various industries.

Safety Considerations:

- Ethylene oxide is flammable, carcinogenic, mutagenic, and irritating.
- Exposure to high levels can cause serious health problems.
- Facilities handling ethylene oxide must have proper safety measures in place.

What is the Palestinian Nakba and why does it matter?

Why in News? The Arabic word **Nakba** means **catastrophe or disaster**. In reference to the Israeli-Palestinian conflict, the term **Nakba** or **al-Nakba** refers to the **Palestinians having lost their homeland during and after the 1948 Arab-Israeli war**.

- It's thought that around 700,000 people in what is now Israel either fled or were forced from their homes. Many Palestinian refugees abroad remain stateless even today.

What is the Palestinian right to return?

- According to the United Nations General Assembly Resolution 194 in 1948, as well as the UN Resolution 3236 in 1974, and the 1951 Convention on the Status of Refugees, Palestinians who are **considered Palestinian refugees have the "right of return."**
- Israel, however, has rejected the "right of return" for Palestinians, stating this would mean an end to Israel's identity as a Jewish state. Israel has denied responsibility for the displacement of Palestinians, pointing out that between 1948 and 1972 around 800,000 Jews were expelled or had to flee from Arab countries like Morocco, Iraq, Egypt, Tunisia and Yemen.

Article 84 of the Indian Constitution

Why in news? The Returning Officer (RO) for the Varanasi Lok Sabha constituency has rejected comedian Shyam Rangeela's nomination on the grounds that it was "incomplete".

Why was Rangeela's nomination rejected?

The affidavit submitted by him was incomplete and he did not take the oath/affirmation and there was some deficiencies in the nomination papers.

What is the oath required to complete the nomination process?

- **As per Article 84** of the Constitution, a citizen who wishes to contest elections must take an oath in the presence of a person authorised by the Election Commission (EC), to bear "true faith and allegiance to the Constitution of India as by law established, and uphold the sovereignty and integrity of India".
- Usually, the RO or the Assistant RO is the authorised person for the purpose of the oath. The EC's Handbook for ROs, 2023, says the **oath or affirmation should be made and subscribed** before the date fixed by the EC for the scrutiny of nominations.

About Article 84 :

Article 84 of the Indian Constitution lays down the qualifications that an individual must possess to become a member of either the **Rajya Sabha** or the **Lok Sabha**.

Qualifications for Membership:

- The individual must be a citizen of India.
- The individual must be at **least 30 years of age for the Rajya Sabha and at least 25 years of age** for the Lok Sabha.
- In the case of the Rajya Sabha, the individual must possess the necessary qualifications prescribed by the Parliament through legislation.
- The individual must not hold any office of profit under the Government of India or the government of any state.
- The individual must not be of **unsound mind**.
- The individual must not be an **undischarged insolvent**.
- The individual must not have been convicted of any criminal offense involving **moral turpitude and sentenced to imprisonment for at least two years**.

Capital market reform 2.0 / Bloomberg Bond Index

Why in News? The Chief Economic Adviser V Anantha Nageswaran has recently said that the country needs further **capital market reform 2.0** to meet the growing needs of the economy.

He said that India will be entering into the **JP Morgan government bond index**. We have to deal with that and subsequently, starting in January 2025, we will also be part of the **Bloomberg bond index**.

What is Bloomberg Bond Index?

The Bloomberg Bond Index, also recently referred to as the **Bloomberg Aggregate Bond Index (Agg)**, is a widely recognized benchmark for the U.S. investment-grade bond market.

Focus: It tracks the performance of a broad range of investment-grade, fixed-income securities issued in the United States. These include:

- Government bonds
- Government-related bonds
- Corporate bonds
- Asset-backed securities (ABS)
- Mortgage-backed securities (MBS)
- Maturities typically range from 1 to 10 years

Market Capitalization Weighted: The index is weighted by the market value of outstanding bonds. This means bonds issued by larger entities have a greater influence on the overall index performance.

Benchmark: The Agg serves as a benchmark for various financial instruments, including:

- Bond mutual funds
- Exchange-traded funds (ETFs) that track the bond market
- The performance of actively managed bond portfolios

Importance: By tracking the Agg, investors can gauge the overall health and performance of the U.S. investment-grade bond market. Deviations from the index's movement can indicate broader economic trends or investor sentiment.

Variations: Bloomberg offers various sub-indices that focus on specific segments of the U.S. bond market, such as the **Bloomberg US Corporate Bond Index** or the **Bloomberg US Treasury Bond Index**.

Global Perspective: While the Agg focuses on the U.S. market, Bloomberg also has indices for global and other regional bond markets.

About J.P. Morgan bond indices:

J.P. Morgan offers several government bond indices, but the two main categories are:

1.Developed Markets Indices: These track fixed-rate issuances from high-income countries spanning the globe. Here are two prominent examples:

J.P. Morgan Government Bond Index (GBI) series: This is a flagship product that includes various sub-indices like GBI Global (covering major developed economies) and GBI Broad (covering a wider range of developed countries).

J.P. Morgan EMU Government Bond Index: This focuses on euro-denominated government debt issued by investment-grade countries within the Eurozone.

2.Emerging Markets Indices: These track the performance of local-currency-denominated sovereign bonds issued by emerging market countries. The most relevant one in this context is:

- J.P. Morgan Government Bond Index-Emerging Markets (GBI-EM): This is a widely followed and influential benchmark that includes local currency bonds issued by emerging economies. It has different versions, with the GBI-EM Global Diversified being the most common.

Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC)

Why in News? The term was recently used in an article regarding the climate change.

What is CBDR-RC ?

- It is a principle within the United Nations Framework Convention on Climate Change (UNFCCC) that acknowledges the different capabilities and differing responsibilities of individual countries in addressing climate change.
- The principle of CBDR-RC is enshrined in the **1992 UNFCCC treaty**, which was ratified by all participating countries.
- It says that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions.

- CBDR-RC has served as a guiding principle as well as a source of contention in the UN climate negotiations.
- Reflecting CBDR-RC, the Convention divided countries into “**Annex I**” and “**non-Annex I**,” the former generally referring to **developed countries** and the latter to developing countries. Under the **Convention Annex I countries** have a greater mitigation role than non Annex-I countries.
- Since 1992 countries like China have gained new capabilities while maintaining relatively low per capita emissions, and tensions about the defined lines of the **Annex I and non-Annex I countries have arisen**.
- CBDR-RC and the annex classifications were codified in the 1997 Kyoto Protocol, and Annex I country emissions reductions were legally bound.
- A primary driver for the failure of the U.S. to ratify the **Kyoto Protocol** was the domestic concern that middle-income developing countries were not required to take action to address their greenhouse gas (GHG) **emissions despite their growing capability**.
- In the years following the 1992 treaty, the trajectory of emissions in populous developing countries also drew attention. **Fossil fuel-based development** by heavily populated developing countries would prevent stabilization of GHG concentrations – the agreed upon “**ultimate objective**” of the UNFCCC – because much of the global emissions budget has already been exhausted by emissions from developed countries.
- Controversy ensued over the question of responsibility for the costs entailed in switching to a sustainable **development path, particularly for large but poor countries** with very low per-capita emissions and very little access to finance.

