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Art and Culture

1. Visitors rue lack of facilities at 299-year-old Jantar Mantar

Concept:

- Weeks after the Delhi High Court asked the Archaeological Survey of India (ASI) to file a status report on the functionality of instruments at Jantar Mantar, several visitors expressed their displeasure at the lack of facilities in the 299 year old observatory.

Jantar Mantar

- In the early 18th century, **Maharaja Jai Singh II of Jaipur** constructed five Jantar Mantars in total, in **New Delhi, Jaipur, Ujjain, Mathura and Varanasi**; they were **completed between 1724 and 1735**.
- Jaipur's Jantar Mantar** is a collection of **19 astrological instruments established by Rajput king Sawai Jai Singh II**, the city's founder. In 1734, the monument was completed.
- It is a **UNESCO World Heritage site since 2010**, with the **world's largest stone sundial**.
- The instruments **enable for naked-eye observation of astronomical positions**. The observatory is an example of Ptolemaic positional astronomy, which was widely used.

Jantar Mantar, Delhi

- "Jantar Mantar" means "instruments for measuring the harmony of the heavens".
- It consists of 13 architectural astronomy instruments.**
- The site is one of five built by **Maharaja Jai Singh II of Jaipur, from 1723 onwards**, revising the calendar and astronomical tables.
- The **primary purpose of the observatory was to compile astronomical tables, and to predict the times and movements of the sun, moon and planets**. Some of these purposes nowadays would be classified as astronomy.
- Completed in 1724**, the Delhi Jantar Mantar had decayed considerably by 1857 uprising.
- The **Ram Yantra, the Samrat Yantra, the Jai Prakash Yantra and the Misra Yantra are the distinct instruments of Jantar Mantar**.
- Maharaja Sawai Jai Singh II (1693-1744):**
- He was a **great warrior and astronomer**. He came to power at the age of 12 on the death of his father Maharaja Bishan Singh.
- He was **feudatory of the Mughals** and **Aurangazab conferred the title of Sawai to Jai Singh**, meaning one and a quarter, a title that all of Jai Singh's descendants kept.

- He was trained by the best teachers and scholars in art, science, philosophy and military affairs.
- Jai Sing's lineage can be traced back to the **Kucchwaha Rajput clan** who came to power in the 12th century.
- He built Astronomy Observatories at Delhi, Jaipur, Varanasi, Ujjain and Mathura known as the Jantar Mantar.
- **Jaipur gets its name from him.**

2. Some of 3695 protected structures may lose monument tag

Context: With an aim to redefine monuments and rationalise the use of area around the protected monuments, the government is set to reintroduce the **Ancient Monuments and Archaeological Sites and Remains (AMASR) (Amendment) Bill** in the second half of the Budget session.

More in news:

- Currently, a **monument has to be at least 100 years old**. But sources say there is a **view to change that benchmark** and go back since India has a wealth of ancient monuments, while most '100-year-old monuments pertain to the time of the Britishers'. This is in line with the government wanting to shed 'its colonial past'.
- There is also a likelihood of **redefining 'national importance'** as per the ethos of the country, since several centrally protected monuments were included on the list during the British regime, when the Archaeological Survey of India (ASI) was established.
- These two will pave the way for the denotification of many centrally protected monuments, which currently stand at 3,695.
- Similarly, **no construction work or related activity is generally permitted** in these prohibited and regulated areas in case of all 3,695 protected monuments across the country, **unless a specific approval is taken from the National Monuments Authority (NMA)**.
- As this restricts a lot of areas, it is expected that the amendments will pertain to making some relaxation in these zones, specifically in case of smaller and less significant monuments such as statues, cemeteries and cannons, etc.
- However, in case of **UNESCO World Heritage Sites** (India has 40 of them, including Taj Mahal in Agra, Dholavira in Gujarat, Ramappa Temple in Telangana, and Red Fort and Qutub Minar complexes in Delhi), these **restrictions may stay**, since construction in regulated and prohibited zones may impact these heritage structures.

AMASR Act and ASI

Ancient Monuments and Archaeological Sites and Remains Act, 1958

- The AMASR Act provides for preservation of ancient and historical monuments and archaeological sites and remains of national importance.
- It provides for the regulation of archaeological excavations and for protection of sculptures, carvings and other like objects.
- The **Archaeological Survey of India functions under the provisions of this act**. The Archaeological Survey of India is the custodian of these monuments.
- The Act prohibits construction in 'prohibited area', an area of 100 meters around protected monument.
- It does not permit construction in such prohibited areas even if it is for public purposes, except under certain conditions.
- The **central government can extend the prohibited area beyond 100 meters**.
- The iconic monuments in India, Taj Mahal, Ajanta Caves, The Great Stupa at Sanchi and the Sun Temple of Konark, among others are designated as "ancient monuments of national importance" and protected under the AMASR Act.
- **National Monument Authority** will make a recommendation, for construction of public works to the central government, only if it is satisfied that there is no reasonable possibility of moving the construction outside the prohibited area.

Archaeological Survey of India (ASI)

- ASI, under the Ministry of Culture, is the premier organization for the archaeological research and protection of the cultural heritage of the nation.
- It was founded in **1861 by Alexander Cunningham**– the first Director-General of ASI. Alexander Cunningham is also known as the "Father of Indian Archaeology".
- Its activities include carrying out surveys of antiquarian remains, exploration and excavation of archaeological sites, conservation and maintenance of protected monuments etc.

3. Dickinsonia fossil found in Bhimbetka is old beehive

Concept :

- Fossils of an extinct species of animal (Dickinsonia) that scientists reported in a sensational discovery from India's Bhimbetka Rock Shelters in 2021 have been found to be belied hopes.

Background :

- In 2021, researchers spotted by chance what looked like a 44-cm-wide fossil of Dickinsonia, an animal that lived at least 538 million years ago, in a cave.
- **Dickinsonia fossils** in other parts of the world have indicated it was circular or oval in shape, somewhat flat, with rib-like structures radiating from a central column.

- In 2022, researchers were able to conclude that “the impression resulted from decay of a modern beehive which was attached to a fractured rock surface”.

About Dickinsonia:

- It is an **extinct genus of basal animal that lived during the late Ediacaran period** in what is now **Australia, Russia and Ukraine**.
- These creatures **arose in a world devoid of predators**, and had no need for hard protective carapaces or skeletons.
- The discovery of cholesterol molecules in fossils of Dickinsonia lends support to the idea that Dickinsonia was an animal.

Bhimbetka Caves:

- The Bhimbetka rock shelters are an **archaeological site in central India** that spans the **Paleolithic and Mesolithic periods, as well as the historic period**.
- It exhibits the **earliest traces of human life in India** and **evidence of Stone Age starting at the site in Acheulian times**.
- It is located in the Raisen District in the **Indian state of Madhya Pradesh**.
- It is a **UNESCO World Heritage Site** that consists of seven hills and over 750 rock shelters distributed over 10 km
- At least some of the shelters were inhabited more than 100,000 years ago.
- The Bhimbetka site has the oldest-known rock art in India, as well as is one of the largest prehistoric complexes.
- Bhimbetka meaning “Bhima’s resting place” or “Bhima’s lounge”, is compound word made of Bhima (second brother among the five Pandavas of Mahabharata) and Baithaka (seat or lounge). According to the native belief, Bhima during his exile used to rest here to interact with the locals.

4. Mohiniyattam

Section : Art and Culture

Concept :

- Mohiniyattam exponent **Kanak Rele**, who played a significant role in bringing a systematic structure, academic veracity and much currency to Mohiniyattam, besides propagating female roles in Kathakali, died morning in Mumbai.
- Rele was conferred with the Padma Bhushan in 2013.

About Mohiniyattam

- Mohiniyattam is a **classical dance style from Kerala state** and one of the eight principal Indian classical dance.
- The Mohiniyattam is a popular dance form with a drama in dance, performed with subtle gestures and footwork.

A brief history of the dance form

- Some scholars trace Mohiniattam to the **second or third century A.D.** (to the era of the great Tamil epic, Silappadikaaram), whereas **others maintain that it was created in the middle of the eighteenth century** in the court of Maharaja Svati Tirunal of Travancore
- It is also believed that the **dance form acquired its affinity with the Bharata Natyam technique and Karnatak Music** and thereby its repertoire, in Swati Tirunal’s court.
- In the beginning of the 20th Century, like all the other traditional arts, Mohiniattam also went into oblivion due to the policies of the British.
- During colonial times the dance suppressed but it was revived during national independence movement **by V.N. Menon**.

Salient features associated with the dance-form

- Mohiniyattam is characterized by **graceful, swaying body movements with no abrupt jerks or sudden leaps**. It belongs to the **Lasya style** which is feminine, tender and graceful.
- The most characteristic element of the “form” component of Mohiniattam is the **circular or spiral movement of all the limbs of the body**. This gives it a swaying effect which resembles the movement of a pendulum and **thus it is called aandolika**.
- The movements are emphasized by the glides and the up and down movement on toes, like the waves of the sea and the swaying of the coconut, palm trees and the paddy fields.
- Movements have been borrowed from Nangiar Koothu and female folk dances Kaikottikali and the Tiruvattirakali.
- The footwork is not terse and is rendered softly. **Importance is given to the hand gestures and Mukhabhinaya with subtle facial expressions**.
- Mohiniyattam lays emphasis on acting. The dancer identifies herself with the character and sentiments existing in the compositions like the Padams and Pada Varnams which give ample opportunity for facial expressions.
- The hand gestures, 24 in number, are mainly adopted from **Hastalakshana Deepika**, a **text followed by Kathakali**. Few are also borrowed from **Natya Shastra, Abhinaya Darpana and Balarambharatam**.
- The gestures and facial expressions are closer to the natural(gramya) and the realistic (lokadharmi) than to the dramatic or rigidly conventional (natyadharmi).

- **Vocal music of this performance** art incorporates different rhythms and lyrics of many of the compositions performed in this dance form **are in Manipravala that is a mix of Sanskrit and Malayalam language while the music style is Carnatic.**
- **Instruments played during a Mohiniattam** performance usually comprises of **Kuzhitalam or cymbals; Veena; Idakka, an hourglass-shaped drum; Mridangam, a barrel-shaped drum with two heads; and**
- Imminent **20th-century exponents** of Mohiniattam apart from **Vallathol Narayana Menon were Kalamandalam Kalyanikutty Amma, Thankamony, Krishna Panicker and Mukundraja.**
- **Present day exponents** include **Sunanda Nair; Smitha Rajan, granddaughter of Kalyanikutty Amma; Radha Dutta; Vijayalakshmi; Gopika Varma and Jayaprabha Menon** among others.

Defence

1. Naval LCA lands on Vikrant, first aeroplane to touch down

Concept :

- The naval version of the indigenous Light Combat Aircraft (LCA) Tejas landed on INS Vikrant, which is an indigenous aircraft carrier, marking the maiden landing of a fixed-wing aircraft on **INS Vikrant.**
- INS Vikrant was commissioned into the Indian Navy in September 2022.
- The **landing of LCA** was also followed by the **landing and take-off by a twin-engine MiG-29K fighter jet.**
- Earlier in January 2020, the Defence Research and Development Organisation (DRDO) had demonstrated a successful arrested landing of the naval LCA on INS Vikramaditya.
- The recent development has been regarded as a historic milestone and a step towards achieving “Aatmanirbharta” (self-reliance) in defence.
- Further, the move also demonstrates India’s capability to design, develop, construct and operate IAC with indigenous fighter aircraft.

About INS Vikrant:

- It is country’s maiden **indigenous aircraft carrier (IAC-1).**
- Built by: Cochin Shipyard Ltd.
- The IAC was commissioned in 2022 making it the most potent sea-based asset.
- **Capabilities:** can project Air Power over long distances, including Air Interdiction, Anti-Surface Warfare, offensive and defensive Counter-Air, Airborne Anti-Submarine Warfare and Airborne Early Warning.
- It has a **STOBAR (short take off but arrested recovery)** system of aircraft launch and recovery on the flight deck.
- It is **armed with the Barak LR-SAM** (long range surface-to-air missile) air defence and **AK-630 close-in weapon system** besides a slew of advanced sensors and an electronic warfare suite.

Other specifications:

- It is expected to have a **top speed of 30 knots** (approximately 55 kmph) and is propelled by four gas turbines.
- Its endurance is **7,500 nautical miles at 18 knots (32 kmph)** speed.
- The vessel can carry up to 1,500 personnel and has 2,300 compartments.
- The ship shall operate MiG-29K fighter aircraft, Kamov-31 Air Early Warning Helicopters, the soon to be inducted MH-60R multi-role helicopter and the indigenously manufactured Advanced Light Helicopters.

Economy

1. Economic Survey: Key Takeaways

Section: National Income

Concept:

- On 31 January, the government tabled the Economic Survey 2022-23. The Survey laid out the outlook for India’s growth, inflation and unemployment in the coming years.

Economic Survey

- The Economic Survey of India is an **annual report released by the Finance Ministry.**
- It details the state of the economic performance of the country in the past year.
- The survey **highlights macroeconomic figures and economic progress of the country.**
- It also mentions the possible economic challenges that India might face in future and suggests measures to overcome them.
- The survey is **prepared by the Economic Division of the Department of Economic Affairs in the Ministry of Finance** under the **supervision of the Chief Economic Advisor of India (CEA).**
- The Economic Survey of India is **presented every year a day before the Union Budget is announced.**

- This year's survey was **presented by the CEA V Anantha Nageswaran**, after being tabled by Finance Minister in the parliament.

Economic Survey 2023: Key Takeaways

GDP growth:

- The Survey said India's growth estimate for FY23 is higher than for almost all major economies.
- It projected the **economy to grow by somewhere between 6% -6.8%**, depending on global factors in 2023-24, **with 6.5% a baseline expectation**.
- Despite global uncertainties and slowing world economy, India's growth is supported by solid domestic demand and a pickup in capital investment.
- India's projected growth rate, that too without the advantage of a base effect, is a reflection of India's underlying economic resilience.
- Indian economy in 2022-23 has nearly:
 - **recouped** what was lost,
 - **renewed** what had paused, and
 - **re-energised** what had slowed during the pandemic and since the conflict in Europe.
- The survey also highlighted **few downside risks** which might affect the growth:
 - Low demand for Indian exports due to poor global growth may widen India's trade deficit and make the rupee depreciate.
 - Also, sustained monetary tightening (higher interest rates) may drag down economic activity in FY24.

Inflation

- The RBI has projected **headline inflation at 8% in FY23, outside its comfort zone of 2% -6%**.
- The Survey sounded **optimistic about the inflation levels** and trajectory as both **wholesale and retail inflation are on the descending slope**.
- However, any re-emergence of Covid-19 situation in China or a reversal of slump in commodity prices poses risks to the inflation trajectory going ahead.

Unemployment

- The Survey said **employment levels have risen in the current financial year**.
- It pointed to the **Periodic Labour Force Survey (PLFS)**, which showed that urban unemployment rate for people aged 15 years and above declined from 9.8% in the quarter ending September 2021 to 7.2% one year later.
- The Survey also underlined that the fall in unemployment rate is accompanied by an improvement in the labour force participation rate.

Capital expenditure (capex) target

- Capital expenditure has started to stimulate private investment, and the **budget target of ₹7.5 lakh crore for the current fiscal year** is expected to be met.
- Strong domestic demand and a pickup in capital investment will support the country's growth trajectory in FY24.
- There is an **expectation of a recovery in private capex**, driven by improved balance sheets, resurging credit, and the crowding in from public capex.
- The survey said that the government's thrust on capex, particularly in the infrastructure-intensive sectors like roads and highways, railways, and housing and urban affairs, has longer-term implications for growth.
- **PM Gati Shakti** has additionally assisted in accelerating infrastructure development.

Foreign Direct Investment (FDI) inflows

- Due to India's rapid economic growth and enhanced business environment, FDI into the nation is anticipated to increase in the upcoming months.
- According to data from the Department for Promotion of Industry and Internal Trade (DPIIT), FDI equity inflows into India decreased by 14% to USD 26.9 billion over the period from April to September this fiscal.

Current Account Deficit (CAD)

- The need for careful monitoring of the current account deficit, which **could continue to grow due to elevated global commodity prices, was emphasised**.
- The **country's current account deficit increased to 4.4% of GDP** in the quarter ending in September from 2.2% of GDP during the April-June period (RBI Data).
- **Rupee likely to remain under depreciation pressure**
- The pressure on the Indian rupee's depreciation may continue as a **result of the export market's slowing and the subsequent expansion of the current account deficit**.

Suggestions given by Survey

- The Survey has called for:

- **entirely dismantling the LIC (licensing, inspection and compliance) regime** to accelerate economic growth,
- harnessing women power (nari shakti),
- renewed focus on energy security and energy transition, education and skilling, administrative reforms.
- The survey sought determined **efforts to make public sector asset monetisation scheme successful**, besides addressing (by states) of the power sector issues.
- The Survey has also placed sufficient **emphasis on fiscal consolidation**, which it notes is critical for low interest rates in the long term.

2. Promoting International Trade in Rupee to Help Reduce Currency Volatility

Concept:

- **Promoting international trade in the domestic currency** will help in protecting the rupee from volatility and reduce cost of doing business in the global markets, Economic Survey said on Tuesday.
- **INR as International Currency**
- The Survey highlights that efforts are underway to promote international trade settlement in Indian Rupees.
- International settlement in rupee acquires **significance against the backdrop of the US Federal Reserve aggressively hiking the policy rates and its hawkish stand.**
- Once these initiatives gain traction, dependence on foreign currency would potentially reduce, making the economy less vulnerable to external shocks.
- In July 2022, the **Reserve Bank of India (RBI) issued a circular** permitting an additional **arrangement for invoicing, payment, and settlement of exports/imports in Indian Rupees (INR)** to promote the growth of global trade with emphasis on exports from India and to **support the increasing interest in the global trading community in INR as an international currency.**
- The framework involves invoicing of exports and imports in INR, market-determined exchange rates between the currencies of the trading partner countries, and settlement through **special Rupee Vostro accounts opened with authorised dealer banks in India.**
- The Survey states that the framework is significant as this could largely reduce the net demand for foreign exchange and could assist Indian exports in getting advance payments in Indian Rupees from overseas clients.
- It mentions that in the longer terms this could promote Indian rupees as an international currency once the rupee settlement mechanism gains traction.

Special Rupee Vostro accounts

- The settlement of trade **transactions under this arrangement shall take place in INR.**
- In terms of **Regulation 7(1) of Foreign Exchange Management (Deposit) Regulations, 2016**, Authorised Dealer banks in India have been **permitted to open Rupee Vostro Accounts.**
- For settlement of trade transactions with any country, AD banks in India may open Special Rupee Vostro Accounts of correspondent bank/s of the partner trading country.
- In order to allow settlement of international trade transactions through this arrangement, it has been decided that:
 - **Indian importers** undertaking imports through this mechanism shall make payment in INR which shall be credited into the Special Vostro account of the correspondent bank of the partner country, against the invoices for the supply of goods or services from the overseas seller /supplier.
 - **Indian exporters**, undertaking exports of goods and services through this mechanism, shall be paid the export proceeds in INR from the balances in the designated Special Vostro account of the correspondent bank of the partner country.
- **Use of Surplus Balance:** The Rupee surplus balance held may be used for permissible capital and current account transactions in accordance with mutual agreement. The balance in Special Vostro Accounts can be used for:
 - Payments for projects and investments.
 - Export/Import advance flow management
 - Investment in Government Treasury Bills, Government securities, etc. in terms of extant guidelines and prescribed limits, subject to FEMA and similar statutory provision.

Vostro account:

- Vostro is a Latin word that translates to “your,” as in “your account.”
- A vostro account is an **account a correspondent bank holds on behalf of another bank.**
- A vostro account is established **to enable a foreign correspondent bank to act as an agent or provide services as an intermediary for a domestic bank.**
- Vostro account services include **executing wire transfers, performing foreign exchange transactions, enabling deposits and withdrawals, and expediting international trade.**
- For example, if a Spanish life insurance company approaches a U.S. bank to manage funds on the Spanish life insurer’s behalf, the account is deemed by the holding bank as a vostro account of the insurance company.
- From the **foreign correspondent bank’s point of view**, the funds held on behalf of other banks are **referred to as vostro accounts** and are denominated in the local currency.

- From the **perspective of domestic banks**, the funds deposited at correspondent banks are referred to as **nostro accounts**.
- **Nostro accounts are denominated in the foreign currency of the correspondent bank.**

3. Shipbuilding industry can bolster 'Aatmanirbhar Bharat', says Survey

Section: National Income

Concept:

- Identifying the shipbuilding industry as a strategically important industry for its role in energy security, national defence, and the development of the heavy engineering industry, the Economic Survey, 2022-23 noted that it has the potential to increase the contribution of the industry and the services sector to the national GDP.
- Based on **international shipbuilding statistics**, if one takes a conservative **Marginal Consumption to GDP Ratio (MCGR) of 0.45** for the shipbuilding sector, the **investment multiplier would be approximately 1.82**.
- For example, an injection of approximately ₹1.5 lakh crore in naval shipbuilding projects would accrue a circulation of ₹2.73 lakh crore in the shipbuilding sector due to the multiplier effect," the survey said.

Investment Multiplier

- Investment multiplier is an important part of economic theories suggested by notable **economist John Maynard Keynes**.
- According to this concept, in the **event of an increase in the investment activities** either public or private which can be in the form of private consumption spending, government spending in an economy, there is a **corresponding increase in the Gross Domestic Product (GDP) of the economy by a value more than the amount invested**.
- In simple words, **investment multiplier** refers to the **increase in the aggregate income of the economy** as a result of an **increase in the investments done by the government in the form of new projects**.
- The size of the investment multiplier is determined by the **decisions of the households** in an economy in the **areas of spending (which is known as marginal propensity to consume) or saving (known as marginal propensity to save)**.
- The multiplier can be represented by the following formula,
- $K = \Delta Y / \Delta I$
- Where,
 - ΔY = Increase in GDP or National Income
 - ΔI = Increase in Investment
- **Marginal Propensity to Consume (MPC)**
- It measures the proportionate rise in the consumption with increase in income or we can say it measures the proportion of extra pay that is spent on consumption of goods and services rather than saving it.
- Marginal Propensity to Consume or MPC is dependent on the income level. It may vary with the income levels and it can be seen that the MPC is lower at higher income levels.
- MPC can be calculated by determining the change in consumption divided by the change in income.
- **Marginal propensity to save (MPS)**
- It is used by economists in order to quantify the relationship between changes in income and changes in savings. It refers to the **proportion of a raise in pay that a consumer saves rather than uses for consuming goods and services**.
- It is calculated by simply dividing the change in savings by the change in income.
- A larger MPS indicates that small changes in income lead to large changes in savings, and vice-versa.

4. Adani Enterprises FPO subscribed 1.1 times; HNIs, QIBs to the rescue

Section: Capital Market

Concept :

- On the last day of Adani Enterprises' follow-on public offer, the issue was home and dry with the **total book getting subscribed 1.1 times, aided by qualified institutional buyers and high net-worth individuals**.
- Despite the damaging allegations made by short-seller hedge fund Hindenburg Research, which wiped out a considerable portion of promoter Gautam Adani's wealth and the group's market capitalisation, the company's confidence that the FPO would go through was justified.
- QIB subscription at 161 lakh shares was 1.26 times of the offer for that category.
- Subscriptions from non-institutional investors were 3.3 times, while within that those bidding for amounts above ₹10 lakh put in bids that were nearly 5 times of the shares on offer.