However, in more recent **UNFCCC agreements – starting with Durban in 2011** – Parties have changed their **position to allow for countries to individually determine their** “contribution” to addressing GHG emissions. This new climate agreement is to be “**applicable to all**,” and approaches differentiation through the implementation of a bottom-up scheme to determine a global effort.

Twelver Shi'ism

Why in News ? The term was recently used Iran's president death.

- Twelver Shi'ism, also known as Imamiyya, is the largest branch of Shia Islam, encompassing roughly 85% of all Shia Muslims globally.

Core Beliefs:

Imamate: Central to Twelver Shi'ism is the concept of the Imam. They believe in twelve divinely appointed Imams, descendants of the Prophet Muhammad through his cousin and son-in-law, **Ali ibn Abi Talib**. These Imams are seen as the rightful spiritual and political leaders of the Muslim community.

Twelver Significance: The term "Twelver" refers to their belief in these twelve specific Imams.

Role of the Imams: The Imams are viewed as sinless, divinely guided individuals who possess religious and political authority. They are seen as interpreters of **Islamic law (Sharia)** and possess esoteric knowledge beyond the Quran.

The Twelve Imams:

- The Twelve Imams are revered figures in Twelver Shi'ism, with the twelfth Imam holding a special place.
- The Twelfth Imam: Muhammad al-Mahdi, the twelfth Imam, is believed to be in occultation (ghayba), a state of hiding by God's will. **Twelvers await** his return as the messiah who will usher in an era of justice.

Distribution and Significance:

Geographic Spread: Twelver Shi'ism is the dominant religion in **Iran, Iraq, Azerbaijan, and Bahrain**. It also has significant followings in Lebanon, Yemen, and parts of South Asia and Africa.

Global Influence: Twelver Shi'ism plays a major role in shaping the cultural and political landscape of these regions. It **influences art, literature, and legal systems**. The concept of the awaited Imam also carries a powerful message of hope for a more just future.

Arrest warrant against Netanyahu: ICC

Why in News ? The ICC Prosecutor has recently asked for an arrest warrant against Netanyahu:

The Prosecutor of the International Criminal Court (ICC) has requested arrest warrants against leaders of Hamas and Prime Minister Benjamin Netanyahu of Israel about the October 7, 2023 attacks and the war in Palestine.

Why arrest warrant ?

All five individuals have been charged with crimes against humanity and war crimes.

What are Crimes against humanity?

- They include murder, extermination, torture, rape, sexual offences, persecution, and other inhumane acts intentionally causing great suffering, or serious injury to the body or to mental or physical health when committed as part of a widespread .

What are war crimes?

- They include grave breaches of the Geneva Conventions in the context of armed conflict, and include wilful killing or torture of civilians or prisoners of war, extensive unlawful destruction and appropriation of property not justified by military necessity, the taking of hostages.

What are power & role of ICC ?

- The International Criminal Court (ICC) is an international tribunal established to address the most serious crimes of concern to the global community.

Power:

- **Investigate and prosecute:** The ICC has the authority to investigate and prosecute individuals accused of genocide, crimes against humanity, war crimes, and the crime of aggression.
- **Issue arrest warrants and conduct trials:** If enough evidence is found, the ICC can issue arrest warrants and hold trials for those accused.

Role:

End Impunity: The ICC's primary function is to end impunity for perpetrators of these gravest crimes. By holding them accountable, it discourages future atrocities.

Complement national courts: The ICC acts as a court of last resort. It steps in when national courts are unable or unwilling to genuinely carry out investigations and prosecutions.

Promote justice for victims: The ICC plays a crucial role in bringing justice to victims of these horrific crimes. Trials can provide a sense of closure and accountability.

Deterrence: The possibility of ICC prosecution is meant to deter potential perpetrators from committing such crimes.

Are ICC decisions binding?

- Palestine became the 123rd member of the **Rome Treaty on April 1, 2015**. In February 2021, the ICC decided that it could exercise jurisdiction over Palestine, including Gaza and the West Bank.
- **Israel is not a Party to the Rome Statute.** However, the ICC does have jurisdiction over crimes committed by nationals of **both State Parties and non-state Parties** (such as Israel) on the territory of a State Party (such as Palestine).

The ICC's decisions are binding.

- However, it relies on the cooperation of States for support, particularly for making arrests and transferring the arrested individuals to the ICC detention centre, for freezing assets, and enforcing sentences.
- However, a panel of judges at the ICC must first decide on the Prosecutor's application.

- If the necessary standard for the **arrest warrants is met** (that there are “reasonable grounds to believe” that the person named has “**committed a crime within the jurisdiction of the Court**”), warrants will be issued.
- **All 124 State Parties would be under obligation to cooperate** with the court, and to arrest and extradite these individuals to The Hague.
- This would make international travel difficult for **Netanyahu and Gallant in the future**, including visits to Israel’s allies such as Germany and the **United Kingdom, which are Parties to the Rome Statute.**

Important points to note:

- The ICC can't prosecute nationals of non-member countries unless the **UN Security Council refers the situation to them.**
- The ICC has faced criticism for its focus on African nations in its investigations.
- Some powerful countries, including the **US, China, and Russia, are not members of the ICC.**

What is Copernicus Emergency Management Service (CEMS)?

Why in News ? On the request of Iran, the European Union (EU) has activated its rapid satellite mapping service to help search efforts in finding the crashed chopper of Iranian president.

The rapid mapping service is **one of the crucial components of the Emergency Management Service (EMS)**, which comes under the EU’s Copernicus programme.

How does the rapid mapping work?

- To provide maps quickly, the service acquires, processes, and analyses satellite imagery, geospatial data, and social media when required. According to the Copernicus website, the RM service can supply four different “products” — each one of them provides maps and brief analysis — which the user can choose while requesting the service.

What is the Europe Union’s Copernicus programme?

- It was launched in 1998, the Copernicus programme was earlier called **Global Monitoring for Environmental Security (GMES).**
- Currently, it is implemented by the European Commission (EC) with support from the ESA and the **European Environment Agency (EEA).**
- The Copernicus programme is part of the EU’s space programme and aims to monitor the Earth and its environment by collecting data from a set of satellites known as the Sentinels.
- It also gets data from contributing missions (existing commercial and public satellites) and in situ or non-space sources such as ground stations.
- The data are processed and analysed to generate value-added information, which can be used for a wide range of applications in many areas.

- These include land management, the marine environment, the atmosphere, emergency response, security, and climate change, according to the website of the European Space Agency (ESA). Users get the information on a “full, open, and free-of-charge” basis.

Antarctic Parliament meets in Kochi: ATCM 46

Why in news? India is hosting the **46th Antarctic Treaty Consultative Meeting (ATCM 46)**, also known as the Antarctic Parliament, from May 20-30 in Kochi.

The National Centre for Polar and Ocean Research, Goa, through the Ministry of Earth Sciences (MoES), has organised the meeting, which will be attended by the 56 member countries of the Antarctic Treaty.

About The Antarctic Treaty

- **Twelve countries** — Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the USSR, the United Kingdom, and the United States were the original signatories to the Antarctic Treaty, which was signed on December 1, 1959.
- The treaty came into force in 1961, and a total of 56 countries including India, in 1983 have joined it since then.
- The Antarctic Treaty, which was signed during the Cold War, effectively designated Antarctica as a “no man’s land”, outside the bounds of international geopolitical competition.

Key features of the treaty:

- Antarctica shall be used **only for peaceful purposes, and no militarisation** or fortification shall be allowed.
- All signatories will have the freedom to **carry out scientific investigations, and should share plans for scientific programmes, extend required cooperation**, and freely make available the data gathered.
- **Nuclear testing or disposal of radioactive waste materials shall be prohibited** anywhere in Antarctica.

Criteria for Statehood under International Law : Montevideo Convention

Why in News ? Norway, Ireland and Spain have recently said that they would recognise a Palestinian state.

What are the criteria?

- The most widely accepted criteria for statehood under international law come from the **Montevideo Convention** on the Rights and Duties of States, adopted in 1933. While not a formal treaty, it has become a cornerstone of customary international law.

What is Montevideo Convention?

- The Montevideo Convention on the Rights and Duties of States is a treaty signed at **Montevideo, Uruguay, on December 26, 1933**, during the Seventh International Conference of American States. The Convention codifies the declarative theory of statehood as accepted as part of customary international law.

The Convention outlines four main criteria:

1. **Permanent Population:** There must be a group of people living together in the territory. This doesn't require a specific size, but the population should be settled and not nomadic.
2. **Defined Territory:** The state needs a clearly defined geographical area. While exact borders may be disputed, there should be a general understanding of the claimed territory.
3. **Government:** An effective government that can maintain order and administer the territory is essential. This government should be able to carry out its functions throughout the claimed territory.
4. **Capacity to Enter into Relations with Other States:** The entity must be able to establish diplomatic relations and participate in international agreements. This demonstrates its independence and ability to fulfill international obligations.

It's important to note that recognition by **other states is not a requirement for statehood according to the Montevideo Convention**. However, recognition can be a political tool used by states to acknowledge a new state and establish diplomatic relations.

There are some additional considerations beyond the Montevideo Convention:

Independence: The state should not be under the control of another state.

Self-Determination: The people of the territory should have the right to decide their own political future.

Why Palestine has not been recognized as a state by some countries?

Israeli-Palestinian Conflict: The ongoing conflict between Israel and Palestine is a major hurdle. Israel's security concerns and the status of Jerusalem are key sticking points.

Oslo Accords: These interim agreements haven't led to a final peace treaty. Some argue recognizing Palestine undermines the negotiation process outlined in the Accords.

Internal Palestinian Divisions: The division between **Hamas, which controls Gaza**, and the Palestinian Authority, which governs parts of the West Bank, weakens the claim to a unified state.

International Law Interpretations: There are differing views on whether Palestine **meets all the criteria of statehood under international law**, particularly regarding control over territory.

Arguments for Recognition: Supporters believe Palestinians have the right to self-determination and recognition would strengthen their bargaining position for peace.

Arguments against Recognition: Some argue recognizing a Palestinian state before a peace deal rewards actions like Hamas attacks and weakens Israel's security.

About the Oslo Accords:

They were a pair of interim agreements signed between **Israel and the Palestine Liberation Organization (PLO)** in the early **1990s**. They were a major attempt to move towards a peace treaty and resolve the Israeli-Palestinian conflict.

Two Agreements: There were two main accords:

Oslo I Accord (1993): Established a framework for Palestinian self-rule in the **Gaza Strip and West Bank**.

Oslo II Accord (1995): Further defined the details of self-rule and addressed security arrangements.

Goals: The aim was to create a five-year interim period of Palestinian self-governance leading to permanent status negotiations **on core issues like borders, Jerusalem, refugees, and settlements**.

Key Points:

Mutual Recognition: Israel recognized the PLO as the representative of the Palestinians and the PLO renounced violence and recognized Israel's right to exist.

Palestinian Authority: Established the Palestinian Authority (PA) to govern parts of the **West Bank and Gaza Strip**.

Security Arrangements: Defined security cooperation between Israel and the PA.

The Oslo Accords have had a mixed legacy:

Positives: They brought a period of relative calm and offered a framework for peace.

Negatives: A final peace treaty was never reached. Violence continued, and the status of **Jerusalem, refugees, and settlements** remain unresolved.

Rangelands: Pastoralists

Why in News ? According to the United Nations Convention on Combating Desertification (UNCCD) , about half of the world's rangelands are degraded and need policy interventions, and communities depending on them need focused support.

Key points of the report:

- Nearly **50% of the world's rangelands** can be considered “**degraded**” and are facing a “**silent demise**”.
- Climate change, unsustainable land and livestock management practices, biodiversity loss, and the conversion of rangelands to farmlands are some of the primary factors of rangeland degradation.
- Uncertainty over land rights among pastoralist communities, who depend on rangelands for their livelihood, **also leads to their degradation**.
- It is severely affecting the communities dependency on rangelands as their deterioration impacts **soil fertility and biodiversity**, leading to a **dip in incomes and rise in conflicts** with authorities over grazing rights.

What are rangelands?

- The UNCCD report defines rangelands as natural or **semi-natural ecosystems** that are grazed by livestock or wild animals.
- Rangelands contain vegetation such as grasses, shrubs, open forests, and agroforestry systems (land which contains trees and crops or pastures).
- The exact nature of rangelands' vegetation is influenced by **rainfall, temperature**, and other climate phenomena.
- Currently, rangelands cover **80 million sq km** of Earth's **terrestrial surface** area (over half of Earth's land).
- Rangelands generate **16% of global food production** and **70%** of feed for domesticated herbivores, most significantly in **Africa and South America**.
- In India, rangelands occupy about **1.21 million sq km**, from the **Thar Desert** to Himalayan meadows, as per the UNCCD report.

Who are pastoralists?

- Pastoralism is a livelihood system based on **livestock production**. This includes livestock rearing, dairy production, meat production, wool production and leather production.
- The communities and groups, both **indigenous and non-indigenous**, who are involved in livestock production are known as **pastoralists**. These communities **rear sheep, goats, cattle, horses, donkeys, camels, yaks, llamas, alpacas, and pigs**.
- Globally, an **estimated 500 million pastoralists** are involved in livestock production and allied occupations.
- In India, pastoralists population are around **13 million people**.
- India is home to **20% of the world's livestock population**. Around 77% of these animals are reared in pastoralist systems.

About UNCCD:

- The United Nations Convention to Combat Desertification (UNCCD) is an **international agreement specifically designed to address land degradation and drought issues**.
- It was **established in 1994**.
- The UNCCD is the **only legally binding international framework focusing** on combating desertification and mitigating the effects of drought.
- **India is a party** to the United Nations Convention to Combat Desertification (UNCCD).
- India actually became a signatory to the UNCCD on October 14, 1994 and **ratified it in October 1996**.
- The Ministry of Environment, Forest and Climate Change (**MoEFCC**) is the government body responsible for overseeing implementation of the UNCCD in India.