Qualified Institutional Buyers

- Qualified Institutional Buyer is a purchaser of securities that is financially sophisticated and is legally recognized by security market regulators to **need less protection from sellers than most members of the public**.
- Qualified Institutional Buyers are **those institutional investors who are generally perceived to possess expertise and the financial muscle to evaluate and invest in the capital markets**.
- **Qualified Institutional Buyer shall mean:**
 - Public financial institution as defined in section 4A of the Companies Act, 1956;
 - Scheduled commercial banks;

- Mutual funds;
- Foreign institutional investor registered with SEBI;
- Multilateral and bilateral development financial institutions;
- Venture capital funds registered with SEBI.
- Foreign Venture capital investors registered with SEBI.
- State Industrial Development Corporations.
- Insurance Companies registered with the Insurance Regulatory and Development Authority (IRDA).
- Provident Funds with minimum corpus of Rs.25 crores
- Pension Funds with minimum corpus of Rs. 25 crores
- These entities are not **required to be registered with SEBI as QIBs**.
- **QIBs must be either domestic or foreign institutions**.
- **Individuals are not permitted to be QIBs**, regardless of their level of wealth or financial sophistication.

5. Capex-led growth

Section : Fiscal Policy

Context: Capex-led growth to bring back animal spirits, help manage debt levels: Economic Survey.

More on the News:

- Survey said the government's thrust on capex, particularly in the **infrastructure-intensive sectors like roads and highways, railways, and housing and urban affairs, has longer-term implications for growth**.
- Central to the government's growth optimism in FY24 is the **expectation of a recovery in private capex, driven by improved balance sheets, resurging credit, and the crowding in from public capex**.
- Growth is expected to be brisk in FY24 as a **vigorous credit disbursal, and capital investment cycle** is expected to unfold in India with the strengthening of the balance sheets of the corporate and banking sectors.
- While on the one hand, capital expenditure **strengthens aggregate demand and crowds-in private spending in times of risk aversion**; it also enhances the longer-term supply-side productive capacity

Capital expenditures

- Capital expenditures are the ones that **create some liability/asset for the government**. These include loans to public enterprises, loans to States, Union Territories and foreign governments and acquisition of valuables.
- They are **long-term investments of huge amount of money for acquiring long-term assets** like manufacturing equipment. Such assets acquired provide income-generating value over a period of years.
- Hence, the **cost of such assets is recovered through year-by-year depreciation over the productive life of the asset**. In essence, the expenditure which is done for initiating current, as well as the future economic benefit, is actually capital expenditure.
- Capital expenditure includes money spent on the following:
 - Acquiring fixed and intangible assets
 - Upgrading an existing asset
 - Repairing an existing asset
 - Repayment of loan

Significance of capital expenditure:

- **Multiplier effect**– Capex has the maximum multiplier effect (change in rupee value of output with respect to a change in rupee value of expenditure). **This multiplier effect works through expansion of ancillary industries and services and job creation**.
- **Labour productivity**– On the supply side, Capex can facilitate labour productivity.
- **Macroeconomic stabilizer**– Capital expenditure is an **effective tool for countercyclical fiscal policy** and acts as a macroeconomic stabiliser.
- **Revenue generation**– Capital expenditure leads to the creation of assets are long-term in nature and allow the economy to **generate revenue for many years and boost operational efficiency**.
- **Liability reduction**– Along with the **creation of assets, repayment of loan** is also capital expenditure as it reduces liability.
- **Economic growth** – Government capex **catalyses private investment, increases production capacity thereby speeding up economic growth** which in turn creates a lot more jobs.
- **Crowding-in of investment**: It is a phenomenon that occurs when higher government spending leads to an increase in economic growth and therefore encourages firms to invest due to the presence of more profitable investment opportunities. The crowding-in effect is observed when there is an increase in private investment due to increased public investment, for example, through the construction or improvement of physical infrastructures such as roads, highways, water and sanitation, ports, airports, railways, etc.

6. Foreign Exchange Reserve

Context: India has sufficient forex reserves to finance CAD and intervene in forex market: Eco Survey

Findings in Economic Survey:

- India's forex reserves, as on January 20, stood at **\$573.727 billion**.
- The country recorded a current account deficit of **3 per cent of GDP** in H1 FY23
- Reason for rising CAD
 - Sharp increase in the **merchandise trade deficit**.
 - Current Account Balance stems from a **swift recovery driven mainly by domestic demand and, to a lesser extent, by exports**.
 - It have added to the **domestic inflationary pressures** besides widening the CAD.
 - **Global commodity prices may have eased** but are still higher compared to pre-conflict levels. They have further widened the CAD, already enlarged by India's growth momentum.
- The survey underscored that the scenario of subdued global growth presents **two silver linings – oil prices will stay low, and India's CAD will be better than currently projected**. The overall external situation will remain manageable.
- As of end-November 2022, India was the **sixth largest foreign exchange reserves holder** in the world according to data compiled by the IMF.
- The **import coverage of foreign currency reserves** has declined since the pre-pandemic levels in most emerging market economies; however, that of India has **increased from 95 per cent in Q4 2019 to 96.5 per cent in Q3 2022**.
- There is a cost involved in holding them and they are subject to diminishing returns. The costs borne by an economy for holding FER include the **opportunity cost**, in terms of the **difference between domestic and foreign borrowing rates** and loss due to the value reduction in the denominated FER.
- The survey points out that it examines the **social cost of FERs** and finds that the income **loss to most developing countries amounts to close to one per cent of GDP**.

Foreign Exchange Reserve:

- Foreign exchange reserves are **assets held on reserve by a central bank in foreign currencies**, which can include bonds, treasury bills and other government securities.
- It needs to be noted that **most foreign exchange reserves are held in US dollars**.

India's Forex Reserve include:

- Foreign Currency Assets
- Gold reserves
- Special Drawing Rights
- Reserve position with the IMF
- **Foreign Currency Assets:**
 - FCAs are assets that are **valued based on a currency other than the country's own currency**.
 - FCA is the **largest component of the forex reserve**. It is **expressed in dollar terms**.
 - The FCAs include the **effect of appreciation or depreciation of non-US units** like the euro, pound and yen held in the foreign exchange reserves.
- **Gold Reserves:**
 - Gold occupies a special position in the foreign reserves of central banks as it is widely stated to be **held for reasons of diversification**.
 - Moreover, the unique property of gold is believed to be **its ability to enhance the credibility of the central bank when it holds adequately** and this has been proved time and again.
- **Special Drawing Rights:**
 - The SDR is an **international reserve asset, created by the International Monetary Fund (IMF) in 1969** to supplement its member countries' official reserves.
 - The SDR is neither a currency nor a claim on the IMF. Rather, it is a **potential claim on the freely usable currencies of IMF members**. SDRs can be exchanged for these currencies.
 - The **value of the SDR is calculated from a weighted basket of major currencies**, including the US dollar, the euro, Japanese yen, Chinese yuan, and British pound.
 - The **interest rate on SDRs or (SDRi)** is the interest paid to members on their SDR holdings.
- **Reserve Position in the International Monetary Fund:**
 - A reserve tranche position implies a **portion of the required quota of currency each member country must provide to the IMF** that can be utilized for its own purposes.
 - The reserve tranche is basically **an emergency account that IMF members can access** at any time without agreeing to conditions or paying a service fee.

Significance of rising forex reserves:

- The rising forex reserves **give comfort to the government and the RBI in managing India's external and internal financial issues** at a time of major contraction in economic growth.
- It serves as a cushion in the event of a crisis on the economic front, and is **enough to cover the import bill of the country for a year**.
- The rising reserves have also helped the **rupee to strengthen against the dollar**. The foreign exchange reserves to GDP ratio is around **15 per cent**.
- Reserves will provide a **level of confidence to markets that a country can meet its external obligations, demonstrate the backing of domestic currency** by external assets, assist the government in meeting its foreign exchange needs and external debt obligations and maintain a reserve for national disasters or emergencies.

7. Electronic Gold Receipts

Section: Fiscal Policy

Context: No capital gains on conversions between physical gold and EGR: Budget 2023.

More on the News

- **Electronic Gold Receipts (EGRs)** were launched by BSE last October. EGRs are **digital receipts of gold issued against the amount of physical gold** lying with vault providers.
- There was a grey area with respect to capital gains when one converted his/her physical gold to EGRs.
- In the Union Budget 2023-24, it is clarified that there **will not be any capital gain tax when physical gold is converted to EGR** and vice-versa effective April 1, 2024. While other charges like brokerage, GST are not exempt.
- The advantage is that, for calculating the holding period, date and purchase price of your physical gold will be considered and not the date when it was converted to EGR. So, the **total holding period would be the time held in physical form plus the time held it as EGR**.
- So, basically, have to **pay tax only on encashment whereas there will be no tax liability if you continue to hold gold in one form or the other**.

Electronic Gold Receipts

- EGRs are digital receipts of gold issued against the amount of physical gold lying with vault providers.
- These receipts are issued by the vault managers and will be in accordance with **SEBI (Securities and Exchange Board of India) regulations**.
- They can be **bought and sold like stocks** through exchanges.
- EGRs allow people to invest in gold from a very small amount and also provide the option of taking delivery.
- One can also convert their physical gold into EGRs **through a registered vault member**.
- Under this form of gold, the trading exchange holds the underlying value of the receipt in physical gold in a vault.
- That means investors **buy the gold in dematerialised form** and are given gold receipts instead of physical gold. The process is similar to the physical form of equity shares.

Capital Gains Tax

- Under the Income Tax Act, **gains from the sale of capital assets, both movable and immovable, are subject to 'capital gains tax'**. It covers real estate, gold, stocks, mutual funds, and various other financial and non-financial assets.
- According to the Income Tax Act, **if a person inherits property and does not sell it, no capital gains tax is required**. However, if the person who inherited the property decides to sell it, he or she will have to pay tax on the earnings.
- **Exclusions:** The following items are **not considered capital assets**:
 - Any stock, consumables, or raw materials stored for business or profession.
 - Personal items held for personal use, such as clothing and furniture
 - **Agricultural land in India's rural areas**
 - The central government's 6½% per cent gold bonds (1977) or 7 per cent gold bonds (1980) or national defence gold bonds (1980).
 - **Special bearer bonds (1991)**
 - A gold deposit bond or deposit certificate issued under the Gold Deposit Scheme (1999) or the Gold Monetisation Scheme (2015).
- **Types:**
 - **Short-term capital gains tax**
- Normally if an asset is **held for less than 36 months**, any gain arising from selling it is treated as a short-term capital gain (STCG).
- The term for **immovable assets**, such as real estate, buildings, and land, has been decreased from 36 to **24 months**.
- **Long-term capital gains tax**
 - If the asset is held for **36 months or more**. However, **Shares and equity mutual funds with a holding period of 12 months or more** qualify as 'long-term'.
 - Current tax laws state LTCG arising on the sale of listed equity shares or equity oriented mutual funds are exempt from tax if one pays Securities Transaction Tax (STT) on the sale transaction.

- Any of the assets listed below are considered long-term investments if you own them for **more than a year**:
- **Zero-Coupon Bonds** (not dependent on whether they are quoted or not)
- **Units of the Unit Trust of India (UTI)** (not dependent on whether they are quoted or not)
- **Units of equity-based mutual funds** (not dependent on whether they are quoted or not)
- **Securities that are listed on a recognised Indian stock market.** Government securities, bonds, and debentures are examples of such securities.
- **Preference shares or stocks held in a corporation** that is listed on a recognised stock exchange in India.

8. Capital expenditure

Section : Fiscal Policy

Context : Continuing with the template of the last couple of years, the Budget is big on capital expenditure which is by a whopping 37 per cent at ₹10 lakh crore, accounting for 3.3 per cent of GDP

Concept –

- The central theme of the Budget 2022-23 was investment in infrastructure, and development.
- Sitharaman announced capital expenditure at ₹7.5-lakh crore. That's about **2.9 per cent of GDP**.
- Together with grant-in-aid to States, the **effective capital expenditure for 2022-23** is projected to be about 4.1 per cent of GDP. The nominal GDP growth assumption of

What is Capital Expenditure-?



- Capital expenditure (Capex) is the money spent by the government on the development of machinery, equipment, building, health facilities, education, etc.
- Capital expenditure includes money spent on the following:
 - Acquiring fixed and intangible assets
 - Upgrading an existing asset
 - Repairing an existing asset
 - Repayment of loan

Capital Expenditure	Revenue Expenditure
Capital expenditure is the expenditure by the government for the development of fixed assets.	Revenue Expenditure is the expenditure by the government which does not impact its assets or liabilities.
Along with the creation of assets, it also includes repayment of loan.	It includes salaries, interest payments, pension, and administrative expenses.
If an item has a useful life of more than one year, it is be capitalized (i.e., can be considered CapEx).	If an item has a useful life of less than one year, it shouldn't be capitalized (i.e., cannot be considered CapEx).
Capital expenditure is a payment for goods or services recorded – or capitalized – on the balance sheet	Revenue Expenditure must be expensed on the income statement instead on the balance sheet.

What is the status of Government spending on capital expenditure?

- The outlay for capital expenditure in the Union Budget is being stepped up sharply by 35.4 per cent from Rs 5.54 lakh crore in the current year to Rs 7.50 lakh crore in 2022-23.
- The States cumulatively spend more on capex than the Centre.
- But, the money spent by states is not uniform throughout the year but is bunched up and spent in the last quarter of the fiscal.
- Both the Centre and the States should also focus on the quality of capex.
- It is necessary if India has to escape its current moderate pace of economic expansion and post strong double digit GDP growth in a sustained manner in the future.

9. Inclusive growth

Section: National income

Context: Budget 2023-24 is a bold step towards envisioning a prosperous and inclusive India

- Inclusive growth means economic growth that creates employment opportunities and helps in reducing poverty.
- It means having access to essential services in health and education by the poor. It includes providing equality of opportunity, empowering people through education and skill development.
- It also encompasses a growth process that is environment friendly growth, aims for good governance and helps in creation of a gender sensitive society.
- As per OECD (Organisation for Economic Co-operation and Development), inclusive growth is economic growth that is distributed fairly across society and creates opportunities for all.



Components of Economic Growth -

10. Decentralised storage capacity

Section: Msc

Context: India will have world's largest decentralised storage capacity: Union Cooperation Minister.

More on the News:

- With the Budget announcement to set up decentralised storage capacity, Union Cooperation Minister said India will have the **world's largest decentralised storage capacity by the cooperative sector** which will help farmers store their produce and sell at the right time to get a fair price.
- This will play an important role in to increase the income of farmers.
- In the next five years, the government will facilitate the **establishment of new multipurpose cooperative societies**, primary fisheries societies and dairy cooperative societies in every panchayat.
- FM announced a **higher limit of ₹2 lakh per member for cash deposits** and loans in cash by Primary Agricultural Co-operative Societies (PACS) and Primary Co-operative Agriculture and Rural Development Banks (PCARDBs).
- New cooperative societies formed on or after April 2023, which commence manufacturing or production by March 2024 and do not avail of any specified incentive or deduction, are proposed to be allowed an **option to pay tax at a concessional rate of 15 per cent similar to what is available to new manufacturing companies**.
- Sections 269SS and 269T of the Companies Act will be amended to ensure there is **no penalty for cash loan/transactions against primary co-operatives** in cash less than ₹2 lakh.
- It is proposed to enable **co-operatives to withdraw cash up to ₹3 crore in a year** without being subjected to TDS on such withdrawal.

Cooperatives

- According to the International Labour Organisation (ILO), a cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise.

- The United Nations General Assembly had declared the year 2012 as the **International Year of Cooperatives**.
- India is an agricultural country and laid the foundation of World's biggest cooperative movement in the world.

Constitutional Provisions Related to Cooperatives:

- The **Constitution (97th Amendment) Act, 2011** added a new Part IXB right after Part IXA (Municipals) regarding the cooperatives working in India.
- The word “cooperatives” was added after “unions and associations” in Article 19(1)(c) under Part III of the Constitution. This enables all the citizens to form cooperatives by giving it the status of fundamental right of citizens.
- A new Article 43B was added in the Directive Principles of State Policy (Part IV) regarding the “promotion of cooperative societies”.
- Cooperatives are a **State subject**

11. Remittances high, low tax payment

Section: Fiscal Policy

Context: Finance Secretary said the measures have been taken based on information that people are **making high-value remittances but their tax returns are not reflecting proportionate income tax payments**.

More on the News:

- To **trace high-value spending and tax avoidance** by high net-worth individuals, the government announced a **sharp hike in the tax collected at source (TCS) rate — to 20 per cent from 5 per cent**, on overseas tour packages and on certain remittances out of India under the liberalised remittance scheme (LRS)
- This has been proposed with the **exception of LRS remittances for education and medical treatment purpose**
- The Finance Bill, through the Budget 2023-24, **amended Section 206C of the Income Tax Act** levying a higher TCS on overseas tour programme packages.
- Also, **20 per cent TCS will be applicable on certain remittances without any threshold** as against the current scenario of 5 per cent tax rate where funds in excess of Rs 7 lakh are sent out of India under the Liberalised Remittance Scheme of the RBI.
- The amendments will come into **effect from July 1, 2023**.

About Liberalised remittance scheme:

About Liberalised Remittance Scheme (LRS):

Under the Liberalised Remittance Scheme, all resident individuals, including minors, are allowed to freely remit up to USD 2,50,000 per financial year (April – March) for any permissible current or capital account transaction or a combination of both.

The Scheme was introduced on February 4, 2004, with a limit of USD 25,000. The LRS limit has been revised in stages consistent with prevailing macro and micro economic conditions.

Individuals can avail of foreign exchange facility for the following purposes within the LRS limit of USD 2,50,000 on financial year basis:

- Private visits to any country (except Nepal and Bhutan)
- Gift or donation
- Going abroad for employment
- Emigration
- Maintenance of close relatives abroad

- Travel for business, or attending a conference or specialised training or for meeting expenses for meeting medical expenses, or check-up abroad, or for accompanying as attendant to a patient going abroad for medical treatment/ check-up
- Expenses in connection with medical treatment abroad
- Studies abroad
- Any other current account transaction which is not covered under the definition of current account in FEMA 1999.

The Scheme is not available to corporates, partnership firms, HUF, Trusts etc. **The remittance facility under the Scheme is not available for the following:**

- Remittance for any purpose specifically prohibited under Schedule-I (like purchase of lottery tickets/sweepstakes, proscribed magazines, etc.) or any item restricted under Schedule II of Foreign Exchange Management (Current Account Transactions) Rules, 2000.
- Remittance from India for margins or margin calls to overseas exchanges / overseas counterparty.
- Remittances for purchase of FCCBs issued by Indian companies in the overseas secondary market.
- Remittance for trading in foreign exchange abroad.
- Capital account remittances, directly or indirectly, to countries identified by the Financial Action Task Force (FATF) as “non- cooperative countries and territories”, from time to time.
- Remittances directly or indirectly to those individuals and entities identified as posing significant risk of committing acts of terrorism as advised separately by the Reserve Bank to the banks.

Individuals can also open, maintain and hold foreign currency accounts with banks outside India for carrying out transactions permitted under the scheme.

12. PAN to be used as common identifier for digital systems

Section : Fiscal Policy

Concept :

- Finance Minister Nirmala Sitharaman on Wednesday, February 1 said **Permanent Account Number (PAN) will be used as a common identifier for all digital systems of specified government agencies**
- The move would help in further **promoting ease of doing business in the country.**
- **Significance**
- PAN is a **10-digit alphanumeric number allotted by the income tax department to a person, firm or entity.**
- PAN enables the **department to link all transactions of the “person” with the department.**
- These transactions include tax payments, TDS/TCS credits, returns of income, specified transactions, correspondence, and so on.
- PAN, thus, acts as an identifier for the “person” with the tax department.
- She also said that if MSMEs fail to execute contracts, 95 per cent of performance security will be returned to small businesses as **part of Vivad Se Vishwas scheme.**

Vivad Se Vishwas Scheme:

- The scheme provides for settlement of disputed tax, disputed interest, disputed penalty or disputed fees in relation to an assessment or reassessment order on payment of 100% of the disputed tax and 25% of the disputed penalty or interest or fee.
- The Direct Tax Vivad se Vishwas Act, 2020 was enacted in March 2020 to settle direct tax disputes locked up in various appellate forums.
- As many as 1.25 lakh cases, a quarter of all direct disputes, have opted for Vivad se Vishwas scheme, enabling settlement of Rs. 97,000 crore in tax demands.

13. Mahila Samman Saving Certificate

Section: Fiscal policy

Concept:

- Finance Minister recently announced a new saving scheme 'Mahila Samman Saving Certificate' for women and girls in the Union Budget.

Mahila Samman Saving Certificate Scheme:

- The scheme offers **deposit facility up to Rs 2 lakh** in the **name of women or girls** for a **tenor of 2 years**.
- It offers **fixed interest rate of 7.5 per cent**.
- There are **no tax benefits, but partial withdrawal is allowed** in this scheme.
- This is a **one-time scheme** announced in Budget 2023 and will **remain available for a two-year period i.e. up to March 2025**.
- **Benefit:** It will encourage more women to adopt formal financial saving instruments.

14. New policy of UPI for NRI

Section :Msc

Concept :

- The **National Payments Corporation of India (NPCI)** paved the way for **international (phone) numbers to be able to transact using UPI**.
- The **Union Cabinet** also approved an incentive scheme with an outlay of **₹2,600 crores** for the promotion of **RuPay debit Cards and low-value BHIM-UPI transactions** (person-to-merchant) in FY 2022-23.
- As per the DigiDhan dashboard maintained by the Ministry of Electronics and Information Technology, BHIM-UPI accounted for 52% of all digital payments in FY 2021-22.

International numbers:

- **Non-resident accounts** such as non-resident external accounts (NRE) and non-resident ordinary accounts (NRO), **having international numbers, will now be allowed into the UPI payment system**.
- NRE accounts are those used by non-residents to transfer earnings from foreign countries to India while NRO accounts are used to manage income earned in India by non-residents. These incomes could be rent, interest, and pension, among other things.
- **At present, users from 10 countries will be able to avail of the facility**. They are **Singapore, Australia, Canada, Hong Kong, Oman, Qatar, the U.S., Saudi Arabia, UAE, and the U.K.**
- It will allow NRIs to use the payment method for making utility bill payments for their families (or themselves) in India, make purchases from e-commerce or online platforms and make payments to physical merchants who accept UPI QR-based payments when they travel to India.

Merchant Discount Rate

- Presently, **there is no MDR charge levied for RuPay-based debit card and UPI transactions**.
- The **merchant discount rate** is the rate charged to a merchant for payment processing services on debit and credit card transactions.
- It is **collected by the acquirer to compensate the varied service providers and intermediaries in the payment system**.

Unified Payments Interface

- **Unified Payments Interface (UPI)** is an **instant real-time payment system** developed by the National Payments Corporation of India.
- The interface **facilitates inter-bank peer-to-peer and person-to-merchant**
- It is used on mobile devices to instantly transfer funds between two bank accounts.