Treaty on WIPO

Why in News ? The Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge was adopted at the Diplomatic Conference held under the aegis of the World Intellectual Property Organization (WIPO) at its headquarters in Geneva, between May 13 and May 24, 2024. This is the 27th treaty under WIPO and the first in the last 10 years.

Key points of the treaty:

- It is the first treaty that deals with genetic resources and traditional knowledge held by Indigenous Peoples as well as local communities.
- The treaty would ensure that whenever there is a claimed invention on genetic resources, the applicants will have to disclose the country of **origin or source of the genetic resources**.
- The applicant would also have to disclose the **Indigenous Peoples or local community** who provided the traditional knowledge, in case the patent is based on traditional knowledge.

How it is important for India?

- The treaty is important to India as the country holds 7-8 per cent of global biodiversity and a rich repertoire of knowledge based on these genetic resources.
- Under current laws, while genetic resources themselves cannot be patented, inventions developed using them can be protected.

What are concerns still not resolved?

- The final text still does not address the problem of the biopiracy of genetic resources and associated traditional knowledge using patents, even though concern has been raised through the years.

About the World Intellectual Property Organization (WIPO) :

- It is a global forum for intellectual property (IP) focused on promoting and protecting creativity and innovation around the world.
- A self-funded agency of the **United Nations with 193 member states**.
- Established in 1967 by the Convention Establishing the World Intellectual Property Organization.
- **Headquartered in Geneva, Switzerland.**

Cyclones Hidaya & Laly

Why in News ? Barely two weeks after Cyclone Hidaya struck the East African coastline, Cyclone Laly has recently wreaked havoc in the region killing two people in Kenya and impacting dozens in Somalia.

- Cyclone Laly, which intensified from a tropical storm, unleashed strong winds, heavy rain and high waves across the West Indian Ocean region.
- In Somalia, the cyclone made landfall in the southwestern and southern regions, including the capital, Mogadishu.
- Tropical Storm Laly intensified into a tropical cyclone, marking a historic event in the southwest Indian Ocean basin. Positioned just 250 kilometres from Pemba Island and less than 300 km from Mombasa, it's a rare occurrence within this latitude range.



About Pemba Island :

- It is a beautiful island located in the **Zanzibar Archipelago**, off the coast of East Africa, belonging to **Tanzania**.
- Pemba is known for its lush, green hills, clove plantations, and beautiful beaches. The Pemba Channel, with its coral reefs and abundant marine life, separates the island from mainland Tanzania.
- The population of Pemba Island is about 400,000 people.
- The majority of the population is **Swahili**, with a significant minority of Arabs and Indians. The main religion on the island is Islam.

Arab League: Manama Declaration

Why in News ? The Arab League has recently called for the deployment of UN peacekeeping forces in the Palestinian territories during a summit in **Manama, Bahrain**.

About the Arab League :

- Arab League, also called League of Arab States (LAS) is a regional organization of Arab states in the Middle East and parts of Africa.
- It was formed in Cairo on 22 March 1945. The founding member states were Egypt, Syria, Lebanon, Iraq, Jordan, Saudi Arabia, and Yemen.
- **Headquarters:** Cairo, Egypt.



- Objective is to strengthen ties among member states, coordinate their policies and direct them towards a common good.
- Currently it has 22 members including Palestine, which the League regards as an independent state.
- Syria's participation has been suspended since November 2011, as a consequence of government repression during the Syrian Civil War.

- The highest body of the league is the Council, composed of representatives of member states, usually foreign ministers, their representatives or permanent delegates.

About Manama Declaration:

- The Manama Declaration emerged from the 33rd Arab League Summit held in the Bahraini capital, Manama.
- The **22-member Arab League** issued the “**Manama Declaration**” calling for:
- The deployment of United Nations peacekeeping forces in the occupied Palestinian territories.
- The protection to continue until a two-state solution is implemented.
- The declaration urged all Palestinian factions to unite under the umbrella of the **Palestine Liberation Organization (PLO)**.

Treasury Savings Account (TSA) and Single Nodal Agency (SNA) bank accounts

Why in News ? The Finance Minister Nirmala Sitharaman has recently said that the government has so far achieved savings of more than 25,500 crore through the **treasury savings account (TSA) and the single nodal agency (SNA) bank accounts**.

What is Treasury Savings Account (TSA)?

- A **Treasury Savings Account (TSA)** is a bank account used by the government to manage funds allocated to autonomous bodies. Introduced in the financial year 2018 (FY18), it works under the principle of "just-in-time" release of funds.

Function:

- Previously, funds allocated to autonomous bodies might remain parked in unused accounts for extended periods.
- TSAs centralize these funds and disburse them only when required. This prevents the unnecessary accumulation of unutilized funds.

Benefits:

Saves Money: The Indian government has reportedly saved over Rs. 25,500 crore through TSAs by eliminating idle funds.

Improves Efficiency: TSAs promote better financial management by ensuring funds are readily available when needed.

Overall Impact:

- TSAs contribute to fiscal prudence and transparency in government spending. They also help streamline the allocation and utilization of funds for autonomous bodies.

What is Single Nodal Agency (SNA) ?

- It is a major reform initiated in **2021** with regards to the manner in which **funds for Centrally Sponsored Schemes (CSS) are released, disbursed and monitored**.
- This revised procedure, now referred to as the SNA model, **requires each State to identify**

NASA's PREFIRE Mission

Why in News ? : Rocket Lab's Electron rocket recently lifted off from Launch Complex 1 at Māhia, New Zealand carrying a small satellite for NASA's PREFIRE (Polar Radiant Energy in the Far InfraRed Experiment) mission.

About the Pre Fire Mission :

- NASA's Pre-Fire Mission, also referred to as the Polar Radiant Energy in the Far InfraRed Experiment, is a recently launched mission designed to study Earth's poles.
- It utilizes two CubeSats, which are tiny satellites about the size of a shoebox, to measure the amount of heat radiating from Earth into space, particularly focusing on the Arctic and Antarctic regions.

Significance of the Mission:

- Understanding these measurements is crucial for improving climate models and making predictions about how a warming planet will affect sea ice loss, ice sheet melt, and sea level rise.
- This mission is significant because nearly 60% of the Arctic's heat emission occurs at wavelengths that have never been systematically measured before.
- The data collected by PREFIRE will fill this gap in our knowledge and improve the accuracy of climate models.
- The two CubeSats were launched in May 2024 and are designed for a mission lasting around 10 months.
- They are in near-polar orbits at an altitude of 470 to 650 kilometers. Each CubeSat carries a miniaturized infrared spectrometer that can measure infrared wavelengths between 0 and 45 micrometers.

PRAVAAH Portal

Why in News ? The RBI has launched three major initiatives, including a mobile app, to enable retail investors to participate in the government securities (G-Secs) market.

These 3 initiatives are PRAVAAH portal , Fintech & EmTech Repositories.

About PRAVAAH portal :

- The Reserve Bank of India (RBI) launched the PRAVAAH portal in April 2023.
- It stands for Platform for Regulatory Application, validation and Authorisation.

Purpose: It's a secure web-based platform designed to streamline the process of applying for various regulatory approvals from the RBI.

Benefits:

- Centralized Platform: Individuals and entities can submit applications for licenses, authorizations, or other regulatory approvals in one place. This eliminates the need to navigate through different channels or departments within the RBI.

- **Efficiency:** The online application process is expected to expedite approvals and clearances by the RBI.

About The FinTech & EmTech Repositories :

- The **FinTech Repository** aims to capture essential information about FinTech entities, their activities, technology uses, etc. FinTechs, both regulated and unregulated, are encouraged to contribute to the repository.
- Simultaneously, a related repository for only RBI regulated entities (banks and NBFCs) on their adoption of emerging technologies (like AI, ML, Cloud Computing, DLT, Quantum, etc.), called **EmTech Repository**, is also being launched.
- The **FinTech and EmTech Repositories are secure web-based applications** and are managed by the Reserve Bank Innovation Hub (RBIH), a wholly owned subsidiary of RBI.
- The repository would enable availability of aggregate sectoral level data, trends, analytics, etc., that would be useful for both policymakers and participating industry members.
- RBI encourages the FinTechs and Regulated Entities to actively contribute to the repositories.

What is Chip 4" or "Fab 4?

The "Chip 4" or "Fab 4" alliance is a group of countries aiming to cooperate on semiconductor (chip) production and supply chains.

Members:

- The alliance consists of the United States, Japan, South Korea, and Taiwan.
- These countries are powerhouses in the semiconductor industry:
- The US has major chip design companies like Intel, AMD, and Nvidia.
- Japan is a leader in chipmaking materials and equipment.
- South Korea boasts memory chip giants like Samsung and SK Hynix.
- Taiwan is home to the world's largest contract chip manufacturer, TSMC.

Goals:

- The primary objective is to strengthen the global semiconductor supply chain and reduce reliance on any single country (often seen as an allusion to China).
- This includes:

Boosting domestic chip production: The alliance aims to encourage member countries to invest in building more chip fabrication plants (fabs) within their borders.

Collaboration on research and development (R&D): Working together to develop next-generation chip technologies.

Securing critical materials and equipment: Ensuring a stable supply of raw materials and equipment needed for chip production.

Protecting intellectual property (IP): Safeguarding the intellectual property rights of member countries' chip companies.

Benefits:

- **Enhanced Security:** A more diversified chip supply chain could lessen the risk of disruptions caused by geopolitical tensions or natural disasters.

- **Technological Advancement:** Collaboration on R&D could accelerate innovation in the semiconductor industry.
- **Economic Growth:** Increased domestic chip production can create jobs and boost the economies of member countries.

Challenges:

- **Geopolitical Tensions:** Navigating complex geopolitical relationships between member countries, particularly regarding China.
- **Balancing Competition and Collaboration:** Member countries are also competitors in the chip market, so striking a balance between cooperation and competition is crucial.
- **Implementation:** Translating goals into concrete actions and ensuring all members are committed to the alliance's objectives.

Current Status:

- The alliance is still in its early stages. The first official meeting of senior officials was held in September 2022.
- The success of the Chip 4 alliance will depend on the member countries' ability to overcome these challenges and effectively implement their collaborative efforts.

Overall, the Chip 4 alliance represents a significant development in the global semiconductor industry. Whether it can achieve its goals of a more secure and resilient supply chain remains to be seen.

About Shrinkflation

Why in News ? South Korean government has ordered the companies that if they are doing Shrinkflation then they have to mention it clearly on product label for 3 months. Otherwise, Government will impose penalty.

Shrinkflation is a sneaky way for manufacturers to raise prices without explicitly increasing the price tag.

How it works?

The Scam: Manufacturers reduce the quantity of a product while keeping the price the same (or maybe even raising it slightly). This means you get less for your money.

Sneaky Strategy: The hope is that you won't notice the smaller size, especially if the packaging remains similar. This makes it difficult to compare prices accurately between different purchases.

Examples of Shrinkflation:

Fewer chips in the bag: You might notice your favorite potato chip bag seems somehow lighter. Maybe there's more air inside, or the bag itself has shrunk a bit. This means you're getting fewer chips for the same price.

Shorter toilet paper rolls: The toilet paper roll might look the same size, but it's actually shorter, offering fewer sheets. This translates to needing to buy replacements more often.

Smaller cereal boxes: The familiar cereal box might have gotten a little slimmer, containing less cereal but still costing the same amount.

Impacts of Shrinkflation:

Reduced Value: You're essentially paying more per unit of the product (by weight or volume) because you're getting less.

Hidden Costs: Shrinkflation can strain your grocery budget as you need to buy more of the same product to get the same amount you used to.

Challenges for Consumers: It requires more vigilance to compare prices effectively and avoid getting tricked by the seemingly unchanged price tags.

How to Spot Shrinkflation:

- **Check the Unit Price:** Pay attention to the price per unit (ounce, gram, etc.) listed on the shelf tag, not just the overall price. This allows for a more accurate price comparison between different brands or package sizes.
- **Compare Package Sizes:** Notice any changes in the size or weight of the product over time.
- **Be Mindful of "Value Packs":** Sometimes larger packages might seem like a better deal, but do the math per unit price to ensure you're actually getting more for your money.
- By staying informed about shrinkflation tactics, you can be a more conscious shopper and make informed choices when it comes to your groceries and other consumer products.

Phi-3-mini L: Microsoft's Smallest AI model :What are Large Language Model (LLM) and SLM)?

Why in News? What is Phi-3-mini?

Phi-3-Mini is believed to be first among the three small models that Microsoft is planning to release. It has reportedly outperformed models of the same size and the next size up across a variety of benchmarks, in areas like language, reasoning, coding, and maths.

What are LLM & SLM?

- Essentially, language models are the backbone of AI applications like ChatGPT, Claude, Gemini, etc. These models are trained on existing data to solve common language problems such as text classification, answering questions, text generation, document summarization, etc.

A **large language model (LLM)** is a type of artificial intelligence (AI) program that can recognize and generate text, among other tasks. LLMs are trained on huge sets of data — hence the name "large." **LLMs are built on machine learning**: specifically, a type of neural network called a transformer model.

- In simpler terms, an **LLM is a computer program** that has been fed enough examples to be able to recognize and interpret human language or other types of complex data. Many LLMs are trained on data that has been gathered from the Internet — thousands or millions of gigabytes' worth of text. But the quality of the samples impacts how well LLMs will learn natural language, so an LLM's programmers may use a more curated data set.

What are small language models?

- Small language models are all about challenging the notion that bigger is always better in natural language processing.
- Unlike the hundreds of billions of parameters (variables that a model learns during training) models like **GPT-4** or **Gemini Advanced** boast, **SLMs** range from 'only' a few million to a few billion parameters.