15. Zero tax for annual income up to 7 lakhs under new scheme – Tax slab

Section :Fiscal Policy

Concept :

- The central government made a much-awaited mega announcement on increasing the income level up to which no income tax is payable: ₹ 7 lakh a year from the 2023-24 financial year. It was Rs 5 lakh so far.
- This change is **only for those who choose the New Tax Regime**.
- **Tax surcharges** of the taxpayers in the highest tax bracket **were reduced from 37% to 25%**.
- Also, Finance minister in her budget for 2023-24 allowed a **standard deduction of 50,000 under the new tax regime**.
- After listing out the slabs, the minister also announced that the Old regime — which has higher tax rates but several exemptions — will only be available on request now, and the **New regime will thus be considered the default system for everyone**.

Revised Tax Slab

- A **five-slab structure** will **apply now under the New regime**, also raising the no-tax slab by ₹ 50,000.
- Income between ₹ 0-3 lakh will have no tax; it was zero to ₹ 2.5 lakh earlier.

- **From then on:**
- Income part from ₹ 3 lakh and 6 lakh will be taxed at 5 per cent;
- Rs 6 lakh to ₹ 9 lakh, at 10 per cent;
- Rs 9 lakh to 12 lakh, 15 per cent;
- Rs 12 lakh to 15 lakh will attract a 20-per-cent tax; and
- The part of income going above ₹ 15 lakh will be taxed at 30 per cent.
- The minister also brought down the highest applicable tax rate in India after surcharges, from 42.7 per cent to 39.
- Rates and slabs under the Old Tax Regime remain unchanged.

16. Important Budget Terms

Section: National Income

Concept:

Nominal GDP and Real GDP

- Nominal GDP refers to the **current year production of final goods and services** valued at **current year prices**.
- Real GDP refers to the **current year production of goods and service** valued at **base year prices**. Base year prices are **constant prices**.
- Currently, the **base year for GDP calculation is 2011-12**.
- **GDP Deflator**
- The **ratio of nominal to real GDP** is a well-known index of prices. This is called GDP deflator.
- **GDP Deflator** = Nominal GDP/ Real GDP
- The GDP deflator is, therefore, a measure of inflation.
- **If GDP deflator is 2, then it means prices are doubled as compared to base year.**
- The GDP deflator is considered the better measure of price behavior because it covers all goods and services produced in the country.

Crowding out and Crowding in Effect

- When the government pursues expansionary fiscal policy (higher spending financed by borrowing) there are two possible effects :
- **Crowding out – higher government spending** financed by borrowing leads **to a fall in private sector saving**. This is for two main reasons
- With expansionary fiscal policy, private sector savers buy government bonds and so have fewer savings to fund private sector investment.
- Also, higher government borrowing tends to push up interest rates and these higher interest rates reduce investment.
- **Crowding in** – this relates to how **higher government spending encourages firms to invest more**.
- This is **due to the income effect of higher government spending**.
- If the economy is in a recession or below full capacity, expansionary fiscal policy can increase the economic growth rate and create a positive multiplier effect, which leads to greater private sector investment.

Sticky Inflation

- Sticky inflation is an **undesirable economic situation where there is a combination of stubbornly high inflation and often stagnant growth**.
- Sticky inflation is often associated with cost-push factors, i.e. factors which **cause a rise in the inflation rate but also lead to lower spending and economic growth**.
- In **2008 financial crisis**, we experienced a **rise in inflation, but economic growth fell** leading to recession.
- In 2011, we had a similar rise in inflation, but a fall in the growth rate.

17. Angel Tax extended to foreign investors

Section: Fiscal Policy

Concept :

- In Budget 2023-24, the government has proposed to **extend the so-called ‘angel tax’ provisions to transactions involving foreign investors**.
- According to the proposal, the excess premium received on sale of shares by an Indian unlisted company to a foreign investor will be construed as “income from other sources” and subject to tax.

Angel Tax

- Angel Tax is a **term basically used to refer to the income tax payable on the capital raised by unlisted companies** via the issue of shares **through off-market transactions**.
- This tax is levied on the capital raised via the issue of shares by unlisted companies from an Indian investor if the share price of issued shares is seen in excess of the fair market value of the company.

- The **excess realization is considered as income** and therefore, **taxed accordingly**.
- , If the fair market value of a start-up share is Rs 10 a piece, and in a subsequent funding round they offer it to an investor for Rs 20, then the difference of Rs 10 would be taxed as income.
- Angel tax gets its name from the wealthy individuals (“angels”) who invest heavily in risky, unproven business ventures and start-ups, in the initial stages when they are yet to be recognized widely.

What was the rationale behind introducing Angel Tax?

- Rule related to Angel Tax is described in Section 56(2) (viib) of the Income Tax Act, 1961.
- This clause was inserted into the act in 2012 **to prevent laundering of black money, round tripping via investments with a large premium into unlisted companies**.

Which investments used to fall under the ambit of Angel Tax?

- Before budget 2023-24, angel tax was **imposed only on investments made by a resident investor**.
- i.e., it was not applicable in case the investments are made by any non-resident or venture capital funds.
- Allaying the concerns of the startup community, the **govt had exempted investments made by the domestic investors in companies approved by an inter-ministerial panel** from Angel Tax.
- i.e., Government recognized startups, upon meeting certain criteria, were exempted from this tax.

What is the proposed change in Budget 2023-24 with respect to angel tax?

- The Finance Bill, 2023 has proposed to amend Section 56(2) VII B of the Income Tax Act.
- With this, the **government has proposed to include foreign investors in the ambit**, meaning that when a start-up raises funding from a foreign investor, that too will now be counted as income and be taxable.
- However, these **foreign investors will not need to pay any angel tax while investing in a government-recognized** (Department for Promotion of Industry and Internal Trade (DPIIT) registered) **startup in India** — similar to the provision for domestic investors.

Impact on FDI inflow:

- The proposed tax might deter the foreign investors as they may not want to deal with additional tax liability by virtue of their investment in the startup.
- This in turn will affect the FDI flow in India.
- **Creates issues with multiple valuation methods :**
- The proposed tax will also create issues with multiple valuation methods for FEMA (Foreign Exchange Management Act) and tax purposes.
- The Foreign Exchange Management Act (FEMA) 1999 is legislation which regulates the inflow and outflow of foreign exchange.
- It came into force on 1st June 2000.
- **Impact on funding from foreign sources :**
- The recent change came at a time when **funding for India’s startups dropped by 33 per cent to \$24 billion in 2022** as compared to the previous year.
- Foreign investors are a key source of funding for the start-ups and have played a big role in increasing the valuation.
- Tiger Global, one of the most prolific foreign investors in India, has invested in over a third of the start-ups that have turned unicorn, with a valuation of at least \$1 billion.

18. Additional Surveillance Mechanism

Section: Capital Markets

Concept :

- The National Stock Exchange (NSE) placed Adani Enterprises, Adani Ports, and Ambuja Cements under **the additional surveillance mechanism (ASM)**.
- The move comes as shares of Adani group companies continue to fall in the wake of accusations of stock manipulation.

Additional Surveillance Mechanism (ASM)

- The **ASM was introduced in 2018 by SEBI** with the intention to protect investors from market volatility and unusual changes in share price.
- The **shortlisting of securities for placing in ASM** is based on criteria that are jointly **decided by the Securities and Exchange Board of India (SEBI) and exchanges**, covering the parameters of:
 - High low variation,
 - Client concentration,
 - Close-to-close price variation,
 - Market capitalization [Market Cap = Current Share Price * Total Number of Shares Outstanding. For example, a company with 20 million shares selling at \$100 a share would have a market cap of \$2 billion]
 - Volume variation,

- Price-Earnings Ratio, (Read below)
- Delivery percentage, and
- Number of unique PANs.
- Put simply, an **ASM shortlisting signals to investors that the stocks have seen unusual activity.**
- The shortlisting of securities under ASM is **purely on account of market surveillance** and it should not be **construed as an adverse action against the concerned company / entity.**
- Stricter measures are imposed on those stocks **to discourage speculators and intra-day traders from taking heavy positions in stocks.**

Stricter Exchange Rules imposed on ASM stocks:

Percentage price band

- If Stock A enters the surveillance list today (say July 31), it will be moved into a percent price band on August 1. That is, its price can move only 5 percent either way from the previous day's closing level. The stock will be halted from trading for the rest of the day if it breaches the 5 percent limit.
- From the fifth trading day (August 7, in our example), 100 percent margin money will be required to trade Stock A.

Trade-To-Trade Settlement

- A stock in the surveillance list will be moved to a Trade-To-Trade Settlement if its PE ratio shoots above 100. It will be moved out of the list if its PE falls below 10 or below the ratio of Nifty 500 Index.
- **Trade to Trade settlement** is a segment where **shares can be traded only for compulsory delivery basis.**
- It means Trade to Trade shares cannot be traded on intraday. Each share purchased/sold which are parts of this segment need to be taken delivery by paying full amount.
- **Price to Earnings Ratio or Price Earnings Multiple** is the **ratio of share price** of a stock to its **earnings per share (EPS).**
- **PE ratio** is one of the most popular valuation metrics of stocks. It provides an indication of whether a stock at its current market price is expensive or cheap.

19. Products available in the Secondary Market

Context: Adani issue

Concept:

Following are the main financial products/instruments dealt in the secondary market:

Equity: The ownership interest in a company of holders of its common and preferred stock. The various kinds of equity shares are as follows:-

Equity Shares:

An equity share, commonly referred to as ordinary share also represents the form of fractional ownership in which a shareholder, as a fractional owner, undertakes the maximum entrepreneurial risk associated with a business venture. The holders of such shares are members of the company and have voting rights.

- **Rights Issue / Rights Shares:** The issue of new securities to existing shareholders at a ratio to those already held.
- **Bonus Shares:** Shares issued by the companies to their shareholders free of cost by capitalization of accumulated reserves from the profits earned in the earlier years.
- **Preferred Stock / Preference shares:** Owners of these kinds of shares are entitled to a fixed dividend or dividend calculated at a fixed rate to be paid regularly before dividend can be paid in respect of equity share. They also enjoy priority over the equity shareholders in payment of surplus. But in the event of liquidation, their claims rank below the claims of the company's creditors, bondholders / debenture holders.
- **Cumulative Preference Shares:** A type of preference shares on which dividend accumulates if remains unpaid. All arrears of preference dividend have to be paid out before paying dividend on equity shares.
- **Cumulative Convertible Preference Shares:** A type of preference shares where the dividend payable on the same accumulates, if not paid. After a specified date, these shares will be converted into equity capital of the company.
- **Participating Preference Share:** The right of certain preference shareholders to participate in profits after a specified fixed dividend contracted for is paid. Participation right is linked with the quantum of dividend paid on the equity shares over and above a particular specified level.
- **Security Receipts:** Security receipt means a receipt or other security, issued by a securitisation company or reconstruction company to any qualified institutional buyer pursuant to a scheme, evidencing the purchase or acquisition by the holder thereof, of an undivided right, title or interest in the financial asset involved in securitisation.
- **Government securities (G-Secs):** These are sovereign (credit risk-free) coupon bearing instruments which are issued by the Reserve Bank of India on behalf of Government of India, in lieu of the Central Government's market borrowing programme. These securities have a fixed coupon that is paid on specific dates on half-yearly basis. These securities are available in wide range of maturity dates, from short dated (less than one year) to long dated (up to twenty years).

- **Debentures:** Bonds issued by a company bearing a fixed rate of interest usually payable half yearly on specific dates and principal amount repayable on particular date on redemption of the debentures. Debentures are normally secured / charged against the asset of the company in favour of debenture holder.
- **Bond:** A negotiable certificate evidencing indebtedness. It is normally unsecured. A debt security is generally issued by a company, municipality or government agency. A bond investor lends money to the issuer and in exchange, the issuer promises to repay the loan amount on a specified maturity date. The issuer usually pays the bond holder periodic interest payments over the life of the loan. The various types of Bonds are as follows-
 - **Zero Coupon Bond:** Bond issued at a discount and repaid at a face value. No periodic interest is paid. The difference between the issue price and redemption price represents the return to the holder. The buyer of these bonds receives only one payment, at the maturity of the bond.
 - **Convertible Bond:** A bond giving the investor the option to convert the bond into equity at a fixed conversion price.
- **Commercial Paper:** A short term promise to repay a fixed amount that is placed on the market either directly or through a specialized intermediary. It is usually issued by companies with a high credit standing in the form of a promissory note redeemable at par to the holder on maturity and therefore, doesn't require any guarantee. Commercial paper is a money market instrument issued normally for tenure of 90 days.
- **Treasury Bills:** Short-term (up to 91 days) bearer discount security issued by the Government as a means of financing its cash requirements.

20. Green channel

Section: Msc

Concept:

Keeping in view the needs of the market and the best practices in other jurisdictions, the Commission, vide notification dated August 13, 2019, amended Competition Commission of India (Procedure in regard to the transaction of business relating to combinations) Regulations, 2011, and introduced an automatic system of approval for combinations through a '**Green Channel**' route.

Under this process, a combination is deemed to have been approved upon filing the notice in the prescribed format and acknowledgement thereof, subject to Commission's finding that the combination falls under the 'Green Channel' scheme. This system would significantly reduce time and cost of transactions.

The 'Green Channel' is expected to sustain and promote speedy, transparent and accountable review of combination cases, strike a balance between facilitation and enforcement functions and create a culture of compliance and support economic growth.

21. Section 10 (26AAA) of the IT Act 1961

Section: Fiscal Policy

Concept :

- On January 13, the Supreme Court held that the **benefit of tax exemption provided in Section 10 (26AAA) shall be extended to all Sikkimese people.** (Association of Old Settlers of Sikkim vs Union of India)
- **Before this judgment, the tax exemption excluded "old Indian settlers",** who had permanently settled in Sikkim before the merger of the state into the Indian union on April 26, 1975, even if their names were recorded in the register maintained under the Sikkim Subjects Regulations, 1961, read with the Sikkim Subject Rules, 1961 (also referred to as the "Register of Sikkim Subjects").
- Also, the court **struck down the provision (an article or clause that introduces a condition) to Section 10 (26AAA),** which excluded **Sikkimese women who had married non-Sikkimese men** after April 1, 2008, from the benefit of tax exemption, as violative of Articles 14, 15, and 21 of the Constitution.
- The SC verdict extended the **benefit of income-tax exemption beyond the categories of Sikkimese defined in the Explanation to Section 10 (26AAA).**

Section 10 (26AAA)

- This section describes the income that does not form a part of the total income while calculating the tax for an individual, also known as "**exempted income**".
- Under the Explanation to Section 10 (26AAA), the **definition of 'Sikkimese' is confined to**
 - individuals "whose name is recorded in the register maintained under the Sikkim Subjects Regulation, 1961 read with the Sikkim Subject Rules, 1961, immediately before the 26th day of April 1975;
 - the 73,000-odd individuals whose names were included in the Register of Sikkim Subjects by virtue of Government of India Orders of August 1990 and April 1991; and
 - "any individual whose name does not appear in the Register of Sikkim Subjects, but it is established beyond doubt that the name of such individual's father or husband or paternal grandfather or brother from the same father has been recorded in that register".
- Section 10 (26AAA) was inserted into the IT Act, 1961 by the Finance Act, 2008 with retrospective effect from April 1, 1990, the date on which the IT Act was made applicable in Sikkim.

22. Sebi tweaks rules for sharp rating actions, non-cooperating issuers

Concept : Financial markets

- The Securities and Exchange Board of India (Sebi) has tweaked the framework around 'sharp rating actions' and also fine-tuned the policy for dealing with non-cooperating issuers for **credit rating agencies (CRAs)**.
- SEBI tweaked its operational circular on credit rating agencies (CRAs), asking them to have a **detailed policy by March-end in respect of non-submission of crucial information, including quarterly financial numbers, by the issuers.**
- Also, the detailed policy should **contain methodology in respect of assessing the risk** of non-availability of information from the issuers, **including non-cooperative issuers** and the steps to be taken under various scenarios in order to ascertain the status of non-cooperation by the issuer company.
- Further, CRAs will have to follow a **uniform practice of three consecutive months of non-submission of no-default statement (NDS)** as a ground for considering migrating the ratings to **INC (issuers not cooperating)** and need to tag such ratings within 7 days of three consecutive months of non-submission of NDS.

Credit Rating

- A credit rating is an **assessment of the creditworthiness of a borrower** in general terms or with respect to a particular debt or financial obligation.
- A credit rating can be assigned to any entity that seeks to borrow money — an individual, corporation, state or provincial authority, or sovereign government.

What are Credit Rating Agencies?

- A credit rating agency (CRA) is a **company that assigns credit ratings**, which rate a **debtor's ability to pay back debt by making timely principal and interest payments** and the **likelihood of default**.
- Credit rating agencies in India came into existence in the second half of the 1980s.
- In India, **CRAs are regulated by SEBI (Credit Rating Agencies) Regulations, 1999** of the Securities and Exchange Board of India Act, 1992.
- There are a **total of seven credit agencies in India** viz, CRISIL, CARE, ICRA, SMREA, Brickwork Rating, India Rating and Research Pvt. Ltd and Infomerics Valuation and Rating Private Limited.
- CRAs were set up to provide independent evidence and research-based opinion on the ability and willingness of the issuer to meet debt service obligations, quintessentially attaching a probability of default to a specific instrument.
- Evaluating the creditworthiness of an instrument comprises of both qualitative and quantitative assessments, making credit rating far from a straightforward mathematical calculation.

23. Sebi notifies stronger framework for green bonds

Concept :

- Markets regulator Sebi on Friday **strengthened the framework for green bonds by introducing the concept of 'blue' and 'yellow' bonds** as new modes of sustainable finance.
- **Blue bonds** relate to **water management and marine sector**, while **yellow bonds** pertain to **solar energy**.
- These are sub-categories of green debt securities.
- These measures have been taken in the backdrop of increasing interest in sustainable finance in India as well as around the globe, and with a view to align the extant **framework for green debt securities with the updated Green Bond Principles (GBP) recognised by IOSCO.**

Green Bond Principles

- The Green Bond Principles (GBP) seek to support issuers in financing environmentally sound and sustainable projects that foster a net-zero emissions economy and protect the environment.
- GBP-aligned issuance should provide transparent green credentials alongside an investment opportunity.
- The GBP, updated as of June 2021, **are voluntary process guidelines** that recommend transparency and disclosure and promote integrity in the development of the Green Bond market by clarifying the approach for issuance of a Green Bond.

Green Bonds

- A green bond is a **fixed-income instrument designed to support specific climate-related or environmental projects.**
- The phrase "green bond" is sometimes used interchangeably with "**climate bonds**" or "**sustainable bonds.**"
- Green bonds can finance various projects, **most often related to renewable energy (e.g. wind, solar, hydro), recycling, and clean transportation.** More specifically, examples of projects financed with green bonds include: Renewable Energy, Energy Efficiency.
- Green bonds are asset-linked and backed by the issuing entity's balance sheet. They work **just like any other corporate or government bond.**
- They are used to finance projects aimed at sustainable agriculture, pollution prevention, fishery and forestry, clean water and transportation, along with environment friendly water management projects.

Current regulatory framework

- Green bonds are a form of infrastructure financing and the Securities and Exchange Board of India (“SEBI”) had issued a concept paper on the same in 2015.
- Such instruments were **covered within the ambit of general debt securities** and were **regulated by SEBI as such**, along with the related compliances for general debt securities – i.e compliance with provisions of the Companies Act, 2013, mandatory listing as per SEBI regulations, disclosures etc.
- In the 2017 circular, **SEBI proposed a definition of ‘green debt securities’** as part of its regulations.
- A debt security could be considered ‘green’ or a ‘green debt security’ if the funds raised through such issuance were to be utilized for projects/ assets categorized broadly as follows, which **list could be added to / changed by SEBI from time to time**.

24. Banking sector remains stable, resilient says RBI

Section: Monetary Policy and Banking

Concept :

- The Reserve Bank of India (RBI) has said that as a regulator and supervisor, it maintains a constant vigil on the banking sector and on individual banks to maintain financial stability.
- The RBI said, as per its current assessment, the banking sector remains resilient and stable. It added that various parameters relating to capital adequacy, asset quality, liquidity, provision coverage and profitability are healthy.
- The RBI further added that banks are also in **compliance with the Large Exposure Framework guidelines issued by it**.
- The RBI has a **Central Repository of Information on Large Credits database system used for monitoring purposes**, where the banks report their exposure of five crore rupees and above.
- The RBI said it remains vigilant and continues to monitor the stability of the Indian banking sector.

Large Exposure Framework

- In order to address concentration risk and to align with internationally accepted practices, RBI has issued a circular dated December 1, 2016 on “Large Exposure Framework”.
- The **salient features of the Large Exposures (LE) Framework include:**
- The sum of all exposure values of a bank to a counterparty or a group of connected counterparties is defined as a large exposure, if **it is equal to or more than 10 percent of the bank’s eligible capital base**.
- The **LE limit in respect of each counterparty and group of connected counterparties**, under normal circumstances, will be **capped at 20 percent and 25 percent** respectively of the eligible capital base.
- The eligible capital base is defined as the Tier 1 capital of the bank as against ‘Capital Funds’ at present.
- A **group of connected counterparties** is identified on the basis of ‘control’ criteria. Though ‘economic dependence’ criteria had been included in the draft guidelines, the same has been excluded in the final circular based on the feedback and our assessment that ‘economic dependence’ criteria may be very difficult to implement in the Indian context.
- **Banks’ exposure to Government, Reserve Bank, clearing related exposures to QCCP are excluded**, at present.
- While the draft provided exemptions for interbank bank exposures from LE Framework, based on the Basel’s latest updates, we have included the interbank exposures in the LE Framework i.e., interbank exposures will be subject to LE limits and reporting.
- The **LE framework will be fully applicable with effect from April 1, 2019**.

Central Repository of Information on Large Credits (CRILC)

- **Central Repository of Information on Large Credits (CRILC)** is set up by RBI to collect, store, and disseminate credit data to lenders.
- Hence, banks will have to furnish credit information to CRILC on all their borrowers having aggregate fund-based and non-fund based **exposure of Rs.5 crores and above**.
- Similarly, banks are required to report, among others, the SMA (Special Mention Accounts) status of the borrower to the CRILC.
- All the financial institutions under the RBI have to separately report to CRILC.

25. Goldilocks Balance

Concept :

- Goldilocks rate/balance are characterized by an economy which is neither **too heated (inflationary) nor in recessionary state**. i.e. the currency is not too strong or weak in global markets.
- It means that economy is in **stable state with steady growth rates, low interest rates, low unemployment**.
- The Goldilock State of economy is said to be **ideal for investing** as interest rates are lower and if steadily growth is witnessed, bonds and stocks would hold their value in long term and hence provide good returns.
- However, too fast pace of growth could lead to inflationary situation and affect investors adversely.
- Goldilocks economies are **temporary in nature, as seen by the boom and bust cycles**.