What is the Turing Test? About Loebner Prize

The Turing Test is a method of inquiry in artificial intelligence (AI) for determining whether or not a computer is capable of thinking like a human being. The test is named after Alan Turing, the founder of the Turing Test and an English computer scientist, cryptanalyst, mathematician and theoretical biologist.

During the test, one of the humans functions as the questioner, while the second human and the computer function as respondents. The questioner interrogates the respondents within a specific subject area, using a specified format and context. After a preset length of time or

number of questions, the questioner is then asked to decide which respondent was human and which was a computer.

The test is repeated many times. If the questioner makes the correct determination in half of the test runs or less, the computer is considered to have artificial intelligence because the questioner regards it as "just as human" as the human respondent.

Variations and alternatives to the Turing Test

There have been a number of variations to the Turing Test to make it more relevant. Such examples include:

- **Reverse Turing Test** -- where a human tries to convince a computer that it is not a computer. An example of this is a CAPTCHA.
- **Total Turing Test** -- where the questioner can also test perceptual abilities as well as the ability to manipulate objects.
- **Minimum Intelligent Signal Test** -- where only true/false and yes/no questions are given.

Alternatives to Turing Tests were later developed because many see the Turing test to be flawed. These alternatives include tests such as:

- **The Marcus Test** -- in which a program that can 'watch' a television show is tested by being asked meaningful questions about the show's content.
- **The Lovelace Test 2.0** -- which is a test made to detect AI through examining its ability to create art.

Loebner Prize has been awarded annually since 1990 to the most human-like computer program as voted by a panel of judges.

The competition follows the standard rules of the Turing Test. Critics of the award's relevance often downplay it as more about publicity than truly testing if machines can think.

About Loebner Prize:

- The Loebner Prize was an annual competition in artificial intelligence that awarded prizes to the computer programs considered by the judges to be the most human-like.
- The format of the competition was that of a standard Turing test.

Batillipes Chandrayaani

Why in News? Researchers from the Department of Marine Biology, Cochin University of Science and Technology (CUSAT) have recently discovered a new species of **marine tardigrade, colloquially known as water bears** -- a phylum of eight-legged segmented micro-animals.

- This microscopic creature has been named as Batillipes chandrayaani, a homage to the Chandrayaan-3, the first-ever successful lunar south pole landing mission hosted by the Indian Space Research Organisation (ISRO) in 2023.

About Batillipes Chandrayaani:

- Batillipes Chandrayaani is a new species of marine tardigrade discovered off the southeast coast of **Tamil Nadu, India**.

- It was named after the **Chandrayaan-3 moon mission**, a testament to India's advancements in both space exploration and marine biology.

About Tardigrades?

- It is also known **colloquially as water bears** or moss piglets, are a phylum of eight-legged segmented micro-animals.
- They were first described by the **German zoologist Johann August Ephraim Goeze in 1773**, who called them **Kleiner Wasserbär**.



Kerala temples bans oleander flowers

Why in News The two Kerala government-run temple boards have recently banned the use of oleander flowers in food offered to the deity (naivedhya) and to the devotees (prasadam). The decision was taken after a young woman died of accidental poisoning from oleander leaves.

What is oleander?

- **Nerium oleander**, commonly known as oleander or rosebay, is a plant cultivated worldwide in tropical, subtropical, and temperate regions. Known for its drought tolerance, the shrub is often used for ornamental and landscaping purposes.
- In Kerala, the plant is known by the names of arali and kanaveeram, and is grown along highways and beaches as a natural, green fencing. There are different varieties of oleander, each with a flower of a different colour.
- It is also locally known as '**arali**'.

How is oleander used in traditional medicine?

- The Ayurvedic Pharmacopoeia of India (API), a government document that describes the quality, purity, and strength of **drugs used in Ayurveda**, mentions **oleander**. According to API, an oil prepared from the root bark can be used to treat skin diseases.
- The plant has been "frequently described in Brihatrayi, Nighantus and other classical Ayurvedic texts. Charka [**Charak Samhita**] has prescribed the leaves of white

flowered variety externally in chronic and obstinate skin diseases of serious nature including leprosy.

First human recipient of pig kidney transplant dies: What is xenotransplantation?

Why in News Recently, The first recipient of a modified pig kidney transplant passed away, around two months after the surgery was carried out.

The doctors say that we have no indication that it (Richard “Rick” Slayman's death) was the result of his recent transplant.

What is xenotransplantation?

- According to the US Food and Drug Administration (FDA), “Xenotransplantation is any procedure that involves the transplantation, implantation or **infusion into a human recipient** of either (a) live cells, tissues, or organs from a **nonhuman animal source**, or (b) human body **fluids, cells, tissues or organs** that have had ex vivo contact with live nonhuman animal cells, tissues or organs.”
- Essentially, it is the use of animal cells and organs to heal humans. Xenotransplantation involving the **heart was first tried in humans in the 1980s**. The need for such a procedure was felt because of the significant gap between the number of transplantations needed by patients and the availability of donor organs.

How does xenotransplantation happen?

- The animal organ selected has to undergo genetic modifications, so that the human body does not reject it.
- A report from the Harvard Medical School, whose physicians were involved in Slayman's operation, said **69 genomic edits** were made to the pig kidney in his case.
- The gene **editing technology CRISPR-Cas9** was employed to “Remove certain pig genes that produce sugars with antibodies our immune systems react to” and “Add certain human genes to improve the kidney's compatibility with humans.”

Why are pigs often used for xenotransplantation?

- Pig heart valves have been used for replacing damaged valves in humans for over 50 years now. The pig's anatomical and physiological parameters are similar to that of humans, and the breeding of pigs in farms is widespread and cost-effective.
- Also, many varieties of pig breeds are farmed, which provides an opportunity for the size of the harvested organs to be matched with the specific needs of the human recipient.

Virtual Touch

Why in News ? The Delhi High Court has recently denied bail to an accused for alleged abetment of drugging, kidnapping, and sexually exploiting a minor.

The judgment recommends that “minors must be equipped with the knowledge and tools to navigate online interactions safely and **recognize** potential risks lurking in cyberspace”. It introduces the concept of “**virtual touch**”, drawing parallels between digital interactions and physical contact. It also suggests that this idea be introduced to young minds as part of the “**good touch/bad touch**” exercise, a common intervention that teaches children to discern between appropriate and inappropriate contact.

Virtual touch can refer to two different but related concepts:

Technology that creates a sense of touch in the digital world: This can involve using haptic technology to simulate touch sensations like vibrations, pressure, or textures.

It's often used in:

Virtual Reality (VR): VR headsets might incorporate haptic gloves or suits that allow users to feel objects and interact with the virtual environment in a more realistic way.

Gaming Controllers: Advanced game controllers might have haptic feedback features that provide in-game sensations like the recoil of a gun or the feeling of driving on different terrains.

Medical Applications: Haptic technology can be used in surgical simulators to provide trainees with a more realistic feel for manipulating instruments. The concept of touch in a virtual environment: Even without advanced haptics, we can experience a sense of virtual touch through:

Interaction with virtual objects: Touching buttons or manipulating objects on a touchscreen can feel intuitive and engaging, even though there's no physical contact.

Social VR experiences: Some VR platforms allow avatars to perform virtual handshakes, hugs, or high-fives, creating a sense of social connection despite physical distance. The concept of virtual touch is still evolving, but it has the potential to revolutionize how we interact with technology and experience the digital world.

Dengue Vaccine Qdenga

Japan's Takeda Pharmaceutical will scale up production of its dengue vaccine Qdenga through a partnership with Indian vaccines maker Biological E.

- These doses will be available for governments in endemic countries by 2030 as part of their national immunization programmes.
- Biological E. will ramp up to a manufacturing capacity of 50 million doses a year, accelerating Takeda's efforts to produce 100 million doses per year within a decade.
- Takeda's vaccine is available for children and adults in countries like Indonesia, Thailand, Argentina and Brazil.
- Brazil has bought 5.2 million doses of Qdenga, with an additional 1.32 million doses provided at no cost, as the country undertakes emergency measures and mass vaccination against the mosquito-borne disease.

- Since the beginning of 2023, the world has been facing an upsurge of dengue cases and deaths reported with further spread to areas previously free of dengue, according to the World Health Organization.

- **Qdenga is a vaccine that helps protect against dengue fever, a mosquito-borne illness** caused by four different serotypes of the dengue virus.
- **Function:** Qdenga is a **tetravalent vaccine**, meaning it **protects against all four serotypes (strains) of the dengue virus**. The vaccine contains weakened versions of these viruses, which can't cause the disease itself but instead trigger your body's immune system to develop defenses against future exposure to the dengue virus.
- **Age range:** Qdenga is approved for use in individuals four years of age and older.
- **Dosage:** The vaccine is administered as a two-dose series with a three-month gap between doses.

High Energy Photon Source (HELPS): What is synchrotron?

Why in news ?

The chinese' High Energy Photon Source (HELPS) will begin operations by the end of this year. It will be the first fourth-generation synchrotron light source in Asia.

What is synchrotron ?

It is a powerful machine used in scientific research.

Particle Accelerator: It's a type of particle accelerator, specifically designed for charged particles, most commonly electrons.

Acceleration Process: The synchrotron accelerates these electrons to very high speeds, close to the speed of light.

Circular Path: The electrons travel in a fixed circular path inside a large ring-shaped chamber.

Magnetic Field: Strong magnets within the chamber bend the path of the electrons, keeping them on their circular trajectory. As the electrons accelerate, the magnetic field strength also increases to maintain a constant orbit.

Key Feature: Synchrotron Light:

Emission: The most important feature of a synchrotron is the emission of intense light, called synchrotron light. This light is produced when the high-speed electrons are forced to change direction by the magnetic field.

Properties: Synchrotron light is exceptional because it:

Very Bright: It's millions of times brighter than conventional X-ray sources.

Wide Range: It covers a broad spectrum of electromagnetic radiation, from infrared to X-rays.

Tunable: The specific wavelength of the light can be adjusted for different experiments.

Highly Polarized: The light waves can vibrate in a specific direction, which is valuable for certain research.

The High Energy Photon Source (HEPS), also referred to as **Gao Neng Tong Bu She Ra Guang Yuan** in Chinese, is a major scientific project currently under construction in China.

About HELPS:

Type: It's a diffraction-limited storage ring synchrotron light source. This means it uses a specific type of particle accelerator to generate extremely bright X-rays for scientific research.

Location: It's being built in the Huairou District, a suburban area of Beijing, China.

Status: Construction is underway, with an estimated completion date around 2025.

Significance: Upon completion, HEPS is expected to be one of the brightest synchrotron radiation sources in the world, particularly for hard X-rays.

Benefits and Applications:

Advanced Research: The intense X-rays from HEPS will enable researchers to study materials, molecules, and biological systems at an unprecedented level. This will lead to advancements in various fields, including:

Physics: Probing the fundamental properties of matter and energy.

Chemistry: Understanding the structure and behavior of complex molecules.

Materials Science: Developing new materials with desired properties for applications like electronics, energy storage, and medicine.

Biology and Medicine: Understanding the structure and function of proteins, drugs, and biological materials, with potential applications in drug discovery and medical diagnostics.

Thrombotic Thrombocytopenic Purpura (TTP)

What is TTP?

- TTP is a rare, life-threatening blood disorder. In TTP, blood clots form in small blood vessels throughout your body. The clots can limit or block the flow of blood to your organs, such as your brain, kidneys, and heart. This can prevent your organs from working properly and can damage your organs.
- The increased clotting that occurs in TTP also uses up your platelets. Platelets are tiny blood cells that help form blood clots.
- These cell fragments stick together to seal small cuts and breaks in your blood vessels to stop bleeding. When your platelets are used up, you do not have enough platelets to form blood clots when necessary. This may cause bleeding and bruising.
- “**Thrombotic**” refers to the blood clots that form.
- “**Thrombocytopenic**” means the blood has a lower-than-normal platelet count.
- “**Purpura**” refers to purple bruises caused by bleeding under your skin.
- TTP usually occurs suddenly and lasts for days or weeks, but it can continue for months. TTP can also cause red blood cells to break apart faster than your body can replace them. This leads to a rare form of anemia called hemolytic anemia.
- TTP can be fatal. Without treatment, it can cause long-term problems, such as brain damage or a stroke.

What are the symptoms?

- The symptoms of TTP may happen suddenly. Most people who have inherited TTP begin to have symptoms soon after birth. However, some do not have symptoms until they are adults.
- The symptoms of TTP are caused by blood clots, a low platelet count, and damaged red blood cells. Your symptoms may include:
- Petechiae, which are small, flat red spots under the skin caused by blood leaking from blood vessels
- Purpura, which is bleeding in your skin that can cause red, purple, or brownish-yellow spots
- Paleness or jaundice (a yellowish color of the skin or whites of the eyes)
- Extreme tiredness
- A fever
- A fast heart rate or shortness of breath
- Headache, speech changes, confusion, coma, stroke, or seizure
- A low amount of urine, or protein or blood in your urine
- Feeling sick to your stomach (nausea), vomiting, and diarrhea

Antarctic Parliament meets in Kochi: ATCM 46

Why in news? India is hosting the **46th Antarctic Treaty Consultative Meeting (ATCM 46)**, also known as the Antarctic Parliament, from May 20-30 in Kochi.

The National Centre for Polar and Ocean Research, Goa, through the Ministry of Earth Sciences (MoES), has organised the meeting, which will be attended by the 56 member countries of the Antarctic Treaty.

About The Antarctic Treaty

- **Twelve countries** — Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the USSR, the United Kingdom, and the United States were the original signatories to the Antarctic Treaty, which was signed on December 1, 1959.
- The treaty came into force in 1961, and a total of 56 countries including India, in 1983 have joined it since then.
- The Antarctic Treaty, which was signed during the Cold War, effectively designated Antarctica as a “no man’s land”, outside the bounds of international geopolitical competition.