26. IBC boosted 'ease of doing business' rank

Section : Msc

Ease of Doing Business:

- The **Doing Business Report** is the flagship publication of the **World Bank** Group that benchmarks business regulations in 191 economies.
 - The Doing Business Report measures regulations that enhance business activity and those that constrain it.
- The **Ease of Doing Business (EoDB) index is a ranking system established by the World Bank** Group wherein the 'higher rankings' (a lower numerical value) indicate better, usually simpler, regulations for businesses and stronger protections of property rights.
- The Ease of doing business ranking is **an indication of an economy's position** relative to that of other economies.
- **In India, these indicators relate to business regulations for small and medium sized firms located in Delhi and Mumbai** based on standardized case scenarios.
- The indicators are from 11 areas of business regulation such as: **Starting a Business, Dealing with Construction Permits, Getting Electricity, Registering Property, Getting Credit, Protecting Minority Investors, Paying Taxes, Trading across Borders, Enforcing Contracts, and Resolving Insolvency.**

IBC

- It is a reform enacted in 2016. It **amalgamates various laws relating to the insolvency** resolution of business firms.
- It lays down **clear-cut and faster insolvency proceedings to help creditors**, such as banks, recover dues and prevent bad loans, a key drag on the economy.
- **Insolvency and Bankruptcy Code (IBC) 2016** was implemented through an act of Parliament. It got Presidential assent in May 2016.
- Centre introduced the IBC in 2016 to resolve **claims involving insolvent companies.**
- The bankruptcy code is a one stop solution for resolving insolvencies, which previously was a long process that did not offer an economically viable arrangement. The code aims to protect the interests of small investors and make the process of doing business less cumbersome. The IBC has 255 sections and 11 Schedules.
- IBC was intended to tackle the bad loan problems that were affecting the banking system.
- The IBC process has changed the debtor-creditor relationship. A number of major cases have been resolved in two years, while some others are in advanced stages of resolution.
- It provides for a time-bound process to resolve insolvency. When a default in repayment occurs, creditors gain control over debtor's assets and must take decisions to resolve insolvency. Under IBC, debtor and creditor both can start 'recovery' proceedings against each other.
- Companies have to complete the entire insolvency exercise within 180 days under IBC. The deadline may be extended if the creditors do not raise objections on the extension. For smaller companies, including startups with an annual turnover of Rs 1 crore, the whole exercise of insolvency must be completed in 90 days and the deadline can be extended by 45 days. If debt resolution doesn't happen the company goes for liquidation.

- **Insolvency:** It is a situation where individuals or companies are unable to repay their outstanding debt.
- **Bankruptcy:** It is a situation whereby a court of competent jurisdiction has declared a person or other entity insolvent, having passed appropriate orders to resolve it and protect the rights of the creditors. It is a legal declaration of one's inability to

- Under IBC, either the creditor (banks) or the loaner (defaulter) can initiate insolvency proceedings.
- It is done by submitting a plea to the **adjudicating authority, the National Companies Law Tribunal (NCLT).**
- According to IBC, a financial creditor holds an important role in the corporate insolvency process.
- The **Committee of Creditors (CoC)** under IBC includes all financial creditors of a corporate debtor.
- The CoC will appoint and supervise the **Insolvency Professional.**
- It has the power to either approve or reject the resolution plan to revive the debtor, or to proceed to liquidate the debtor.

27. SEBI gets strict on beneficial owners hiding behind FPIs

Concept :

- Market regulator SEBI is now going behind the corporate veil of the foreign portfolio investors in the aftermath of the allegations that have emerged against Adani Group.
- In India, it has been noticed that in a large number of cases, the **foreign portfolio investors (FPIs)** are just the registered vehicles, but the **ultimate beneficial owners (UBOs)** of their positions are hidden.

- The Securities and Exchange Board of India (Sebi) has asked **Designated Depository Participants (DDPs) operating within Indian banks to update the beneficial ownership details** of the foreign portfolio investors on-boarded as their clients within September 30.

Background

- Besides levelling charges of brazen stock manipulation and accounting frauds, the Hindenburg report stated that **many of the funds investing in the listed Adani companies' universe have concealed their ultimate beneficial ownership** with nominee directors.

Beneficial ownership

- A beneficial owner is a person who **enjoys the benefits of ownership** though the property's title is in another name.
- Publicly traded securities are often registered in the name of a broker for safety and convenience.
- Wealthy individuals often list their assets under trust while they remain the beneficial owner.
- Beneficial ownership is **distinguished from legal ownership**.
- In most cases, the legal and beneficial owners are one and the same, but there are some cases, legitimate and sometimes less legitimate, where the beneficial owner of a property may wish to remain anonymous.
- When a corporation or other legal entity opens a bank account, the bank must identify the beneficial owners of that entity. This is intended to prevent money laundering and tax evasion.

Foreign Portfolio Investors

- Foreign portfolio investment (FPI) consists of **securities and other financial assets passively held by foreign investors**.
- It does not provide the investor with direct ownership of financial assets and is relatively liquid depending on the volatility of the market.
- **Examples of FPIs** include stocks, bonds, mutual funds, exchange traded funds, American Depositary Receipts (ADRs), and Global Depositary Receipts (GDRs).
- FPI is part of a country's capital account and is shown on its Balance of Payments (BOP).
- The BOP measures the amount of money flowing from one country to other countries over one monetary year.
- **FPI is often referred to as "hot money"** because of its tendency to flee at the first signs of trouble in an economy. FPI is more liquid, volatile and therefore riskier than FDI.

28. Pledging of shares

Concept :

- A pledge of stock or share pledge means **using shares as collateral and taking a loan against them**.
- Shares are basically the assets of the company or a shareholder.
- Pledging is a way by which the promoters **of any company take a loan against the held shares to meet these personal or business requirements** including fulfillment of capital requirements, expansion of business, starting a new venture, and so on.

Why do promoters pledge shares?

- One of the methods promoters use to raise finance is to take loans against their holding in their company from banks or non-banking financial companies.
- For these financial institutions, these shares are collateral.
- Promoters can raise funds for various reasons-for meeting requirements of the business or personal needs.

Can lenders sell the shares pledged by promoters?

- Banks/lenders can sell the pledged share if the price of the stock falls closer to the value agreed in the contract between them and the company.
- Typically, the amount that is lent by banks/NBFCs to promoters is less than the market value of the shares.
- This **shortfall is the margin is the amount that these lenders retain as security**.
- In case the stock price falls, **lenders ask the promoter to provide more cash or shares to top up this margin**.
- If the **promoters are not able to top up the collateral, the lenders can sell the shares to maintain this margin**. Conversely, revoking of pledged shares by promoters is seen as a positive sign.

What is the risk for retail investors in this?

- High promoter pledged shares can wreak havoc in stock if price continues to fall and lenders sell these shares in the market.
- The sudden supply of shares can lead to further price fall and is a risk for retail investors who may have to sell the shares for a significant loss.
- Shares of companies with high pledged promoter holding tend to witness higher volatility.
- The risk is assessed on the basis of the amount of pledged shares as a percentage of the total shareholding.
- A stock is considered a risky bet if pledged shares are more than 50% of the total shares in the company so ideally, retail investors should avoid such stocks.

29. The status and proceeds of disinvestment

Section : Fiscal Policy

Concept :

- In the Union Budget for 2023-24, the government has set a disinvestment **target of ₹51,000 crore**, down nearly 21% from the budget estimate for the current year.
- It is also the lowest target in seven years.

Background

- The Centre has **not met the disinvestment target for 2022-23 so far**, having realised ₹31,106 crore to date.
- According to the recently release **Economic Survey report**, **about ₹4.07 lakh crore has been realised as disinvestment proceeds in the past nine years**.
- Post-2014 the government is engaging with the private sector as a co-partner in the development.
- So far, different central governments over the last three decades have been able to meet annual disinvestment targets only six times.

Disinvestment

- Disinvestment or divestment refers to the selling of the assets or a subsidiary such as a Central or State public sector enterprise by the government.

There are three key approaches to disinvestment which include:

- **Minority disinvestment:** The government despite restoring to disinvestment still retains majority shares in the company usually greater than 51%.
- With respect to minority disinvestment, the government still holds management control.
- **Majority disinvestment:** In the case of majority disinvestment, the government transfers the control to the acquiring entity and retains only some stake.
- **Complete privatisation:** With respect to complete privatisation, 100% of the control of a public entity is transferred to the acquiring entity.
- The **Department of Investment and Public Asset Management (DIPAM)** is a separate department working under the Union Finance Ministry which looks after disinvestment-related procedures.

Evolution of Disinvestment in India

- Disinvestment in India began in 1991-92 when 31 selected PSUs were disinvested for Rs. 3,038 crores.
- The term '**disinvestment**' was **used first time in Interim Budget 1991**.
- Later, Rangarajan committee, in 1993, emphasised the need for substantial disinvestment.
- The policy on disinvestment gathered steam, when a new **Department of Disinvestment was created in 1999, which became a full Ministry in 2001**.
- But in 2004, the ministry was shut down and was **merged in the Finance ministry as an independent department**.
- Later, the Department of Disinvestments was renamed as **Department of Investments and Public Asset Management (DIPAM) in 2016**.
- Now, **DIPAM acts as a nodal department for disinvestment**.

Current Disinvestment Policy

- The new policy clearly highlights the distinction between **privatization and disinvestment**.
- While **sales of equity greater than 50%, maybe even 100%, is privatization, any tinkering here and there constitutes disinvestment**.
- Previous efforts at large scale sale of shares have been frequently mired in controversies and as a result, bureaucrats have developed a sort of an aversion to strategic sales.
- In a course correction, the **new disinvestment policy provides for land to be valued at market price for inclusion in sales**. This will help prevent any scope for rent-seeking and reduces discretionary powers and thus enables bureaucrats to do away with the status quo.
- **NITI Aayog has been entrusted** to come up with **new recommendations about loss-making units that can be sold**, their assets valued and disposed of, and to carry out possible strategic sales.
- Financial parameters of public sector companies, such as borrowings and operating profits, are being closely monitored to identify possibilities of share buybacks, a new kind of disinvestment the government has recently come up with.

What are CPSEs likely to be divested in 2023-24?

- According to DIPAM, the government has decided to stick to the already-announced and planned privatisation of State-owned companies.
- These include IDBI Bank, the Shipping Corporation of India (SCI), the Container Corporation of India Ltd (Concor), NMDC Steel Ltd, BEML, HLL Lifecare, and so on.

- The disinvestments of Bharat Petroleum Corporation Limited, SCI, and ConCor had been approved by the government in 2019 but have not gone through yet.

30. RBI hikes Repo rate by 25 bps

Section: Monetary Policy

Concept:

- In its first Monetary Policy statement of 2023, the RBI hiked the **policy repo rate by 25 basis points to 6.5%**.
- Repo rate is the rate at which the RBI lends money to banks to meet their short-term funding needs.
- The decision to raise the repo rate was **approved by a 4: 2 majority by the central bank's Monetary Policy Committee (MPC)**.
- **The hike so far :**
- The RBI has increased the repo rate by a cumulative 250 basis points to 6.50 per cent since May 2022.
- Present hike was the sixth straight hike to the repo rate, which, in December 2022, was raised by 35 basis points to 6.25%.
- **Inflation forecast:**
- The central bank has lowered the inflation target for FY23 from 6.7 per cent to 6.5 per cent – which is still above the RBI's comfort level of four percent. Inflation is expected to be 5.3 percent in FY24.
- Inflation for Q4 of FY23 at 5.7 percent as against 5.9 percent.

Monetary Policy Committee

- The **Monetary Policy Committee (MPC)** is a committee of the RBI, which is entrusted with the **task of fixing the benchmark policy interest rate (repo rate)** to contain **inflation within the specified target level**.
- The **RBI Act, 1934 was amended by Finance Act (India), 2016 to constitute MPC** to bring more transparency and accountability in fixing India's Monetary Policy.
- The amended RBI Act also **provides for the inflation target to be set by the Government of India, in consultation with the Reserve Bank, once in every five years**.
- The policy is published **after every meeting with each member explaining his opinions**.
- The committee is **answerable to the Government of India** if the inflation exceeds the range prescribed for three consecutive months.
- Suggestions for setting up a Monetary policy committee is not new and goes back to 2002 when YV Reddy committee proposed to establish an MPC, then Tarapore committee in 2006, Percy Mistry committee in 2007, Raghuram Rajan committee in 2009 and then Urjit Patel Committee in 2013.

Composition and Working

- The committee comprises six members – three officials of the RBI and three external members nominated by the Government of India.
- The meetings of the Monetary Policy Committee are held at least 4 times a year and it publishes its decisions after each such meeting.
- **The Governor of RBI is the chairperson ex officio of the committee.**
- Decisions are **taken by a majority with the Governor having the casting vote** in case of a tie.
- They need to observe a “silent period” seven days before and after the rate decision for “utmost confidentiality”.

Instruments of monetary policy are of two types:

- **Quantitative Instruments:** General or indirect (Cash Reserve Ratio, Statutory Liquidity Ratio, Open Market Operations, Bank Rate, Repo Rate, Reverse Repo Rate, Marginal standing facility and Liquidity Adjustment Facility (LAF))
- **Qualitative Instruments:** Selective or direct (change in the margin money, direct action, moral suasion).

31. Without considering green GDP, the budget's claim of green growth is weak

Section: National Income

Context: While “green growth” is highlighted in the annual budget, experts note that there is a need to also factor in “green GDP” which is the basis of this growth.

- Green GDP is a term used for **expressing GDP after adjusting for environment degradations**.
- Green GDP accounts for **estimates of environmental degradation, depletion of natural resources**, and savings of resources and environment into the national income accounts.
- There is **no consensus over methodology** for calculating green GDP worldwide, the RBI paper researchers have admitted. They claim that they have **used the most comprehensive methodology of Green GDP estimation** which includes environmental pollution cost, resource depletion cost, and savings of resources and the environment. They have used the following formula:
 - **Green GDP = GDP – (Carbon dioxide damage + particulate emission damage) – (Opportunity cost of energy depletion + mineral depletion + net forest depletion) + Expenditure on environmental protection.**
- The concept was **first initiated through a System of National Accounts**.

- The System of National Accounts (SNA) is an accounting framework for measuring the economic activities of production, consumption and accumulation of wealth in an economy during a period of time. When information on economy's use of the natural environment is integrated into the system of national accounts, **it becomes green national accounts or environmental accounting.**
- The process of environmental accounting **involves three steps Physical accounting; monetary valuation; and integration with national Income/wealth Accounts.**
 - **Physical accounting** determines the state of the resources, types, and extent (qualitative and quantitative) in spatial and temporal terms.
 - **Monetary valuation** is done to determine its tangible and intangible components.
 - Thereafter, the **net change in natural resources** in monetary terms is integrated into the Gross Domestic Product in order to reach the value of Green GDP.
- It reflects the **deep need and commitment from the country internalising the values** of its ecosystem and ecosystem services into mainstream accounting.

32. Free float in stocks

Section: Financial Market

Concept :

- Recently, index provider MSCI said it has cut the free-float designations of four securities of India's Adani group.

About Free Float:

- The **free float** is also known as **Public float** which refers to the **shares of a company that can be publicly traded and are not restricted.**
- It generally **excludes promoters' holding, government / strategic holding and other locked-in shares**, which will not come to the market for trading in the normal course.
- **Free Float**=(Outstanding shares-Restricted Shares-Closely held shares)
- **Outstanding shares** refer to the number of shares held by all of the company's shareholders
- **Restricted shares** refer to shares that are not transferable until certain conditions are met. Restricted shares are generally held by corporate management, such as executives and directors.
- **Closely-held shares** refer to shares that are typically held onto for a very long-term basis. Examples include major long-term shareholders and insiders.
- **Free Float Methodology** is used to provide a **more accurate reflection of market movements and stocks actively available** for trading in the market.
- The free-float methodology has been adopted by many of the world's major indexes.

MSCI Index

- MSCI is an acronym for **Morgan Stanley Capital International.**
- It is an investment research firm that **provides stock indexes, portfolio risk and performance analytics, and governance tools** to institutional investors and hedge funds.
- **MSCI calculates free float-adjusted market capitalization for each security** to calculate the weights of the securities in the MSCI indexes.
- It is calculated by **multiplying an equity's share price to number of shares available in the market.**
- Rather than using all of the shares (both active and inactive), the free float method excludes the locked in shares.
- The MSCI India Index is designed to measure the performance of the large and midcap segments of the Indian market.
- With 96 constituents, the index covers approximately 85% of the Indian equity universe. The MSCI India Index was launched on Apr 30, 1993.

33. Bear cartel hand seen in \$100b rout in Adani shares

Section :Money Market

Concept :

- An initial probe by market regulator SEBI and government agencies suggests that a **bear cartel** may have triggered the \$100billion rout in the share price of Adani Group companies through the use of highly potent **structured product derivatives (SPDs)**, tailor made by foreign banks for high networth traders and funds.
- **SPDs, like Participatory Notes**, keep the identity of the ultimate beneficiary hidden.
- By India's tax and SEBI laws, **short selling of domestic stocks outside India is illegal.**
- But the probe reveals huge trading in Adani stocks outside the country that had a domino effect on domestic markets as the volatility increased.

Bear cartel

- In the stock market, bears are those who identify problematic companies and short-sell them.
- **Short selling** means that **traders sell the shares of a particular company without owning them.**

- They can do this by borrowing shares from other shareholders or by going short in the futures market.
- To create maximum impact on the share prices, the **traders create a group termed as a bear cartel.**
- Since the bears attack a particular stock or group of stocks in order to gain from the fall in price, the action is performed normally in times of stress and bad market conditions.

Structured product

- A **structured product is essentially a customised financial instrument** that utilizes various investment avenues and combines them in a package.
- Structured products or market-linked debentures are products where majority of the money is invested in fixed-income securities and the smaller portion in derivatives linked to a assets such as equities.
- The risk factors and the return objectives of structured products are not fixed and **can vary per the needs of the investor.**
- Structured products **utilise traditional underlying assets, but the returns from the underlying assets are swapped with derivatives.**
- Structured products include bonds, equities, and derivatives as the principal assets.
- **Bonds and equities together generate returns and derivatives act as the determinant of the overall risk involved in a structured product.**
- Derivatives help customise the returns from the underlying assets to meet the unique requirements of the investors.
- Usually, structured products combine different asset classes to create a mixed investment portfolio. A structured product balances the risks it undertakes by including secure investments as part of the portfolio.
- In India, the **minimum value of a structured product investment is INR 10 lakhs.**

Participatory notes

- Participatory notes (P-notes) are issued by registered **foreign portfolio investors (FPIs) to overseas investors** who wish to be a part of the Indian stock market **without registering themselves under SEBI directly** after going through a due diligence process.
- The increase in P-notes investment is in line with the higher net inflows of Foreign Portfolio Investors (FPIs) in the cash segment.
- P-Notes are **Offshore Derivative Investments (ODIs) with equity shares or debt securities as underlying assets**, as they are used by the investors abroad but not within India.
- They provide liquidity to the investors as they can transfer the ownership by endorsement and delivery.
- While the **FPIs have to report all such investments each quarter to SEBI, they need not disclose the identity of the actual investors.**

34. India notifies to WTO its quality control plans for 12 protective textile items

Section : External Sector

Concept :

- India has notified to the WTO of its intention to come up with a **quality control order (QCO) for 12 items made of protective textile** including protective clothing and gloves, bullet resistance jackets, high-visibility warning clothes and water-proof multi-purpose rain ponchos.
- The **QCO, which makes Bureau of Indian Standards (BIS) certification mandatory for sale of the identified items in the domestic market**, is aimed at ensuring health and safety of consumers but also plays an important role in curbing cheap imports.
- The final date for comments (from WTO members) is 60 days from the date of notification as per the notification made to the **Committee on Technical Barriers to Trade of the WTO.**

Committee on Technical Barriers to Trade (TBT) of the WTO

- WTO members/observers use the **TBT Committee to discuss specific trade concerns (STCs)** — specific laws, regulations or procedures that affect their trade, usually in response to notifications.
- Committee develops a series of decisions and recommendations intended to facilitate implementation of the TBT Agreement.
- The Committee **usually holds three formal meetings per year.** These are sometimes preceded by workshops or thematic sessions.
- Meetings are open to all WTO members and observer governments.

Technical Barriers to Trade (TBT) Agreement

- **The TBT Agreement was negotiated during the Uruguay Round of Multilateral Trade Negotiations, which was concluded in 1994**
- The **Technical Barriers to Trade (TBT) Agreement** aims to ensure that technical regulations, standards, and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade.

- The TBT establishes rules and procedures regarding the development, adoption, and application of voluntary product standards, mandatory technical regulations, and the procedures (such as testing or certification) used to determine whether a particular product meets such standards or regulations.
- The Agreement seeks to prohibit the use of technical requirements as needless barriers to trade.
- At the same time, it recognises WTO members' right to implement measures to achieve legitimate policy objectives, such as the protection of human health and safety, or protection of the environment.
- Although it applies to a broad range of agricultural and industrial products, sanitary and phytosanitary (SPS) measures and specifications for government procurement are covered under separate agreements.

35. Industrial output rise moderates to 4.3 % – IIP

Section :National Income

Concept :

- **India's industrial production growth slipped to 4.3 per cent in December from 7.3 per cent in November 2022**, mainly due to subdued performance of the manufacturing sector, according to official data.
- However, there was **improvement on an annual basis** as the factory output growth measured in **terms of the Index of Industrial Production (IIP)** stood at 1 per cent in December 2021.

Index of Industrial Production (IIP)

- The Index of Industrial Production (IIP) is an index that shows the growth rates in different industry groups of the economy in a fixed period of time.
- It is **compiled and published monthly by National Statistical Office (NSO), Ministry of Statistics and Programme Implementation.**
- IIP is a composite indicator that measures the growth rate of industry groups classified under:
- **Broad sectors:** Mining, Manufacturing, and Electricity.
- **Use-based sectors:** Basic Goods, Capital Goods, and Intermediate Goods.
- Base Year for IIP is **2011-2012.**

About Eight Core Sectors:

- These comprise **27% of the weight of items included in the Index of Industrial Production (IIP).**
- The eight core sector industries in decreasing order of their weightage: **Refinery Products> Electricity> Steel> Coal> Crude Oil> Natural Gas> Cement> Fertilizers.**

Significance of IIP:

- IIP is the only measure on the **physical volume of production.**
- It is used by government agencies including the Ministry of Finance, the Reserve Bank of India, etc, for policy-making purposes.
- IIP remains **extremely relevant for the calculation of the quarterly and advance GDP estimates.**
- 14 private member's bills — five of which were introduced in Rajya Sabha — have become law so far.

36. Investor Education and Protection Fund – SEBI

Section: Capital Market

Concept :

- Investor Education and Protection Fund (IEPF) has been established under the Securities and Exchange Board of India Act, 1992.
- The amounts such as **contribution made by SEBI, grants and donations given to the Fund by the Central Government, State Government** or any other entity approved for **the purpose, etc are required to be transferred to the IEPF.**
- The Fund shall be utilised for the **purpose of protection of investors and promotion of investor education and awareness in accordance with SEBI regulations.**
- The Fund is also utilised for distribution of money in cases where SEBI deems fit to make restitution to eligible and identifiable investors who have suffered losses resulting from violation of securities laws, be utilised only for the purposes of such restitution.

Advisory Committee of the fund

- SEBI shall constitute an advisory committee for recommending investor education and protection activities that may be undertaken directly by SEBI or through any other agency, for utilisation of the Fund.
- The Committee shall consider investor education and protection activities keeping in view the purposes and submit its recommendations thereon to SEBI.

37. Direct tax collection

Section: Fiscal Policy

Context: Gross Direct tax collections grew 24 per cent to Rs 15.67 lakh crore so far, this fiscal, the finance ministry said on Saturday

Types of Direct tax in India

Income Tax:

- Income tax is perhaps the most well known direct tax imposed by the government on annual income generated by businesses and individuals.
- Income tax is calculated as per the provisions of Income Tax Act, 1961 and is directly paid to the central government on an annual basis.
- Income does not only mean money earned in the form of salary. It also includes income from house property, profits from business, gains from profession (such as bonus), capital gains income, and 'income from other sources'.
- Income tax is levied on the income of individuals, Hindu undivided families (HUF), unregistered firms and other associations of people.