Key features of the treaty:

- Antarctica shall be used **only for peaceful purposes, and no militarisation** or fortification shall be allowed.
- All signatories will have the freedom to **carry out scientific investigations, and should share plans for scientific programmes, extend required cooperation**, and freely make available the data gathered.

- **Nuclear testing or disposal of radioactive waste materials shall be prohibited anywhere in Antarctica.**

Shaw Prize

Why in news?

- Indian-origin astronomer **Professor Srinivas R Kulkarni** will be honored with the **prestigious Shaw Prize by America.**
- Professor **Kulkarni** has discovered **millisecond pulsars, gamma ray bursts, supernovae and other celestial bodies.** He will be awarded the Shaw Prize in Astronomy for these unprecedented discoveries. **Srinivas R Kulkarni is Professor in the Department of Physics, Mathematics and Astronomy at the California Institute of Technology.**

These scientists will receive Shaw Award:

- Apart from Professor Kulkarni, American scientists **Swee Le Thein** and **Stuart Orkin** will be awarded the Shaw Prize in the fields of biology and medicine and scientist **Peter Sarnak** in mathematical sciences.

Unprecedented discovery by Professor Kulkarni:

- The Shaw Prize Foundation said, 'Professor Kulkarni has made brilliant discoveries in astronomy. His understanding of the sky has brought a new revolution in the field of astronomy. The **Palomar Transient Factory** was conceptualized and built under the leadership of Professor Kulkarni and his successor **Zwicky.**
- The Palomar Transient Factory was an astronomical survey.
- Professor **Kulkarni** did his MS from the **Indian Institute of Technology (IIT)** in **1978.** After this he did his PhD from the University of California in 1983. Professor Kulkarni was also the Director of Caltech Law School from 2006 to 2018.

Shaw Prize:

- **Shaw Prize is given every year by the Shaw Prize Foundation in three categories – Astronomy, Biology and Medical Sciences and Mathematical Sciences.** The winner in each category is given a **prize money of US \$ 1.2 million.** This will be the 21st year the Shaw Award will be presented. The winners will be honored at a ceremony to be held in Hong Kong on November 12.

Operation Indravati

Why in News ? India has recently launched '**Operation Indravati**' to evacuate its nationals from Haiti-where streets have been taken over by criminal gangs- to Dominican Republic.

- More than 60 Indian have been evacuated so far.
- Hundreds of thousands have been displaced within Haiti and thousands killed amid widespread reports of rape, arson and ransom kidnappings, while food prices soar and hospitals run short of key supplies such as blood and oxygen.

About Haiti :

Haiti is a country located on the western side of the island of Hispaniola, sharing the island with the Dominican Republic.

Religion: The majority of Haitians are Roman Catholic, with Protestant and Voodoo religions also being practiced .

Tribes: Haiti's population is a mix of African, Amerindian, and European ancestry. This is reflected in the cultural richness of the country, with traditions and languages reflecting these diverse roots.

Population: Haiti's population is estimated to be around 11.4 million (2022 est.)



Haiti Crisis: Haiti faces a number of challenges, including poverty, political instability, gang violence, natural disasters, and food insecurity. These factors have all contributed to a complex humanitarian crisis.

- Gang violence has become a major problem, with gangs controlling large parts of the capital, Port-au-Prince. This violence has led to a rise in kidnappings, murders, and displacement.
- Political instability has also been a major issue, with the assassination of President Jovenel Moïse in 2021 plunging the country into further chaos. There is currently no functioning government in place.

What is Zero Debris Charter (ZDC) ?

Why in News ? Twelve countries and European Space Agency (ESA) have recently signed the Zero Debris Charter (ZDC).

About ZDC:

- The Zero Debris Charter (ZDC) is a new initiative launched by the **European Space Agency (ESA) in November 2023**.
- It's the first of its kind to bring together a wide range of space agencies and organizations around the world.

- **Established in** – 2004 under the framework agreement between ESA and European Union (EU).
- **Objective** – To make space **debris-neutral by 2030**.
- **Signatories** – Austria, Belgium, Cyprus, Estonia, Germany, Lithuania, Poland, Portugal, Romania, Slovakia, Sweden and United Kingdom.

Initiatives for Space Debris Mitigation :

International Cooperation:

- **Inter-Agency Space Debris Coordination Committee (IADC)**: This international forum established in 1993 works on coordinating efforts between spacefaring nations. They issue guidelines for debris mitigation practices.
- **World Economic Forum - Space Industry Debris Mitigation Recommendations**: This 2023 initiative by the World Economic Forum encourages responsible behavior by space industry stakeholders. It sets recommendations for debris mitigation and promotes data sharing and coordination.

Treaties and Policy:

- **Space Debris Mitigation Policies**: Several space agencies like ESA have adopted their own debris mitigation policies. ESA's "**Zero Debris**" approach aims to significantly limit debris generation by 2030.

Outer Space Treaty :

India:

- **Debris Free Space Missions (DFSMS)** by 2030 being implemented by ISRO System for Safe & Sustainable Space Operations Management (IS4OM).
- **Project NETRA** (NEtwork for space object TRacking and Analysis) for Space situational awareness.

UN Military Gender Advocate of the Year Award 2023

Why in News ? Major **Radhika Sen**, an Indian military peacekeeper who served with the United Nations (UN) mission in the **Democratic Republic of Congo**, will be honoured with the 2023 UN Military Gender Advocate of the Year Award. Sen is the second Indian to win this award since its inception in 2016.

About Major Sen:

- **Sen, a native of Himachal Pradesh**, has studied biotechnology and joined the Indian Army in 2016. While pursuing her Masters at Indian Institute of Technology Bombay, she decided to join the armed forces.
- She will receive the award at a ceremony on 30 May, which is also being observed by the UN as the **International Day of UN Peacekeepers**.
- She served in the **North Kivu province**, where the **March 23 Movement (M23)** and the Islamic State-linked **Allied Democratic Forces (ADF)** have been on the offensive in the last few months.

- She served as a part of the United Nations Organisation Stabilisation Mission in the Democratic Republic of Congo (**MONUSCO**) between March 2023 and April 2024, as the Commander of the MONUSCO's Engagement Platoon for the Indian Rapid Deployment Battalion (INDRDB).

About the The UN Military Gender Advocate of the Year Award :

- It recognizes outstanding efforts by military personnel deployed in peacekeeping missions who actively promote gender equality and the empowerment of women.

Who receives the award?

- Military personnel (officers) serving in UN peacekeeping missions around the world.

What are the criteria for receiving the award?

- Protecting women and girls from violence and exploitation.
- Promoting the inclusion of women in peace processes and decision-making.
- Raising awareness about gender equality issues among peacekeeping troops and local communities.
- Developing and implementing programs that empower women economically and socially.
- The award is presented annually.

About The March 23 Movement (M23) :

- It was formed in **2012 to defend Tutsi interests against Hutu militias**, stemming from a 2009 ceasefire agreement.
- It broke away from the **Congolese army**, accusing the government of failing to integrate Tutsis.

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