Corporate Tax

-At present, companies having gross turnover up to Rs.250 crore are liable to pay corporate tax at 25% of the net profit while companies with a gross turnover of more than Rs.250 crore are liable to pay the corporate tax at 30%.

Minimum Alternative Tax (MAT)

MAT is imposed on "zero tax companies", which typically refer to companies that declare little or no income in order to save tax.

Fringe Benefits Tax (FBT)

The FBT tax is imposed on the fringe benefits like drivers and maids provided/paid for by companies to their employees.

Dividend Distribution Tax (DDT)

An amount that is declared, distributed or paid as dividend to the shareholders by a domestic company is taxed under the Dividend Distribution Tax. It is applicable to domestic companies only. Foreign companies distributing dividends in India do not pay this tax (such dividends are taxable in the hands of the shareholder).

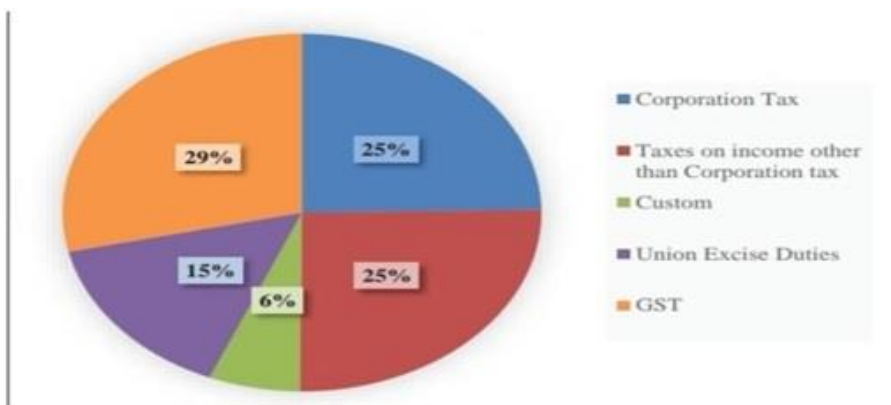
Securities Transaction Tax (STT)

The SST is imposed on the income which the companies get through taxable securities transactions. This tax is free of any surcharge.

Capital Gains Tax

The capital gains tax is imposed on the income derived from the sale of investments or assets. On the basis of the holding period, capital tax is categorized under short-term gains and long-term gains.

Composition of taxes in Gross tax revenue



Source: Union Budget Documents

Tax buoyancy explains this relationship between the changes in the government's tax revenue growth and the changes in GDP. It refers to the responsiveness of tax revenue growth to changes in GDP. When a tax is buoyant, its revenue increases without increasing the tax rate.

A tax is considered buoyant if it is above 1. The tax buoyancy came in at about 2, which means the rate of growth in tax collection was around twice as fast as nominal GDP growth.

Determining factors:

- size of the tax base
- friendliness of the tax administration

- reasonableness and simplicity of the tax rates
- lesser the tax rebates and reductions



38. RBI to allow all inbound travellers to use Unified Payments Interface (UPI)

Section : Monetary Policy

Context: The Reserve Bank of India has said that it will allow all inbound travellers to use Unified Payments Interface (UPI) payments for their merchant payments while they are in the country. The facility will be first introduced for travellers from G20 countries arriving at select international airports

Concept:

- NPCI asked the UPI ecosystem to allow users from some countries with non-resident account types like non-resident external (NRE) and non-resident ordinary (NRO) accounts with international mobile numbers to transact through UPI.
- With this, now Indians staying abroad can make payments through UPI even with having a domestic mobile connection.
- The central bank is proposing to allow all inbound travelers to India to use UPI for merchant payments during their stay in the country.
- The initiative will initially be rolled out for travellers from G20 countries at selected international airports
- This announcement is in-line with the steps undertaken by NPCI to take UPI global, including the extension of UPI on-boarding and transaction facility to Non-Resident account types like NRE/NRO.

Advantages of this facility:

- Allows easier and more convenient for international travellers to make payments
- It provide travellers with a secure and seamless payment experience,
- It boost the growth of the digital payments ecosystem in India,
- It strengthen India's position as the payments leader in the global market
- extension of UPI services to citizens of G20 countries will foster India's relationship with these nations for future collaborations
- Travellers from G20 nations will be able to make merchant payments via UPI with the help of their international mobile numbers.
- Both travellers and merchants will benefit due to an advanced digital payments acceptance ecosystem being set up by the Government
- Under this facility, foreign currency will be deducted from the user's bank account, which is similar to international debit card transactions

39. National financial information registry

Concept :

- National Financial Information Registry is aimed at expediting loan sanctions and credit flows by offering lenders a '360 degree' perspective on potential borrowers, Reserve Bank of India (RBI) Governor Shaktikanta Das said.

National Financial Information Registry

- Finance Minister Nirmala Sithraman in her Budget 2023 speech announced that the government will set up a **National Financial Information Registry to serve as a central repository of financial and ancillary information.**
- This will facilitate efficient flow of credit and lending, promote financial inclusion, and foster financial stability.
- Lot of information is required by a bank, before a loan is sanctioned.
- The idea is to **create one registry where**, it can provide a **360 degree kind of information system** which will be **readily available to the lending institutions** to ensure that it quickens the process of credit flow.
- The RBI has already prepared the draft bill, which is currently being deliberated upon in a post-budget interaction.
- The objective is to build a public infrastructure for credit-related information and right information can be made available by the NFIR to lending agencies.

40. Repo rate may remain at 6.5% for rest of CY23: ICICI Securities

Section: Monetary Policy

Repo and Reverse Repo Rate:

- Repo rate is the rate at which the central bank of a country (Reserve Bank of India in case of India) lends money to commercial banks in the event of any shortfall of funds. Here, the central bank purchases the security.
- Reverse repo rate is the rate at which the RBI borrows money from commercial banks within the country.

Liquidity Adjustment Facility (LAF):

- It is a tool used in monetary policy by the RBI that allows banks to borrow money through repurchase agreements (repos) or for banks to make loans to the RBI through reverse repo agreements.

Monetary Policy Committee

- The Monetary Policy Committee is a statutory and institutionalized framework under the Reserve Bank of India Act, 1934, for maintaining price stability, while keeping in mind the objective of growth.
- An RBI-appointed committee led by the then deputy governor Urjit Patel in 2014 recommended the establishment of the Monetary Policy Committee.
- The Governor of RBI is ex-officio Chairman of the committee.
- The committee comprises six members (including the Chairman) – three officials of the RBI and three external members nominated by the Government of India.
- Decisions are taken by majority with the Governor having the casting vote in case of a tie.
- The MPC determines the policy interest rate (repo rate) required to achieve the inflation target (4%).

41. Insurance Dekho raises \$150 m in Series A Funding from Goldman Sachs, TVS Capital funds

Section: Capital Market

Context:

The large majority of successful startups have engaged in many efforts to raise capital through rounds of external funding. These funding rounds provide outside investors the opportunity to invest cash in a growing company in exchange for equity, or partial ownership of that company.

Series A, B and C funding rounds are merely stepping stones in the process of turning an ingenious idea into a revolutionary global company, ripe for an IPO.

Concept:

Series A Funding

- Once a business has developed a track record (an established user base, consistent revenue figures, or some other key performance indicator), that company may **opt for Series A** funding in order to further optimize its user base and product offerings.
- In this round, it's important to have a plan for developing a business model that will generate long-term profit.
- Series A rounds raise approximately \$2 million to \$15 million
- Investors are looking for companies with great ideas as well as a strong strategy for turning that idea into a successful, money-making business. The investors involved in the Series A round come from more traditional venture capital firms.
- It's also common for investors to take part in a somewhat more political process. It's common for a few venture capital firms to lead the pack. In fact, a single investor may serve as an "anchor." Once a company has secured a first investor, it may find that it's easier to attract additional investors as well.
- **Angel investors also invest at this stage**, but they tend to have much less influence in this funding round than they did in the seed funding stage.

Series B Funding

- Series B rounds are all about taking businesses to the **next level**, past the development stage.
- Investors help start-ups get there by expanding market reach. Companies that have gone through seed and Series A funding rounds have already developed substantial user bases and have proven to investors that they are prepared for success on a larger scale.
- It is used in bulking up on business development, sales, advertising, tech, support, and employees costs a firm a few pennies.
- The average estimated capital raised in a Series B round is \$33 million
- Series B appears similar to Series A in terms of the processes and key players.
- The difference with Series B is the addition of a new wave of other venture capital firms that specialize in later-stage investing.

Series C Funding

- Businesses that make it to Series C funding sessions are already **quite successful**.
- These companies look for additional funding in order to help them develop new products, expand into new markets, or even to acquire other companies.
- In Series C rounds, investors inject capital into the meat of successful businesses, in an effort to receive more than double that amount back. Series C funding is focused on scaling the company, growing as quickly and as successfully as possible.
- **Series C funding could be used to buy another company.**
- In Series C, groups such as hedge funds, investment banks, private equity firms, and large secondary market groups accompany the type of investors mentioned above.
- Companies that do continue with Series D funding tend to either do so because they are in search of a final push before an IPO or, alternatively, because they have not yet been able to achieve the goals they set out to accomplish during Series C funding.

42. QR code-based Coin Vending Machine (OCVM)

Section : Monetary Policy

Concept:

- The apex bank finalized its decision of launching the machine during its recently held MPC meeting. The QR code is being introduced as fake currency notes are increasing in coin vending machines.
- These machines will use **UPI-based code systems to provide coins. Earlier the machines tendered the bank notes physically.**
- **QR code-based coin vending machine**
- Here the **consumer need not use currency notes**. Rather he **shall use his bank account password or a pin to get coins**.
- As he enters the pin or password, the vending machine verifies with his bank account and issues coins from his bank account directly.
- Earlier, the consumer had to drop in currency notes to get coins.

Need for the machine

- To increase the accessibility of coins in the country and also to increase the distribution of coins in the country
- To address the issue: The supply of coins in the country is very high, but distribution is not even.

Where will the new vending machines be available?

- These new coin vending machines are to be **placed in 19 locations across 12 cities**.
- They are to be placed in shopping malls, railway stations, and in other public places where people can access them easily.

43. State Bank of India has upped its benchmark lending rates by 1025 basis points, following the 25-bps increase in the policy repo rate

Section: Monetary Policy

Concept:

- MCLR, was instituted by the RBI with effect from April 1, 2016
- The marginal cost of funds-based lending rate (MCLR) refers **to the minimum interest rate of a bank below which it cannot lend, except in some cases allowed by the RBI.**
- It is an **internal benchmark** or reference rate for the bank. MCLR actually describes the method by which the minimum interest rate for loans is determined by a bank – on the basis of marginal cost or the additional or incremental cost of arranging one more rupee to the prospective borrower.
- It is applicable to fresh corporate loans and floating rate loans taken before October 2019

Reasons for introducing MCLR

RBI decided to shift from base rate to MCLR because the rates based on marginal cost of funds are more sensitive to changes in the policy rates. This is very essential for the effective implementation of monetary policy. Prior to MCLR system, different banks were following different methodology for calculation of base rate /minimum rate – that is either on the basis of average cost of funds or marginal cost of funds or blended cost of funds. Thus, MCLR aims

- To improve the transmission of policy rates into the lending rates of banks.
- To bring transparency in the methodology followed by banks for determining interest rates on advances.
- To ensure availability of bank credit at interest rates which are fair to borrowers as well as banks.
- To enable banks to become more competitive and enhance their long run value and contribution to economic growth.

Calculation of MCLR

The MCLR is a tenor linked internal benchmark (tenor means the amount of time left for the repayment of a loan). The actual lending rates are determined by adding the components of spread to the MCLR. Banks will review and publish their MCLR of different maturities, every month, on a pre-announced date.

The MCLR comprises of the following:

a) **Marginal cost of funds** which is a novel concept under the MCLR methodology comprises of Marginal cost of borrowings and return on net worth, appropriately weighed.

i.e.,

Marginal cost of funds = (92% x Marginal cost of borrowings) + (8% x Return on net worth)

Thus, marginal cost of borrowings has a weightage of 92% while return on net worth has 8% weightage in the marginal cost of funds. Here, the weight given to return on net worth is set equivalent to the 8% of risk weighted assets prescribed as Tier I capital for the bank. The marginal cost of borrowing refers to the average rates at which deposits of a similar maturity were raised in the specified period preceding the date of review, weighed by their outstanding balance in the bank's books.

i.e.,

Rates offered on deposits of a similar maturity on the date of review/ rates at which funds raised x Balance outstanding as a percentage of total funds (other than equity) as on any day, but not more than seven calendar days prior to the date from which the MCLR becomes effective.

b) **Negative carry on account of** Cash reserve ratio (CRR)- Negative carry on the mandatory CRR arises because the return on CRR balances is nil. Negative carry on mandatory Statutory Liquidity Ratio (SLR) balances may arise if the actual return thereon is less than the cost of funds.

c) **Operating Cost** associated with providing the loan product, including cost of raising funds, but excluding those costs which are separately recovered by way of service charges.

d) **Tenor Premium**—The change in tenor premium cannot be borrower specific or loan class specific. In other words, the tenor premium will be uniform for all types of loans for a given residual tenor. Banks may publish every month the internal benchmark/ MCLR for the following maturities:

- Overnight MCLR,
- One-month MCLR,
- Three-month MCLR,
- Six month MCLR,
- One year MCLR.
- MCLR for any other maturity which the bank considers fit.

Banks have the freedom to offer all categories of advances on fixed or floating interest rates. Banks have to determine their actual lending rates on floating rate advances in all cases by adding the components of spread to the MCLR. Accordingly, there cannot be lending below the MCLR of a particular maturity, for all loans linked to that benchmark. Fixed rate loans upto three years are also priced with reference to MCLR.

However, certain loans like Fixed rate loans of tenor above three years, special loan schemes formulated by Government of India, Advances to banks' depositors against their own deposits, Advances to banks' own employees etc. are not linked to MCLR.

Base Rate vs MCLR

Base rate calculation is based on cost of funds, minimum rate of return, i.e margin or profit, operating expenses and cost of maintaining cash reserve ratio while the MCLR is based on **marginal** cost of funds, tenor premium, operating expenses and cost of maintaining cash reserve ratio. The main factor of difference is the calculation of marginal cost under MCLR. Marginal cost is charged on the basis of following factors- interest rate for various types of deposits, borrowings and return on net worth. Therefore MCLR is largely determined by marginal cost of funds and especially by deposit rates and REPO RATE.

Impact:

As a result of the increase in MCLR, borrowers who have taken home, vehicle, and personal loans will find their **equated monthly instalments (EMIs) rising in the coming months.**

MCLR-linked loans had the largest share (53.1%) of the loan portfolio of banks as of December 2021. The rise in MCLR will cause **resetting such loans at higher rates, due to the rise in WALR (weighted average lending rate)** on outstanding rupee loans more than the policy repo rate cuts during the EBLR period.

Note: MCLR is one of the internal benchmark lending rates

External Benchmark Lending Rate-

To ensure complete transparency and standardization, RBI mandated the banks to adopt a uniform external benchmark within a loan category, effective 1st October, 2019. Unlike MCLR which was internal system for each bank, RBI has offered banks the options to choose from **4 external benchmarking mechanisms:**

- The RBI repo rate
- The 91-day T-bill yield
- The 182-day T-bill yield

- Any other benchmark market interest rate as developed by the Financial Benchmarks India Pvt. Ltd.

When the RBI hikes the repo rate, EBLR will go up and vice-versa.

44. Off budget finance

Section: Fiscal Policy

Concept

What is off budget financing?

- off budget financing also known as 'extra' budget borrowing is used by the Centre to finance its expenditures while keeping the debt off from its annual statement. Such borrowings are not counted in the calculation of the fiscal deficit.
- Off-budget borrowings are loans that are taken not by the Centre directly, but by another public institution which borrows on the directions of the central government. Such borrowings are used to fulfil the government's expenditure needs.
- But since the liability of the loan is not formally on the Centre, the loan is not included in the national fiscal deficit. This helps keep the country's fiscal deficit within acceptable limits.
- As a result, as a Comptroller and Auditor General report of 2019 points out, this route of financing puts major sources of funds outside the control of Parliament. Such off-budget financing is not part of the calculation of the fiscal indicators despite fiscal implications.
- In India, the off-budget financing is also excluded from the Fiscal Responsibility and Budget Management (FRBM) Act, which intends to bring transparency and accountability to the monetary actions of the government.

The off-budget borrowings are loans that government does not take directly, but public institutions borrow after the Centre's order. These borrowings are intended to fulfill the government's expenditure needs.

How are off-budget borrowings raised?

- The government can ask an implementing agency to raise the required funds from the market through loans or by issuing bonds.
- Other public sector undertakings have also borrowed for the government.
- Public sector banks are also used to fund off-budget expenses.

45. Short Selling in India

Section :Capital Market

Concept :

- Market regulator **Sebi has indicated to the Supreme Court that it is not in favour of banning short-selling or sale of borrowed shares**, and said it is investigating allegations made by a short-seller against the Adani Group as well as its share price movements.
- Background
- Initially, market regulator SEBI has banned short selling of securities in 2001.
- After that, SEBI issued short-selling guidelines for institutional investors in July 2007.
- Seven years after short selling was banned, **both retail and institutional investors had the option to go short in 2008.**

Broad framework for short selling in India

- Short selling" shall be defined as selling a stock which the seller does not own at the time of trade.
- **All classes of investors**, viz., retail and institutional investors, **shall be permitted to short sell.**
- **Naked short selling shall not be permitted in the Indian securities market** and accordingly, **all investors would be required to mandatorily honour their obligation of delivering the securities** at the time of settlement.
- **No institutional investor shall be allowed to do day trading** e., square-off their transactions intra-day. In other words, all transactions would be grossed for institutional investors at the custodians' level and the institutions would be required to fulfill their obligations on a gross basis.
- The custodians, however, would continue to settle their deliveries on a net basis with the stock exchanges.
- The stock exchanges shall frame necessary uniform deterrent provisions and take appropriate action against the brokers for failure to deliver securities at the time of settlement which shall act as a sufficient deterrent against failure to deliver.
- A **scheme for Securities Lending and Borrowing (SLB)** shall be **put in place to provide the necessary impetus to short sell.** The introduction of a fullfledged securities lending and borrowing scheme shall be simultaneous with the introduction of short selling by institutional investors.
- The **securities traded in F&O segment shall be eligible for short selling.**
- SEBI may review the list of stocks that are eligible for short selling transactions from time to time.
- The **institutional investors shall disclose upfront at the time of placement of order whether the transaction is a short sale.**
- However, **retail investors would be permitted to make a similar disclosure by the end of the trading hours on the transaction day.**

- The brokers shall be mandated to collect the details on scrip-wise short sell positions, collate the data and upload it to the stock exchanges before the commencement of trading on the following trading day.
- The stock exchanges shall then consolidate such information and disseminate the same on their websites for the information of the public on a weekly basis.
- The frequency of such disclosure may be reviewed from time to time with the approval of SEBI.

Debate over Short selling

- Proponents of short selling consider it an **outstanding and fundamental feature of the securities market**.
- On the other hand, **critics of short selling firmly believe that short selling poses potential risks** and can quickly destabilise the market.
- **Securities market regulators** in most countries, particularly in all **developed securities markets**, recognise **short selling as a legitimate investment activity**.
- The **International Organisation of Securities Commissions (IOSCO)** also examines short selling and securities lending practices in various markets and recommends greater transparency in short selling rather than a ban on short selling.

Naked Short Selling

- In naked short selling, **stocks are not borrowed**.
- Therefore, in times of panic, more people could dump their **holdings, without any obligation to fulfil their settlements**, thereby pushing the prices of the stock further down.
- It is **illegal in India**.

Difference between covered short sales and naked short sales

- Covered short sales are those in which the seller arranges for the delivery of shares he has sold by borrowing them. Naked short sales are those in which the seller does not intend to provide for the delivery of shares he has sold.

46. Moderating Current Account Deficit

Section : External sector

Concept :

- There are indications that the current account deficit (CAD) will moderate despite the global slowdown triggered by the rising inflation and interest rates.
- According to the RBI, the CAD was at **\$36.4 billion for the quarter ending September 2022** and is **expected to moderate in the second half of 2022-23**.
- CAD for the first half of 2022-23 stood at 3.3% of GDP.
- The situation has shown improvement in Q3:2022-23 as imports moderated in the wake of lower commodity prices, resulting in narrowing of the merchandise trade deficit.

Factors responsible for moderating CAD:

- The moderation in CAD was **aided by:**
- the **fall in commodity prices**,
- **rising workers remittances** and services exports, and
- **abatement of selling pressure by foreign investors**.
- Recently, there has been **sharp drop in imports** which also led to the moderation of CAD.
- This **sharp decline in imports was due to:**
- Non-oil imports falling, mainly due to a price impact;
- Softening in domestic demand post the festive season;
- Seasonal impact of the Chinese New Year holidays.

How will moderating CAD impact the market?

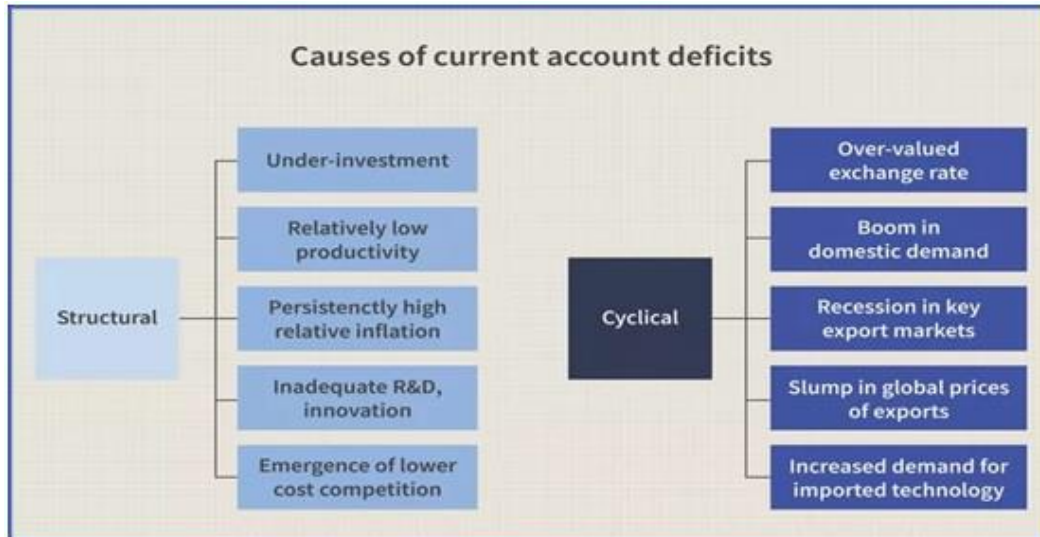
- While **rising CAD raises concerns among investors as it hurts the currency** and thereby the inflow of funds into the markets, a notable **decline in CAD** in January has **improved market sentiments**.
- CAD is very important for the currency.
- The value of an economy hinges a lot on the value of its currency and thereby, it also supports the equity markets by keeping the fund flow intact.

Current Account Deficit (CAD)

- It is a **measurement of a country's trade where the value of the goods and services it imports exceeds the value of the products it exports**.
- The current account includes **net income, including interest and dividends, and transfers, like foreign aid**.
- It represents a country's foreign transactions and, like the capital account, is a component of a country's Balance of payments (BOP).

Significance of CAD

- CAD and the fiscal deficit together make up the **twin deficits** – the enemies of the stock market and investors.
- If the **current account shows surplus**, that **indicates money is flowing into the country**, **boosting the foreign exchange reserves** and the **value of rupee against the dollar**.
- While an existing deficit can imply that a country is spending beyond its means, **having a current account deficit is not inherently disadvantageous**.
- If a country uses external debt to finance investments that have higher returns than the interest rate on the debt, the country can remain solvent while running a current account deficit.
- If a country is unlikely to cover current debt levels with future revenue streams, however, it may become insolvent.



47. Transfer Pricing

Section : Fiscal Policy

Concept :

- The Income Tax department recently conducted surveys in BBC offices located in Mumbai, Delhi, and in different other cities in the country.
- According to the IT Department, the BBC has violated “**Transfer Pricing Rules**”. Transfer Pricing is a practice where one company charges another (in the same division). The parent company of both companies is the same.

What is transfer pricing?

- Transfer pricing is an **accounting practice that represents the price that one division in a company charges another division for goods and services provided**.
- In such transactions, one party transfers to another goods or services, for a price known as transfer price.
- This may be arbitrary and dictated, with no relation to cost and added value, diverge from the market forces.
- Hence, the expression “transfer pricing” generally refers to prices of transactions between associated enterprises which may take place under conditions differing from those taking place between independent enterprises.

Understanding transfer pricing

- Suppose a company A purchases goods for 100 rupees and sells it to its associated company B in another country for 200 rupees, who in turn sells in the open market for 400 rupees.
- Had A sold it direct, it would have made a profit of 300 rupees. But by routing it through B, it restricted it to 100 rupees, permitting B to appropriate the balance.
- The transaction between A and B is arranged and not governed by market forces. The profit of 200 rupees is, thereby, shifted to the country of B.
- The goods is transferred on a price (transfer price) which is arbitrary or dictated (200 hundred rupees), but not on the market price (400 rupees).

What effect does transfer pricing have?

- The parent company — or a specific subsidiary — tends to produce insufficient taxable income or excessive loss on a transaction.
- Profits accruing to the parent can be increased by setting high transfer prices to siphon profits from subsidiaries domiciled in high-tax countries, and low transfer prices to move profits to subsidiaries located in low-tax jurisdiction.

What is the “arm’s length arrangement” that the BBC has allegedly violated?

- **Section 92F of the Income Tax Act, 1961** defines arm's length price as a **price which is applied or proposed to be applied in a transaction between persons other than associated enterprises, in uncontrolled conditions.**
- i.e., the price a division or subsidiary of a company pays to buy goods or services from another division or subsidiary should be the same as the market rate — as if the two entities were unrelated.
- This is the rule the BBC has allegedly violated.

48. Draft Norms on Banks' Minimum Capital Requirement

Section: Monetary Policy

Concept :

- The Reserve Bank of India has issued draft guidelines on minimum capital requirements for market risk as a part of the convergence of banking regulations with Basel III standards.
- The central bank has sought feedback on the norms by April 15, and has proposed that the final norms will come into effect from April 1, 2024.

Key highlights of the draft guidelines

- As per the proposed norms, banks will use the **simplified standardised approach to compute risk-weight assets for market risk.**
- **Market risk** is defined as the **risk of losses in on- and off-balance-sheet positions arising from movements in market prices.**
- The risks subject to market risk capital requirements include **interest rate risk and equity risk for trading book instruments, and foreign exchange risk** for trading book and banking book instruments.
- The capital requirement arising from the simplified standardised approach is the sum of the capital requirements arising from each of the three risk classes—**interest rate risk, equity risk, and forex risk.**
- Banks have to maintain the **minimum capital requirement in terms of two separately calculated amounts**—first “**specific risk**” of each security, both for short and long positions, and second “**general market risk**” towards interest rate risk in the portfolio.
- The capital requirement for interest rate risk for the “specific risk” category will be computed based on the lowest rated debt instrument attracting the highest specific risk capital charge, and capital requirements for “general market risk” need to capture the risk of loss arising from changes in market interest rates.
- The capital requirement for equity risk for specific risk will be 9%, and for general market risk 9%.
- The guidelines are **not applicable to cooperative banks, local area banks, payments banks, regional rural banks, and small finance banks.**

49. RBI issues draft norms for lending of government securities

Section : Monetary Policy

Concept :

- The Reserve Bank of India came out with draft norms (Reserve Bank of India (Government Securities Lending) Directions, 2023) for **lending and borrowing of government securities with wider participation in the securities lending market.**

Key-highlights of the draft guidelines

- Government Securities Lending (GSL) transactions shall be undertaken for a **minimum period of one day and a maximum period of ninety days.**
- Government securities **issued by the central government excluding Treasury Bills** would be eligible for **lending/borrowing** under a GSL transaction.
- Government securities **issued by the central government (including Treasury Bills)** and the state governments would be eligible for **placing as collateral** under a GSL transaction.
- An **entity eligible to undertake repo transactions in government securities, and any other entity approved by the Reserve Bank** would be eligible to participate in GSL transactions as lender of securities.

Kindly refer this article for notes on G-secs – <https://optimizeias.com/g-sec-2/>

50. Global slowdown path still uncertain, India to decouple

Section: External Sector

Concept :

- Recently, the RBI predicted that **even though the global slowdown in 2023 may be milder** than previously anticipated, the **trajectory still remains unpredictable.**
- It was **stated that India's economy would likely decouple from the rest of the world.**
- Domestic consumption and investment will benefit from improved agricultural and related activity prospects, increased business and consumer confidence, and rapid credit growth.

What is decoupling?

Decoupling, in this context, simply means that **the Indian economy is resilient on its own and isn't dependent anymore on global factors** and hence isn't affected by issues like Russia-Ukraine War, inflation, falling growth, etc.

52. Sticky Inflation and January Spike

Section : Inflation and unemployment

Concept :

- **In January, consumer price inflation hit a three-month high of 6.52 percent**, compared to 5.72 percent in December, driven by a significant increase in cereal prices and stickiness of core inflation.

What contributed to the latest spike in inflation?

- **Rise in food prices:** With food accounting for 46 per cent of the overall CPI basket, a rise in food inflation from roughly 4 per cent in December 2022 to more than 6 per cent in January 2023 has played an important role in overall inflation going up.
- **Cereal inflation is soaring high:** Within food, one component that has proved rather stubborn is cereal inflation. Between May and December 2022, year-on-year cereal inflation nearly doubled from 5 per cent to 14 per cent. In January 2023, this increased to 16 per cent. Within cereals, inflation in wheat has been steadily going up. Between May and December 2022, wheat inflation increased from 9 per cent to 22 per cent. It increased even further to 25 per cent in January 2023.
- **The steep rise in wheat prices reflects shortages:** Data from the Food Corporation of India shows that stocks in government warehouses declined. The government has recently approved a release of three million tonnes in the open market. However, this is insufficient to restore market supplies.
- **Stickiness of core inflation:** Second, **core (non-food, non-fuel) inflation in January came out to be 6.2 percent**. This is consistent with the unyielding core inflation of 6 per cent for nearly three years now. A persistently high core inflation implies that price pressures have become entrenched in the system.
- **External factors also play a role:** Inflation in developed countries continues to be high (6.4 per cent in the US; 8.5 per cent in the EU; 10.5 per cent in the UK). India is importing some of this elevated inflation through international trade in goods and services.
- Moreover, with China gradually opening up its economy after nearly three years of zero-Covid restrictions, commodity prices are likely to go up, which could exert renewed pressures on India's inflation.

Core Inflation

- The core inflation rate **measures rising prices in everything except food and energy**.
- That's because gas prices tend to escalate now and then. Higher gas costs increase the price of food and anything else that has large transportation costs.

Is India's inflation turning out to be sticky?

- Inflation is taking longer than expected to fall essentially **because higher food and fuel prices have seeped into broader economy and made other things costlier**.
- India is not the only country facing sticky inflation – many others including USA and European nations are struggling to extricate themselves from sticky inflation.

Sticky Inflation

- Sticky inflation is an **undesirable economic situation** where there is a combination of **stubbornly high inflation, (and often stagnant growth)**.
- Sticky inflation is often associated with cost-push factors, i.e. factors which cause a rise in the inflation rate but also lead to lower spending and economic growth.

53. India and Singapore link payment services

Section : Monetary Policy

Concept :

- **India and Singapore** have **integrated their respective real-time payment network** for the first time to **facilitate cross-border exchange**.
- India's **Unified Payments Interface (UPI)** and its equivalent in Singapore known as **PayNow** have been conjoined.
- This will enable **transfer of remittances, funds and payments** between the two countries in a **quick and real-time**.
- Now residents of Singapore and India can instantly transfer money to each other via Unified Payments Interface (UPI) and PayNow.
- The low-cost, faster and 24x7 cross-border connectivity project can be utilised by Indians using Google Pay, Paytm and other similar digital payment systems to transfer money to people in Singapore.

Unified Payments Interface (UPI)

- UPI is a system that powers multiple bank accounts into a single mobile application (of any participating bank).
- It does so by merging several banking features, seamless fund routing & merchant payments into one hood.

- In other words, UPI is an interface via which one can transfer money between bank accounts across a single window.
- UPI supports both Person-to-Person (P2P) and Person-to-Merchant (P2M) payments and it also enables a user to send or receive money.
- It was launched in 2016, by the National Payments Corporation of India (NPCI).
- **Features :**
 - Immediate money transfer through mobile device round the clock 24*7 and 365 days
 - Hassle free transactions as customers are not required to enter the details such as Card no, Account number, IFSC etc.

PayNow

- Similar to India's fast payment system UPI, **PayNow is Singapore's counterpart.**
- With just a mobile number, users can send and receive funds from one bank or e-wallet account to another in Singapore.
- This peer-to-peer payments linkage is enabled through participating banks and Non-Bank Financial Institutions (NFI) in the country.

54. Angel Tax

Section: Fiscal Policy

Concept :

- A senior government official recently said that the 'angel tax' provision in the Finance Bill will not impact startups in India.
- The Finance Bill 2023 has proposed some changes that will remove the exemption for foreign funds and non-resident investors, who will now have to pay Angel Tax on the difference between capital raised and the fair value of securities sold.

About Angel Tax:

- Angel Tax is a term basically **used to refer to the income tax payable on the capital raised by unlisted companies via the issue of shares through off-market transactions.**
- The **excess funds raised at prices above fair value is treated as income**, on which tax is levied.
- It derives its genesis from **section 56(2)(viib) of the Income Tax Act, 1961.**
- It was **introduced in 2012** to prevent black money laundering through share sales.
- The Angel Tax is levied at a rate of 30.9% on net investments in excess of the fair market value.
- In 2019, the Government announced an exemption from the Angel Tax for startups on fulfillment of certain conditions. These are,
- The startup should be **recognized by the Department for Promotion of Industry and Internal Trade (DPIIT)** as an eligible startup.
- The **aggregate amount of paid-up share capital and share premium of the Startup cannot be more than ₹25 crores.** This amount does not include the money raised from Non-Resident Indians (NRIs), Venture Capital Firms, and specified companies.
- For **angel investors, the amount of investment that exceeds the fair market value can be claimed for a 100% tax exemption.** However, the investor must have a net worth of ₹2 crores or an income of more than ₹25 Lakh in the past 3 fiscal years.

Changes introduced in the Budget 2023-24

- Before budget 2023-24, angel tax was imposed only on investments made by a resident investor.
- i.e., it was not applicable in case the investments are made by any non-resident or venture capital funds.
- The Finance Bill, 2023 has proposed to amend Section 56(2) VII B of the Income Tax Act.
- With this, the **government has proposed to include foreign investors in the ambit**, meaning that when a **start-up raises funding from a foreign investor, that too will now be counted as income and be taxable.**
- However, these **foreign investors will not need to pay any angel tax while investing in a government-recognized (Department for Promotion of Industry and Internal Trade (DPIIT) registered) startup in India — similar to the provision for domestic investors.**

Eligibility Criteria for Startup Recognition:

- The Start-up should be **incorporated as a private limited company or registered as a partnership firm or a limited liability partnership.**
- **Turnover should be less than INR 100 Crores** in any of the previous fiscal years.
- An entity shall be **considered a Start-up up to 10 years from the date of its incorporation.**
- The Start-up should be working towards innovation/ improvement of existing products, services, and processes and should have the potential to generate employment/ create wealth.
- An entity formed by splitting up or reconstruction of an existing business shall not be considered a "Startup".

55. Rupee trade facing friction as bank's wary of US sanction

Section: External Sector

Concept :

- There is a **lack of clarity among banks about the International Trade Settlement mechanism in rupees (INR) and those with exposure to the U.S. are wary of sanctions**, the Chairman of India's Engineering Export Promotion Council (EEPC) said.
- Early last year, the Reserve Bank of India (RBI) had set up the **International Trade Settlement mechanism in rupee**, a move aimed at facilitating trade with countries under sanctions such as Russia.

Indian rupee trade settlement mechanism

- The RBI has announced the setting up of this mechanism to carry out international trade in Indian rupees.
- The Indian rupee trade settlement mechanism is a **means of using the Indian rupee in all international transactions instead of dollars and other big currencies**.
- **Special vostro rupee accounts, or SVRA**, have been opened by the **Indian banks with the banks of Mauritius, Russia, Sri Lanka**.

For Importers in India:

- Importers in India undertaking imports through the mechanism will be required to make payment in rupees which must be credited into the Vostro account of the correspondent bank of the partner country, against the invoices for the supply of goods or services from the overseas seller or supplier.

For exporters of India:

- In a similar way, exporters of India exporting goods and services through this mechanism must be paid the export proceeds in the Indian currency from the balance in a designated Vostro account of the correspondent bank of the partner country.

Vostro & Nostro Account

- A vostro account is a record of money held by a bank or owed to a bank by a third party (an individual, company or bank).
- The nostro account is a way of keeping track of how much of the bank's money is being held by the other bank.
- For further reference – <https://optimizeias.com/vostro-account/>

56. OBICUS

Section : Monetary Policy

- **The RBI has been conducting the OBICUS of the manufacturing sector on a quarterly basis since 2008.**
- **It stands for** – Order Books, Inventories and Capacity Utilization Survey (OBICUS).
- The survey provides an **insight into the demands of the Indian manufacturing sector**.
- The survey **covers 2,500 companies both in the public and private sector**.
- The survey represents the **movements in actual data on order books, inventory levels of raw materials and finished goods and capacity utilization**.
 - Inventory is the amount of goods held by a company.
 - Capacity utilization refers to the manufacturing and production capabilities that are being utilized by a nation or enterprise.
- The survey also gives out the **ratio of total inventories to sales and ratio of raw material (RM) and finished goods (FG) inventories to sales in percentages**.
- It is considered as an important indicator to measure economic activity, inflationary pressures and the overall business cycle.
- The survey provides valuable input for monetary policy formulation.
- The Reserve Bank of India has launched the **58th round of its Order Books, Inventories and Capacity Utilisation Survey (OBICUS)**. The survey is for the reference period April – June 2022 (Q1:2022-23).

57. NSE gets final nod from SEBI for Social stock exchange

Section: Financial Market

Concept :

- The National Stock Exchange (NSE) has received final approval from the Securities and Exchange Board of India (SEBI) to set up a Social Stock Exchange (SSE) as a separate segment of the NSE.

About Social Stock Exchange:

- SSE is a stock exchange, intended to benefit the private and non-profit sectors by directing more capital to them.
- The SSE will function as a distinct division of the current stock exchanges under the new regulations.
- Countries like **the UK, Canada and Brazil have SSEs**.

Who can list on SSE?

- **Not-for-profit organisations (NPOs) and for-profit social enterprises with social intent** and impact as their primary goal will be eligible to participate in the SSE.
- The social enterprises will have to **engage in a social activity out of 16 broad activities listed by the regulator (SEBI).**
- The eligible activities include-
 - Eradicating hunger poverty, malnutrition and inequality
 - Promoting healthcare, supporting education, employability and livelihoods
 - Gender equality empowerment of women LGBTQIA communities.
 - Supporting incubators of social enterprise.
- Corporate foundations, political or religious organisations or activities, professional or trade associations, infrastructure companies, and housing companies, except affordable housing, **will not be eligible to be identified as social enterprises.**
- According to **Sebi's framework**, a **minimum issue size of ₹1 crore** and a minimum **application size for the subscription of ₹2 lakh are currently required for SSE.**
- **Minimum requirements for sustenance**
 - NPO needs to be **registered as a charitable trust** and should **be registered for at least three years, must have spent at least ₹50 lakh annually** in the past financial year.
 - They should have **received a funding of at least ₹10 lakh in the past financial year.**

58. Carbon Calculator

Section: Climate Change

Context: British Petroleum created an advertising campaign that encouraged average people to use a personal carbon calculator. The campaign told consumers that it was time to go on a low-carbon diet – a guilt-laden message that intentionally suggested individuals might halt climate change if only they had the will.

More on the News:

- Before BP's ads, **Google searches for "carbon footprint" and "carbon footprint calculator" barely registered**, often receiving a zero from Google Trends.
- With the campaign in force, the terms gained popularity, and by 2008 both terms sometimes scored near the top of the Google Trends scale.
- According to the **"Carbon Majors" report from the Climate Accountability Institute**, 108 fossil fuel and cement entities release **nearly 70% of all global carbon emissions**, with BP in third place among US-tied fossil fuel polluters, just behind Chevron and ExxonMobil. The reality is that they the **fossil fuel industry must drastically change** if the world is going to reckon with the climate crisis.
- This is why, at the end of the day, carbon footprint calculators have a place in individuals' lives. They **may have been promoted by Big Oil** in an act of misdirection, but used knowingly, they can **guide us toward the top-to-bottom collective action** needed to address climate change.

Carbon Calculator

- A carbon calculator is a tool that helps individuals or organizations **estimate their carbon footprint.**
- Carbon calculators work by asking users a series of questions **about their energy consumption, transportation habits**, and other relevant activities, and then calculating the estimated amount of carbon emissions associated with those activities.
- By using a carbon calculator, individuals and organizations **can get a better understanding of their environmental impact** and identify ways to reduce their carbon footprint.
- Many carbon calculators also **provide tips and recommendations** for reducing emissions, such as driving less, using energy-efficient appliances, or investing in renewable energy sources.

Carbon Footprint:

- A carbon footprint is the **total amount of greenhouse gases (GHGs) that are emitted directly or indirectly** by an individual, organization, product, or activity.
- It is **usually measured in metric tons of carbon dioxide equivalents (CO₂e).**
- Carbon footprints **are calculated by taking into account all the sources** of greenhouse gas emissions associated with an individual or organization's activities, including:
 - **Direct emissions** from burning fossil fuels (such as gasoline, diesel, or natural gas) for heating, electricity, transportation, and industrial processes.
 - **Indirect emissions** from the production, transportation, and disposal of goods and services used by an individual or organization, including food, clothing, and electronics.

Ecological Footprint

- The ecological footprint is a method promoted by the Global Footprint Network to measure human demand on natural capital, i.e. the quantity of nature it takes to support people or an economy.
- It tracks this demand through an ecological accounting system.
- In short, it is a measure of human impact on the environment.

- Both the Ecological Footprint and biocapacity are expressed in **global hectares**—globally comparable, standardized hectares with world average productivity.
- Ecological Footprint accounting measures the demand on and supply of nature.
 - On the **demand side**, the Ecological Footprint adds up all the productive areas for which a population, a person or a product competes. It measures the ecological assets that a given population or product requires to produce the natural resources it consumes (including plant-based food and fiber products, livestock and fish products, timber and other forest products, space for urban infrastructure) and to absorb its waste, especially carbon emissions.
- The Ecological Footprint tracks the use of productive surface areas. Typically these areas are: cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land.
 - On the **supply side**, a city, state or nation's biocapacity represents the productivity of its ecological assets (including cropland, grazing land, forest land, fishing grounds, and built-up land). These areas, especially if left unharvested, can also serve to absorb the waste we generate, especially our carbon emissions from burning fossil fuel.
- If a population's Ecological Footprint exceeds the region's biocapacity, that region runs a **biocapacity deficit**.
 - Its demand for the goods and services that its land and seas can provide—fruits and vegetables, meat, fish, wood, cotton for clothing, and carbon dioxide absorption—exceeds what the region's ecosystems can regenerate.
 - In more popular communications, we also call this “an ecological deficit.”
 - A region in ecological deficit meets demand by importing, liquidating its own ecological assets (such as overfishing), and/or emitting carbon dioxide into the atmosphere.
- If a region's biocapacity exceeds its Ecological Footprint, it has a **biocapacity reserve**.

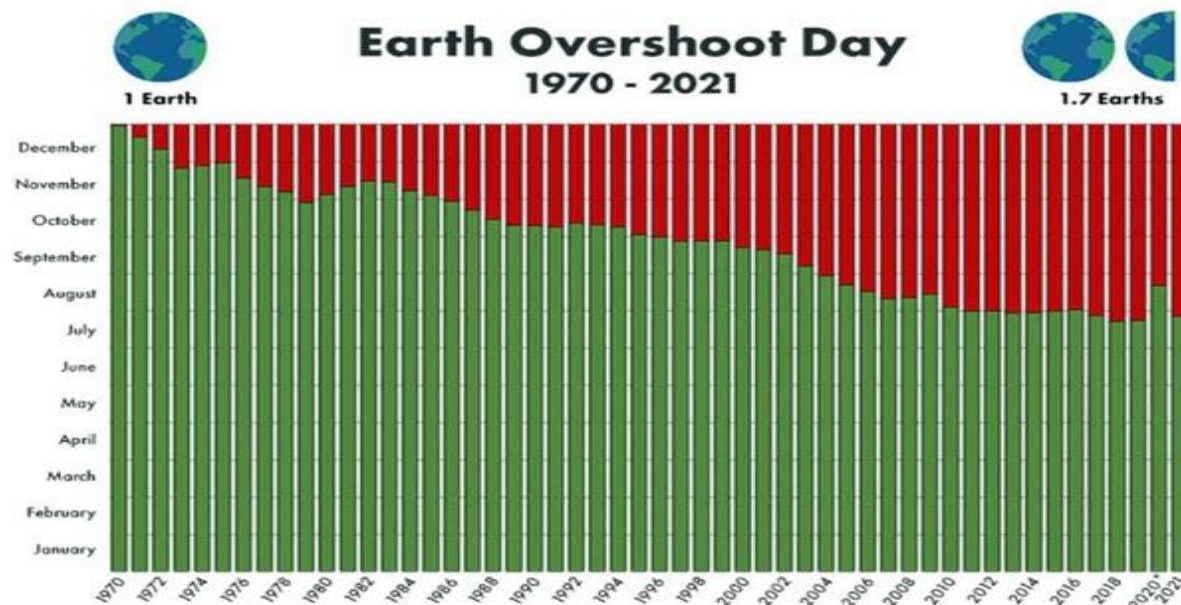


What is Earth Overshoot Day?

- When the entire planet is running an ecological deficit, we call it “overshoot.” At the global level, ecological deficit and overshoot are the same, since there is no net import of resources to the planet.
- Overshoot occurs when:

HUMANITY'S ECOLOGICAL FOOTPRINT > EARTH'S BIOCAPACITY

- Earth Overshoot Day marks the date when humanity's demand for ecological resources and services (Ecological Footprint) in a given year exceeds what Earth can regenerate in that year (biocapacity).
- According to the World Wide Fund for Nature (WWF), humanity has again used up all biological resources that our planet regenerates during the entire year by 29th July, 2021.
- Humanity currently uses 74% more than what the planet's ecosystems can regenerate — or 1.7 Earths.
- From Earth Overshoot Day until the end of the year, humanity operates on ecological deficit spending.



Earth has overshoot its resources budget

Humanity has used up this year's allowance of natural resources by July 29, a Global Footprint Network study says

EARTH OVERSHOOT DAY

Calculated since 1986 by the think tank Global Footprint Network, Earth Overshoot Day is the day on which humanity's consumption of resources, such as water, soil and clean air, for the year far exceed Earth's capacity to regenerate those resources in the same year

EARLIEST IN TWO DECADES

The 2019 Earth Overshoot Day is the earliest ever with the Day moving up by two months every year in the past two decades. In 1993, it fell on October 21, in 2003 on September 22, and in 2017 on August 2

1.75 PLANETS REQUIRED

At current consumption pace, the equivalent of 1.75 planets would be required to produce enough to meet humanity's needs

SEVERE CONSEQUENCES

According to the report, the cost of this global ecological overspending is evident in the form of "deforestation, soil erosion, biodiversity loss, or the buildup of carbon dioxide in the atmosphere"



INCREASED CO2 EMISSIONS

A major cause of the date falling earlier and earlier was growing amounts of CO2 emissions which contributes to "climate change and more frequent extreme weather events"

"We have only got one Earth - this is the ultimately defining context for human existence. We can't use 1.75 (earths) without destructive consequences."

Global Footprint Network

- Global Footprint Network, founded in 2003, is an independent think tank originally based in the United States, Belgium and Switzerland. It was established as a charitable not-for-profit organization in each of those three countries.
- Global Footprint Network develops and promotes tools for advancing sustainability, including the ecological footprint and biocapacity, which measure the amount of resources we use and how much we have. These tools aim at bringing ecological limits to the center of decision-making.
- The Network brings together over 70 partner organizations, including WWF International, ICLEI, Bank Sarasin, The Pictet Group, the New Economics Foundation, Pronatura México, and the Environment Agency Abu Dhabi.

59. Mercury Pollution

Section: Pollution

Context: Kodaikanal Mercury Poisoning Episode Has Lessons for Current, Future Generations

Mercury:

- Mercury is a chemical element with the symbol Hg and atomic number 80.
- Mercury is a **naturally occurring element** that is found in air, water and soil.
- It is a **dense, silvery-white metal**.

- It is the **only metal that is liquid** at room temperature.
- Mercury has a **relatively low melting point and boiling point** compared to other metals
- It is useful in various applications, such as **thermometers, barometers, electrical switches, and fluorescent lamp** Mercury is also used in **dental amalgams** and in some medical and scientific instruments.

Sources of Mercury Pollution

- Mercury pollution can come from both natural and human-made sources. Natural sources of mercury pollution include **volcanic eruptions, forest fires, and weathering of mercury-containing rocks**. However, the majority of mercury pollution is caused by human activities, including:
 - **Coal-fired power plants:** Coal contains trace amounts of mercury, which are released into the air when coal is burned. These emissions can travel long distances and accumulate in the environment.
 - **Artisanal and small-scale gold mining:** Mercury is used to extract gold from ore in small-scale gold mining operations. It can release large amounts of mercury into the air and water, causing serious health and environmental problems.
 - **Industrial processes:** Certain industrial processes, such as chlorine production, can release mercury into the air and water.
 - **Waste incineration:** Burning waste, particularly medical waste, can release mercury into the air.
 - **Consumer products:** Mercury is used in some consumer products, such as thermometers, fluorescent light bulbs, and batteries.

Effects of Mercury Pollution

- Mercury pollution can have a wide range of negative effects on human health, wildlife, and the environment. Here are some of the major effects of mercury pollution:
- **Health effects:** Mercury is a toxic substance that can cause serious health problems, particularly to children and pregnant women. Exposure to high levels of mercury can **damage the brain, kidneys, and central nervous system**, leading to developmental delays, impaired cognitive function, and other health problems.
- **Wildlife impacts:** Mercury pollution can have serious impacts on wildlife, particularly fish and other aquatic species. Mercury **can accumulate in the food chain**, with larger fish at the top of the chain containing higher levels of mercury. This can **lead to reproductive failure**, decreased growth and survival rates, and other health problems for wildlife.
- **Environmental impacts:** Mercury pollution can also have a range of environmental impacts, including reduced biodiversity, changes in species distribution, and decreased nutrient cycling in ecosystems. In addition, mercury pollution can contribute to climate change, as mercury emissions can **lead to the formation of ozone, a potent greenhouse gas**.
- **Economic impacts:** Mercury pollution can also have significant economic impacts, including reduced fish populations, **decreased tourism revenue**, and increased health care costs associated with mercury exposure.

Minamata Convention on Mercury

- The Minamata Convention on Mercury is a **global treaty to protect human health and the environment** from the adverse effects of mercury and its compounds.
- It was agreed at the fifth session of the Intergovernmental Negotiating Committee in Geneva, Switzerland 2013.
- The Convention also addresses interim storage of mercury and its disposal once it becomes waste, sites contaminated by mercury as well as health issues.
- The Convention covers all aspects of the life cycle of mercury, controlling and reducing mercury across a range of products, processes and industries. This includes controls on **mercury mining, the manufacture and trade of mercury and products containing mercury, disposal of mercury waste, emissions of mercury from industrial facilities**.
- India has ratified the Convention.

60. Net-zero buildings

Section: Climate Change

Context: Net-zero buildings in India witness a rise but lack government guidelines, regulations

More on the News:

- In the last few years, several buildings in India have become net-zero energy buildings by **offsetting their total annual energy requirement** with renewable energy and by increasing their energy efficiency.
- The Indian federal government currently has its Model Building Bye-Laws, **Energy Conservation Building Code** which promotes increased usage of clean energy in building design but broader norms and regulations on this are still lacking.
- The **Indian Green Building Council (IGBC) started voluntary ratings** of net-zero buildings in 2018, where energy-efficient building design and climate-responsive designs were also given weightage, besides the use of renewables.

Concept:

Net zero energy buildings

- Net zero energy buildings refer to such buildings which are **producing the same amount of non-fossil fuel energy** that they consume from the grid annually.
- However private rating agencies have stricter norms for net-zero buildings where **energy efficiency designs are also taken into account**.
- There is no clear definition of net-zero buildings in India from the government side. But usually in the building ecosystem, in general terms, **net-zero refers to net-zero energy buildings where the total amount of energy required in the building is compensated by the total amount of electricity produced by renewable sources of energy**.

Norms for net-zero energy buildings

Energy Conservation Building Code 2017

- **Released by Ministry of Power, Coal, New and Renewable Energy and Mines**
- It **prescribes new energy performance standards** for new commercial buildings to be constructed across India.
- The code **provides present as well as futuristic advancements in building technology** to cut down building energy consumption and promote low-carbon growth.
- The code sets clear criteria for builders, designers and architects to integrate renewable energy sources in building design through the inclusion of passive design strategies.
- ECBC 2017 **aims to optimise energy savings** with the comfort levels for occupants. The code aims to achieve energy neutrality in commercial buildings.
- To be ECBC-compliant, the new buildings should be able to demonstrate minimum energy savings of 25%. Energy savings of 35% and 50% will enable the buildings to achieve higher grades like ECBC Plus or Super ECBC status respectively.

Shunya scheme

- **Ministry of Power** in 2021 also started rating net-zero buildings with its Shunya scheme where the **BEE gives certification of net-zero buildings**.
- This is given if the **buildings can offset their building energy requirements** with renewable energy.
- Buildings producing renewable energy equivalent to their total consumption **get a Shunya (net-zero) label** whereas those producing more renewable energy than their connected load get a **Shunya Plus rating from BEE**.
- The documents of BEE certification for net-zero **do not account for energy efficiency** while granting net-zero rating certifications.

Indian Green Building Council

- The Indian Green Building Council (IGBC), a part of the Confederation of Indian Industry (CII) which was earlier known for rating Green Buildings in the country, started rating **“net zero”** buildings in 2018.
- The IGBC rating, which is **intent oriented and voluntary in nature, rates net zero buildings** based on their usage of renewable energy, energy efficiency, passive design strategies, and thermal comfort (comfortable room temperature).
- It **gives merely 25 percent weightage to the use of renewable energy** and focuses more on energy-efficient designs and other architectural parameters.

61. NSE Indices unveils municipal bond index

Sections : Msc

Concept :

- NSE Indices Ltd., an arm of the National Stock Exchange of India (NSE), had introduced the **country’s first municipal bond index**.
- The new Nifty India Municipal Bond Index will **track the performance of municipal bonds issued by Indian municipal corporations** across maturities and having investment grade credit rating.
- Currently, the **index has 28 municipal bonds issued by 10 issuers**, all having AA credit ratings. The index constituents are assigned weights based on the outstanding amounts.
- Raising money from capital markets incentivises municipal corporations to fund new projects and improve civic infrastructure while encouraging them to become financially disciplined and governance oriented.
- The index is computed using the total return methodology including price return and coupon return. The **index has a base date of January 1, 2021, and a base value of 1,000**. The index will be **reviewed quarterly**.

Municipal Bond Market

- The Indian municipal bond market has seen an upturn in issuances after **SEBI’s Issue and Listing of Municipal Debt Securities Regulations, 2015** was implemented and it led to an improved emphasis on municipal finance by policymakers.
- Raising money from capital markets stimulates municipal corporations to fund new projects as well as further enhance civic infrastructure while encouraging them to become financially disciplined and governance oriented.

Union Budget 2023

- In the Union Budget session 2023, the government mentioned that it will **be granting incentives to urban civic bodies for the improvement of their finances and creditworthiness**.

- Around 9 municipal bodies raised Rs 38.40 billion through bonds in the years 2016-17 and 2020-21, as stated in the report of the Reserve Bank of India.

For notes on municipal bonds, refer – <https://optimizeias.com/municipal-bonds/>

62. Government to amend offshore mining law

Concept:

- The Ministry of Mines is planning to map offshore mineral blocks to mine polymetallic nodules.
- This follows the Ministry's efforts to open up the sector to private miners after bringing in amendments to the **Offshore Area Mineral (Development & Regulation) Act, 2002**.
- **Composite License** – Exploration cum production licences will also be offered once the proposed amendments go through.
- However, **Mining of atomic minerals** will, however, **remain under State control** and will not be opened up to private miners.

Offshore Areas Mineral (Development and Regulations) Act

- In 2002, the Parliament passed the Offshore Areas Mineral (Development and Regulations) act.
- This Act aims at the **development and regulation of mineral resources on specific marine territories such as territorial waters, exclusive economic zone, continental shelf, and other maritime zones of India**.
- However, the act officially **came into effect from 15th January 2010**, vide an order dated 11th February 2020 notified by the Central Government.
- The Act **provides mandates for all minerals in offshore areas**. Even minerals listed under the Atomic Energy Act, 1962, are included in the said Act.
- However, **it excludes oils and related hydrocarbons**. Oils and hydrocarbons though are offshore minerals are dealt with under separate legislation.

Current procedure for offshore mining

- The government currently allocates offshore production leases for blocks containing higher grade atomic minerals, such as uranium and zircon to state controlled entities.
- However, the proposed amendments will allow production leases to be granted to the private sector and state controlled firms through auction route.
- The proposed amendment give powers to central government to fix the threshold value, above which the allocations will be given to state controlled entities.

Polymetallic Nodules and formation

- **Polymetallic nodules**, also known as **manganese nodules**, are **potato-shaped, largely porous nodules found in abundance carpeting the sea floor of world oceans in deep sea**.
- Besides **manganese and iron**, they contain **nickel, copper, cobalt, lead** etc which are of economic and strategic importance.

Formation :

- Formed by **slow precipitation of the metallic components from seawater**.
- This is thought to produce nodules with similar iron and manganese content and a relatively high grade of nickel, copper and cobalt.
- **Location:**
- Three areas have been selected by industrial explorers: the **centre of the north central Pacific Ocean, the Peru Basin in the south-east Pacific Ocean and the centre of the north Indian Ocean**.
- They can occur at any depth, but the **highest concentrations have been found between 4,000 and 6,000m**.

Significance of Polymetallic Nodules:

- They contain **Rare Earth Elements and metals** which are **important to high-tech industries**.
- The **amount of copper contained** in the CCZ nodules is estimated to be **about 20% of that held in global land-based reserves**.
- These Rare earth minerals are considered as the great source of valuable minerals such as gold, silver and zinc.

63. Economic Terminologies in news

Section: Monetary Policy / Money and Banking

Concept:

Hard Landing

- A hard landing refers to a marked economic slowdown or downturn following a period of rapid growth.

- The term “hard landing” comes from aviation, where it refers to the kind of high-speed landing that—while not an actual crash—is a source of stress as well as potential damage and injury.
- The metaphor is **used for high-flying economies that run into a sudden, sharp check on their growth**, such as a monetary policy intervention meant to curb inflation.
- Economies that experience a hard landing often slip into a stagnant period or even recession.

Soft Landing

- A soft landing, in economics, is a **cyclical slowdown in economic growth that avoids recession**.
- A soft landing is the goal of a central bank **when it seeks to raise interest rates** just enough to stop an economy from overheating and experiencing high inflation, **without causing a severe downturn**.
- Soft landing may also **refer to a gradual, relatively painless slowdown** in a particular industry or economic sector.

64. Green Energy Corridor Phase II

Section: Msc

Concept:

About

- The Green Energy Corridor Project aims at synchronizing electricity produced from renewable sources, such as solar and wind, with conventional power stations in the grid.
- Green Energy Corridor is an **intra-/ inter-state transmission system which is being implemented by eight renewable rich states in India** – Tamil Nadu, Rajasthan, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh and Madhya Pradesh.
- Intra-State Transmission System is being implemented by respective State Transmission Utilities (STU) and Inter-State Transmission System is being implemented by Power Grid Corporation of India Ltd. (PGCIL).
- The scheme will **facilitate grid integration and power evacuation of about 20 GW of renewable energy (RE) projects in seven states**.

Green Energy Corridor Phase 1

- The Government of India initiated the Green Energy Corridor project in 2013.
- It is under implementation in renewable resource rich states for the likely renewable power capacity addition during 12th Five Year Plan period.
- The first phase of green energy corridors is under implementation in Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu and will help supply around 20 GW of renewable energy by 2022.

Green Energy Corridor Phase 2

- It will **facilitate grid integration and power evacuation of approximately 20 GW of Renewable Energy (RE) power projects in seven States** namely, Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu and Uttar Pradesh.
- The **transmission systems will be created over a period of five year from Financial Year 2021-22 to 2025-26**.
- It is targeted to be set up with a total estimated cost of Rs. 12, 031 crores, and the Central Finance Assistance (CFA) will be 33% of the project cost.
- The CFA will help in offsetting the Intra-State transmission charges and thus keep the power costs down.
- The scheme will help in achieving the target of 450 GW installed RE capacity by 2030.

Significance:

- It will contribute to the long-term energy security of India and will promote ecologically sustainable growth by reducing carbon footprint.
- It will facilitate in generating large direct and indirect employment opportunities for both the skilled and unskilled personnel.

65. Blue Economy to be next GDP multiplier: CAG GC Murmu

Section : National income

Context: CAG is handling the SAI20 Summit on Blue Economy on occasion. The conference will focus on the study of the Blue Economy.

Concept:

Blue Economy to be next GDP multiplier:

- Around 80 per cent of the total volume of International trade in goods is carried by sea, according to the UN Conference on Trade and Development (UNCTAD). World Economic Forum, Davos Agenda 2022 recognized the fact that G20 Nations, primarily have 45 per cent of global coastline and jurisdictional responsibility over 21 per cent of the World's Exclusive Economic Zone.
- SDG 14 helps to focus attention on the priority area of the Blue Economy
- The blue economy occupies a vital position in India's economic growth and it could well be the next multiplier of GDP and well-being, provided sustainability and socio-economic welfare are kept at the centre stage
- India has a 7,517 km long coastline that is home to nine coastal states and 1,382 islands. The coastal economy sustains over 4 million fishermen and other coastal communities.
- There are nearly 199 ports, including 12 major ports that handle approximately 1,400 million tons of cargo each year,
- India's Exclusive Economic Zone of over 2 million square kilometres has a bounty of living and non-living resources with significant recoverable resources such as crude oil and natural gas.
- The blue economy occupies a vital potential position in India's economic growth. It could well be the next multiplier of GDP and well-being, provided sustainability and socio-economic welfare are kept at centre stage

Blue Economy:

- Blue Economy encompasses a wide range of economic activities pertaining to sustainable development of resources and assets in the **oceans, related rivers, water bodies and coastal regions** – in a manner that ensures equity, inclusion, innovation and modern technology
- **Blue Economy sectors include:** Fisheries, Aquaculture, Mariculture and Marine Products; Marine Biotechnology ; Offshore and Deep-Sea Mining ; Marine Tourism and Leisure ; Shipping, Port and Maritime Logistics ; Marine Construction ; Marine Renewable Energy Marine Manufacturing ; Marine Commerce and ICT and Marine Education and Research.

Mutiplier Effect

The multiplier effect refers to the effect on national income and product of an exogenous increase in demand. For example, suppose that investment demand increases by one. Firms then produce to meet this demand. That the national product has increased means that the national income has increased. Consequently, consumption demand increases, and firms then produce to meet this demand. Thus, the national income and product rises by more than the increase in investment. The multiplier effect is greater than one

Environment

1. Global Climate Finance

Section: Climate Change

Concept :

- For India to meet its international **"obligations"** on curtailing greenhouse gas emissions, it must have access to "ontime" climate finance, technology, and access to critical minerals.
- Advanced economies ought to set examples of policy and "behavioural changes" that work in their countries and only then could they be emulated in developing countries, the Economic Survey said on Tuesday in a dedicated chapter on climate change.

Global Climate Finance

- It refers to **local, national, or transnational financing—drawn from public, private and alternative sources of financing**—that seeks to **support mitigation and adaptation actions that will address climate change.**
- The **UNFCCC, Kyoto Protocol, and the Paris Agreement** call for **financial assistance from Parties with more financial resources** (Developed Countries) to **those that are less endowed and more vulnerable** (Developing Countries).
- This is in accordance with the principle of **"Common but Differentiated Responsibility and Respective Capabilities" (CBDR).**
- **In COP26, new financial pledges to support developing countries** in achieving the global goal for adapting to the effects of climate change were made.
- New rules for the international carbon trading mechanisms agreed at COP26 will support adaptation funding.

USD 100 Billion Target – Climate finance

- In 2009, at the UNFCCC COP15 (held in Copenhagen), the developed country parties, to achieve meaningful mitigation actions and transparency on implementation, **jointly set a target of USD 100 billion a year by 2020 to address the needs of developing countries.**
- The climate finance goal was then formally **recognized by the UNFCCC Conference of the Parties at COP16 in Cancun.**
- At COP21 in Paris, **Parties extended the \$100 billion goals through 2025.**

- **After COP26 there was a consensus that developed nations will double their collective provision of adaptation finance from 2019 levels by 2025**, in order to achieve this balance between adaptation and mitigation.

Financial Framework

- To assist the provision of climate financing, **UNFCCC established a financial framework to give financial resources to developing nation Parties.**
- The finance structure also **supports the Kyoto Protocol and the Paris Agreement.**
- It specifies that the **financial mechanism's operation can be entrusted to one or more existing international entities**, since the Convention's entrance into force in 1994, the **Global Environment Facility (GEF) has acted as the financial mechanism's operating institution.**
- Parties established the **Green Climate Fund (GCF) at COP 16 in 2010** and designated it as an operating entity of the financial mechanism in 2011.
- The **financial mechanism reports to the COP**, which determines its policies, programme priorities, and financing eligibility criteria.
- **Other Funds:**
- In addition to providing guidance to the GEF and the GCF, Parties have established two special funds—
 - **Special Climate Change Fund (SCCF)**
 - **Least Developed Countries Fund (LDCF)**
- **Both are managed by the GEF—and the Adaptation Fund (AF) established under the Kyoto Protocol in 2001.**
- At the Paris Climate Change Conference in 2015, the Parties agreed that the operating entities of the financial mechanisms – GCD, GEF, SCCF and the LDCF, shall serve the Paris Agreement.

2. Plan in place to eradicate invasive plant species from Kerala's wildlife habitat

Section: Biodiversity

Context: *Senna spectabilis* poses a severe threat to natural forests and should be removed using a threefold approach for large trees, large saplings, and small saplings.

More on the News:

- The **Nodal Centre for Biological Invasions (NCBI)** at the Kerala Forest Research Institute (KFRI) has come out with a management plan to **eradicate *Senna spectabilis***, the exotic invasive plant that is posing a severe threat to the State's wildlife habitat.
- The management plan stipulates that there should **not be an attempt to kill the trees** before a **detailed reforestation programme and the resources for implementing it are in place.**
- This involves developing an adequate number of large-sized saplings of native trees, **identification of nucleus sites** where the planting is to be made, and the provision for manpower.
- Once the resources and material for landscape restoration are ready, the invasive species **has to be removed using a threefold approach for large trees, large saplings, and small saplings.**
- **Debarking large trees:**
 - The large trees need to be **debarked from breast height downwards** (1.3 m above ground level), including the collar part of the tree. Once done, the trees should be **visited once a month to remove the new growth across** the debarked area.
 - Once the trees start to dry up, their soil seed bank will become active and a large number of plantlets will sprout. Manpower should be made available **to remove the sprouting plantlets.** The next is the larger saplings which can be uprooted using specially designed weed pullers.
 - The third is **the removal of small plantlets which need to be removed mechanically.** It is important to make sure that the **pulled-out saplings are dried without any contact with soil** **Planting of large saplings of native tree species should start** along with or before the start of *Senna* removal.
 - The large trees would take a **minimum of 18 months to completely dry up** after debarking.

Senna spectabilis

- *Senna spectabilis* is a plant species of the **legume family (Fabaceae) native to South and Central America.**
- They are often grown as **ornamental plants** due to their **bright yellow flowers** that bloom during the summer months.
- They are also known as **golden wonder tree, American cassia, popcorn tree, Cassia excelsa, golden shower tree** or **Archibald's cassia.**
- The plant has become an **invasive alien species** in parts of **Africa** such as **Kenya, Malawi, Tanzania and Uganda**, and also in **South India** after it was introduced for resources such as **firewood** as well as to help combat deteriorating ecosystems affected by deforestation and desertification.
- Currently, **spectabilis** is overtaking native tree species of forestry ecosystems worldwide because of its ability to grow quickly.

3. Mangrove Initiative for Shoreline Habitats & Tangible Incomes

Section: Ecosystem

Context: The Government announced a new scheme — ‘Mangrove Initiative for Shoreline Habitats & Tangible Incomes’ (MISHTI) in the Union Budget under **which plantation along the coastline will be taken up** for which funds from Mahatma Gandhi National Rural Employment Scheme (MGNREGS) will also be utilised.

More on the News

- Building on India’s success in afforestation, MISHTI will be taken up for mangrove **plantation along the coastline and on salt pan lands**, wherever feasible, through **convergence between MGNREGS, CAMPA Fund**, and other sources.
- The MISHTI comes after India joined the **Mangrove Alliance for Climate** launched during the **27th Conference of Parties (COP27) to the United Nations Framework Convention on Climate Change** held in Egypt in November 2022.
- MISHTI could **potentially attract private resources** and carbon and biodiversity offsets.

Mangroves

- Mangroves cover **only about 0.1 per cent of the planet’s surface**. Yet, they can potentially **store up to 10 times more carbon per hectare** (ha) than terrestrial forests.
- In India, the total **mangrove cover is 4,992 square kilometres**, according to the 2021

Forest Survey Report (FSR).

- These plantations can protect coastal communities by **acting as a natural barrier** against storm surges, cyclonic activity.
- Mangroves are **important nursery and breeding grounds for fish**. Restoration projects worldwide can potentially lure the carbon offset market, which facilitates increased carbon credits trading.
- Threats: human activities such as the **building of roads, railways and infrastructure projects**, as well as **shifting coastlines, coastal erosion** and an increase in storms due to extreme weather events have all taken a toll on them.

4. Natural Farming

Section: Agriculture

Context: Natural farming gets a push with focus on assured input supplies: Budget 2023.

More on the News:

- Over the next three years the government will facilitate **one crore farmers to adopt natural farming** for which Finance Minister unveiled a detailed plan, starting from **increasing production of bio-fertilisers and bio-pesticides**, the major inputs required **to prevent any drop in yield**, as well as a distribution network to ensure their availability.
- The scheme announced by the government could be helpful for those farmers in raising productivity of crops as well as those who want to shift from chemical farming.
- Focus on **regenerative farming will help India move towards reduction in carbon emissions from agriculture**. The focus on integrated nutrient management aligns well with the overall vision of sustainability.

Natural Farming

- It can be defined as a “**chemical- free farming and livestock based**”. Soundly grounded in **agro-ecology**, it is a **diversified farming system that integrates crops, trees and livestock**, allowing the optimum use of functional biodiversity.
- It holds the promise of **enhancing farmers’ income** while delivering many other benefits, such as **restoration of soil fertility and environmental health, and mitigating and/or reducing greenhouse gas emissions**.
- This farming approach was **introduced by Masanobu Fukuoka, a Japanese farmer and philosopher**, in his **1975 book The One-Straw Revolution**.
- It builds on **natural or ecological processes** that exist in or around farms. Internationally, **Natural Farming** is considered a form of **regenerative agriculture**—a prominent strategy to save the planet.
- It has the potential to **manage land practices and sequester carbon** from the atmosphere in soils and plants, where it is actually useful instead of being detrimental.
- In India, Natural farming is promoted as **Bhartiya Prakritik Krishi Paddhati Programme (BPKP) under Paramparagat Krishi Vikas Yojana (PKVY)**.
- **BPKP** is aimed at promoting traditional indigenous practices which reduce externally purchased inputs.
- Natural Farming, as the name suggests, is the art, practice and, increasingly, the science of working with nature to achieve much more with less.

Organic Farming	Natural Farming
In organic farming, organic fertilizers and manures like compost, vermicompost, cow dung manure, etc.	In natural farming, neither chemical nor organic fertilizers are added to the soil. In fact, no external

are used and added to farmlands from external sources.	fertilizers are added to soil or given to plants whatsoever.
Organic farming still requires basic agro practices like plowing, tilling, mixing of manures, weeding, etc. to be performed.	In natural farming, decomposition of organic matter by microbes and earthworms is encouraged right on the soil surface itself, which gradually adds nutrition in the soil, over the period.
Organic farming is still expensive due to the requirement of bulk manures, and it has an ecological impact on surrounding environments; whereas, natural agriculture is an extremely low-cost farming method, completely molding with local biodiversity.	In natural farming there is no plowing, no tilling of soil and no fertilizers, and no weeding is done just the way it would be in natural ecosystems.

5. Regenerative agriculture

- Regenerative agriculture is a system of farming principles and practices that **seek to rehabilitate and enhance the entire ecosystem of the farm** by placing a heavy premium on **soil health** with attention also paid to **water management, fertilizer use**, and more.
- It is a method of farming that **improves the resources it uses**, rather than destroying or depleting them.

Benefits:

- Regenerative agriculture practices **increase soil biodiversity and organic matter**, leading to more **resilient soils** that can better **withstand climate change impacts** like flooding and drought.
- Healthy soils lead to **strong yields and nutrient-rich crops**.
- It also **diminishes erosion and runoff**, leading to **improved water quality** on and off the farm.
- Importantly, regenerative agriculture practices also **help fight the climate crisis** by **pulling carbon from the atmosphere and sequestering it in the ground**.

6. Biodynamic farming

Section :Agriculture

- **Biodynamic agriculture** is a form of alternative agriculture based on **pseudo-scientific and esoteric concepts** initially developed in **1924** by **Rudolf Steiner** (1861–1925).
- It was the **first of the organic farming movements**.
- It treats **soil fertility, plant growth, and livestock care** as ecologically interrelated tasks, emphasizing spiritual and mystical perspectives.
- It emphasizes the **use of manures and composts** and **excludes the use of synthetic (artificial) fertilizers, pesticides and herbicides on soil and plants**.
- Methods unique to the biodynamic approach include its **treatment of animals, crops, and soil** as a single system, an emphasis from its beginnings on local production and distribution systems, its **use of traditional and development of new local breeds and varieties**.
- Some methods use an astrological sowing and planting calendar.
- Biodynamic agriculture **uses various herbal and mineral additives for compost additives and field sprays**.
- **No difference in beneficial outcomes** has been scientifically established between certified biodynamic agricultural techniques and similar organic and integrated farming practices. Biodynamic agriculture is a **pseudoscience as it lacks scientific evidence for its efficacy** because of its reliance upon esoteric knowledge and mystical beliefs.
- As of **2020**, biodynamic techniques were **used on 251,842 hectares in 55 countries**, led by Germany, Australia and France.[10] Germany accounts for 41.8% of the global total;[11] the remainder average **1,750 ha per country**.
- Biodynamic methods of cultivating grapevines have been taken up by several notable vineyards.
- There are certification agencies for biodynamic products, most of which are members of the international biodynamics standards group **Demeter International**.

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- ADVANCED LEVEL TEST - 16
- MONTHLY CURRENT AFFAIRS TEST - 15
- ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8
- FULL LENGTH STIMULATED TEST - 10
- C-SAT Test - 10
- TOTAL NO. OF TEST - 70**

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7. Agroecology or Agroecological farming

Section : Agriculture

- Agroecology is the **study of ecological processes applied to agricultural production systems**.
 - Application of **ecological principles to agroecosystems** can help in developing novel management approaches and techniques in agriculture systems.
 - The field of agroecology is not associated with any one particular method of farming, whether it be organic, integrated, or conventional, intensive or extensive. However, it has much more in common with organic and integrated farming.
- **Agroecology is not against the use of technology in agriculture** but assesses how, when, and if technology can be used in conjunction with natural, social and human assets.
 - It recognizes that there is **no universal formula or recipe for the success and maximum well-being of an agroecosystem** and is **context- or site-specific**.
- Agroecology is not defined by certain management practices, instead, it studies questions related to the four system properties of agroecosystems:
 1. **productivity**
 2. **stability**
 3. **sustainability**
 4. **equitability**
- Agroecologists see **all four properties as interconnected and integral to the success of an agroecosystem** and study them through an interdisciplinary lens,
 - **using natural sciences** to understand elements of agroecosystems as well as
 - **using social sciences** to understand the effects of farming practices on rural communities, economic constraints to developing new production methods, or cultural factors determining farming practices.
- Agroecologists do not limit themselves to the study of agroecosystems at any one scale: gene- organism- population- community- ecosystem- landscape- biome, field- farm- community- region- state- country- continent- global.

Benefits of Agroecology-

- Agroecological farming can **double food production within ten years** without harming the environment.
- Agroecology recognizes the **multifunctional dimensions of agriculture** – which not only produces food, jobs and economic well-being but also creates cultural, social and environmental benefits.
- Agroecology also **protects and provides ecosystem services like pollination, natural pest control, nutrient and water cycling and erosion control**.

Agroecological farming has been shown to-

- **Increase ecological resilience**, especially with respect to volatile weather conditions;
- **Improve health and nutrition** through more diverse, nutritious and fresh diets and reduced incidence of pesticide poisonings and pesticide-related diseases;
- **Conserve biodiversity and natural resources** such as soil organic matter, water, crop genetic diversity and natural enemies of pests;
- **Improve economic stability** with more diverse sources of income, the spread of labour needs and production over time, and reduced vulnerability to commodity price swings; and
- **Mitigate effects of climate change** through reduced reliance on fossil fuels and fossil fuel-based agricultural inputs, increased carbon sequestration and water capture in soil.

8. Bid to end tax anomaly between biogas, natural gas to promote green fuel

Section: Climate change

Context: In a bid to clear the tax anomaly between biogas and natural gas when blending for use as auto fuel (compressed natural gas), Finance Minister has proposed **exemption in excise duty on CNG to the extent equal to the GST paid on biogas or compressed biogas**, subject to conditions.

More on the News:

- Currently natural gas falls under the value-added tax (VAT) regime, while biogas attracts GST.
- The Government has been **promoting the use of compressed biogas** as an alternative green transport fuel, which is produced **through anaerobic decomposition** of waste/ biomass sources, including municipal solid waste.
- The Ministry of Petroleum and Natural Gas had launched the ‘Sustainable Alternative Towards Affordable Transportation’ (SATAT) **initiative** on October 1, 2018, aimed at **establishing an eco-system for the production of compressed biogas** from waste/ biomass sources and promote its use along with natural gas.
- Subsequently, the ministry had issued guidelines for co-mingling of domestic gas, for supply through city gas distribution networks, with compressed biogas. However, **due to the tax discrepancy, the blending had not taken off**.
- The Budget has attempted to address the blending issue of CBG in PNG by exempting GST-paid CBG from excise duty in order to **boost green mobility even further**. This also **works as cost rationalisation** for CBG producers.

SATAT Scheme

- It was launched in 2018 by the **Ministry of Petroleum & Natural Gas** in association with Indian Oil Corporation Ltd., Bharat Petroleum Corporation Ltd. and Hindustan Petroleum Corporation Ltd.

- It envisages targeting production of 15 MMT of CBG from 5000 plants by 2023.
- It **aims to set up Compressed Bio-Gas production plants** and make CBG available in the market for use as a green fuel.

Compressed Bio-Gas (CBG)

- Bio-gas is **produced naturally** (through a process of anaerobic decomposition) **from waste / bio-mass sources** like agriculture residue, cattle dung, sugarcane press mud, municipal solid waste, sewage treatment plant waste, etc.
- **After purification**, it is compressed and called CBG, which **has high methane content**.
- It is exactly similar to the commercially available natural gas in its composition and energy potential.
- It can be used as an **alternative, renewable automotive fuel** with similar calorific value and other properties similar to CNG.

9. Economy transitioning to net-zero will require chemical solutions

Section: Climate change

Context: From the chemicals industry perspective, an **economic transition from fossil fuel to sustainable energy** has translated to a **new revenue opportunity** in the past and may most likely continue to support the industry.

More on the News:

- Chemicals' applications in the green transition will be **widely similar to a fossil-based economy**.
- **Electrolytes in batteries, solar films used in solar panels, waste treatment in biogas and biomass, efficient catalysts replacing older chemicals** and environment compliant refrigerants, chemicals are used in most green solutions.
- This should be **beneficial for companies** which have or are developing solutions in such space.
- **Customs duty** for fluorospar, a raw material for fluorochemicals which is used in pharma, agro-chem and new age energy solutions, **has also been reduced from 5 per cent to 2.5 per cent supporting emerging solutions**.
- The Make-in-India push by the government in the electronics segment spells opportunity for chemicals manufacturers supplying to semiconductor industries as well.
- On a broader basis, **net-zero carbon emission by 2070 will involve solutions engineered by chemicals industries** to cap the emissions from industrial processes.

10. UNEP-managed CITES database reveals red sanders smuggling

Section: International conventions

Context: The CITES trade database has **recorded 28 incidents of Red Sanders** confiscation, seizure, and specimen **from the wild being exported from India**, a factsheet prepared by TRAFFIC, a global wildlife trade monitoring organisation has revealed.

Red Sanders:

- **Pterocarpus santalinus**, or red sandalwood, is an **endemic tree species** with distribution restricted to the Eastern Ghats of India.
- They are found in **Tropical Dry Deciduous forest** of the Palakonda and Seshachalam hill ranges of **Andhra Pradesh** and also found in **Tamil Nadu** and Karnataka.
- The species found growing **up to a height of 10 to 15 metres**.
- Red Sanders is a **very slow-growing tree species** that attains maturity in natural forests after 25-40 years.
- Red Sanders usually **grow in the rocky, degraded and fallow lands with Red Soil and hot and dry climate**.
- Under the foreign trade policy of India, **the import of Red Sanders is prohibited**, while export is restricted.
- Red sanders is reported to be **one of India's most exploited tree species**, and is under **severe pressure from illegal logging and harvesting**.
- Its heartwood is in demand in both domestic and international markets and is used to **make furniture and handicrafts**, while the **red dye obtained from the wood is used as a colouring agent** in textiles and medicines.
- **Conservation status**
 - Listed under **Schedule IV of The Wildlife Protection Act**
 - **Endangered** as per **IUCN Red List**
 - Falls in **Appendix II of CITES**.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

- CITES is an international agreement to which States and regional economic integration organizations adhere voluntarily.
- Aim: Ensure that international **trade in specimens of wild animals and plants does not threaten their survival**.
- It was drafted as a **result of a resolution adopted in 1963** at a meeting of members of the **International Union for Conservation of Nature (IUCN)**.
- It provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.
- The CITES Secretariat is **administered by UNEP** (The United Nations Environment Programme) and is located at **Geneva, Switzerland**.
- It plays a **coordinating, advisory and servicing role** in the working of the Convention (CITES).

- The Conference of the Parties to CITES, is the **supreme decision-making body** of the Convention and comprises all its Parties.
- Although CITES is **legally binding on the Parties**, it does not take the place of national laws. Rather, it **provides a framework to be respected by each Party**, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.

Functions

- The CITES works by **subjecting international trade in specimens** of selected species to certain controls.
- **All import, export, re-export and introduction from the sea of species covered by the Convention** has to be authorized through a licensing system.
- Each Party to the Convention must designate one or more Management Authorities in charge of administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species.
- **Appendices I, II and III** to the Convention are lists of species **afforded different levels or types of protection** from over-exploitation.
- **Appendix I**
 - It lists species that are the **most endangered** among CITES-listed animals and plants.
 - They are **threatened with extinction** and CITES **prohibits international trade** in specimens of these **species except when the purpose of the import is not commercial, for instance for scientific research**.
 - In these exceptional cases, trade may take place provided it is **authorized by the granting of both an import permit and an export permit** (or re-export certificate).
- **Appendix II**
 - It lists species that are **not necessarily now threatened with extinction** but that may become so unless trade is closely controlled.
 - International trade in specimens of Appendix-II species may be authorized by the granting of an export permit or re-export certificate.
 - **No import permit is necessary** for these species under CITES (although a permit is needed in some countries that have taken stricter measures than CITES requires).
- **Appendix III**
 - It is a list of species **included at the request of a Party that already regulates trade** in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation.
 - International trade in specimens of species listed in this Appendix is allowed **only on presentation of the appropriate permits or certificates**.

TRAFFIC (Trade Records Analysis of Flora and Fauna in Commerce)

- TRAFFIC is a **leading non-governmental organisation** working globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.
- It is a **joint program of WWF and IUCN**.
- TRAFFIC works to ensure that **trade in wild plants and animals is not a threat to the conservation of nature**.
- TRAFFIC has gained its **greatest reputation from supporting CITES**, the Convention on International Trade in Endangered Species.
- TRAFFIC focuses on leveraging resources, expertise and awareness of the latest globally urgent species trade issues such as tiger parts, elephant ivory and rhino horn.
- Large scale commercial trade in **commodities like timber and fisheries products are also addressed** and linked to work on developing rapid results and policy improvements.

11. World Wetlands Day: In Andhra Pradesh, efforts on to save a unique wetland near Visakhapatnam

Section :Places in news

Context: The State Forest Department, in association with environmental groups, are taking steps to **preserve Kondakarlava wetland**, the second largest freshwater lake of Andhra Pradesh.

More on the News:

- A group of environmentalists documented four smooth-coated otters in the Kondakarlava wetland in 2021.
- This was the first documented record of the smooth-coated otters.

World Wetlands Day

- World Wetlands Day is celebrated on **2nd February annually** to mark the adoption of the **Convention on Wetlands on February 2nd 1971**.
- It is celebrated to **raise awareness among all sections** of the society about values and functions of wetlands, utilization of their resources and their environmental importance.

- The theme for 2023 is ‘**Wetland restoration**’ – This year’s theme highlights the urgent **need to prioritize wetland restoration**, and calls on an entire generation to take steps to revive and restore degraded wetlands. The theme builds on – and contributes to the **efforts to heal the planet as championed** by the UN Decade on Ecosystem Restoration.

Kondakarla Ava lake

- Kondakarlava is located about 48 kilometres from
- It is the **second largest freshwater wetland of Andhra Pradesh**, yet to be declared as a protected site.
- Spread across 750 acres, it is host to over **150 species of birds** and has a rich biodiversity with a range of fish, aquatic, animal and plant species.
- The Sanctuary comprises a unique and **endangered forest type and the wet evergreen forests**. It is recognized as an Eco Tourism destination.

Smooth-coated otter

- The smooth-coated otter is an otter species **occurring in most of the Indian subcontinent and Southeast Asia**, with a disjunct population in Iraq.
- It is listed as **Vulnerable on the IUCN Red List**.
- Smooth-coated otter is characterized by a very smooth, sleek pelage.
- These otters have generally been described as **fish specialist**. They are **strong swimmers and hunt in groups**. When fishing they travel in a V-formation going upstream.
- Their numbers are said to be **declining with few breeding populations** reported from Corbett and Dudhwa Tiger Reserves and Katarniaghat Wildlife Sanctuary in the north, Kaziranga National Park in the northeast, Sunderbans, Bhitarkanika and Coringa in the eastern coast; and Periyar Tiger Reserve and the Nagarhole National Park in the south.
- **Major threats** to Asian otter population are **loss of wetland habitats** due to construction of large scale hydroelectric projects, **conversion of wetlands for settlements** and agriculture, reduction in prey biomass, **poaching and contamination** of waterways by pesticides.

12. Asiatic black bears

Section: Species in news

Context: The Kashmir Valley has bucked the trend of Asiatic black bear (*Ursus thibetanus*) attacks on humans rarely reported throughout the animal’s global range.

More on the News:

- The **conversion of the bear’s natural habitat to orchards and farmlands** is the primary reason for the ursine attacks over the past 30 years.
- Other reasons include the **India-Pakistan border fencing** which blocks the movement of the animal and a new generation of people who are not familiar with co-existing with large predators.
- Study recorded **2,357 Asiatic black bear attacks** in the Valley between 2000 and 2020. A total of 2,243 attacks or 95.2% of the cases resulted in injury and 114 attacks or 4.8% of cases in death.

Asiatic Black Bears

- The Asiatic black bear is one of eight extant species of the bear family.
- It is a **medium-sized bear species** native to Asia that is largely adapted to an **arboreal lifestyle**.
- It is spread across **Asia, from the Himalayas to the Russian Far East**.
- It has been categorised as **Vulnerable** under the International Union for Conservation of Nature’s Red List of Threatened Species and is also listed under **Appendix I of CITES** and **Schedule I** of the Wildlife (Protection) Act, 1972.
- The bears are found in 83 protected areas of India, **spread across five states and 2 Union Territories in the Himalayas**
- It is **one of the large carnivore species** having negative interactions with humans in the Indian Himalayas.
- Till now, methods used to determine the population status of Asiatic black bears in India have been **limited to questionnaires, sign surveys and genetic sampling** using hair samples.

13. Soil organic carbon

Section : Climate change

Context: Soil Organic Carbon (SOC) as an **indicator for land and soil degradation**, is becoming central to climate change mitigation attempts.

More on the News:

- The UN climate conference of 2022 also witnessed calls for **integrating soil health and specifically soil organic carbon (SOC)** in the Nationally Determined Contributions (NDCs).
- This gains significance, in the background that several IPCC reports have demonstrated the **potential of land-based mitigations** in the NDCs under the Paris Agreement.

- SOC pool is one of the most important carbon stocks on the earth which contains approximately **twice as much carbon as in the atmosphere**.
- SOC stock is also proposed as a **globally relevant indicator within the monitoring framework for land and soil degradation** in the UN Sustainable Development Goals (SDGs).
- SOC management on croplands and grasslands are estimated to have the greatest mitigation potential at USD20 tCO₂-eq-1
- India with 162 million hectares (Mha) of arable land and 8 Mha of permanent crop land which is about **12% and 6%** of the respective global figures, has a **huge potential for integrating SOC in its national mitigation strategies**.
- In this context, it is important to investigate the relevance of making **SOC, as a central indicator in soil health measurements**.
- **Soil microbial load is a relatively stable measure of soil health**. Soil microbe species diversity and activity are responsible for various ecosystem services. The higher the microbial load in the soil, **higher is the aerobic activity and better the soil health and SOC**.

Soil Organic Carbon

- Soil organic carbon (SOC) comes from plants, animals, microbes, leaves and wood, mostly found in the first metre or so.
- Soil organic carbon is a **measurable component of soil organic matter**. Organic matter makes up **just 2–10% of most soil's mass** and has an important role in the physical, chemical and biological function of agricultural soils.
- Organic matter contributes to **nutrient retention** and turnover, **soil structure, moisture retention and availability**, degradation of pollutants, and carbon sequestration.
- **Soil organic matter** is composed mainly of **carbon, hydrogen and oxygen**, and has small amounts of other elements, such as nitrogen, phosphorous, sulfur, potassium, calcium and magnesium contained in organic residues.
- It is **divided into 'living' and 'dead'** components and can range from very recent inputs, such as stubble, to largely decayed materials that might be many hundreds of years old. About 10% of below-ground SOM, such as roots, fauna and microorganisms, is 'living'.

14. The union budget's environmental hits and misses

Section: Government schemes

Context: Union Minister of Finance reiterated 'green' 23 times and 'sustainable' nine times in her budget speech on February 1. FM pegged 'green growth' as one among four opportunities that can be transformative during Amrit Kaal.

More on the Environment Budget:

- Green growth, which is economic growth that is environmentally sustainable, was announced as one of seven priorities for the government in the 2023-24 union budget released yesterday.
- One of the major announcements the finance minister made was a **capital investment of Rs. 35,000 crores (Rs. 350 billion) towards energy transition**. The funds, though, would go to the Ministry of Petroleum and Natural Gas. Of this, Rs 30,000 crores (Rs. 300 billion) will go to oil-marketing companies (OMCs), and the remaining Rs. 5,000 crores (Rs. 50 billion), will be spent on strategic petroleum reserves.
- The minister's other big announcements related to the environment were the **viability funding gap for battery energy storage system**, inter-state transmission system for evacuation and **grid integration of renewable energy** from Ladakh, **500 new 'waste-to-wealth' plants**, and Rs. 19,700 crores (Rs. 197 billion) for the **National Green Hydrogen Mission**.
- The union minister also announced the **extension of customs duty exemption on the import of capital goods and equipment needed to produce lithium-ion cells** for use in electric vehicle batteries.
- The finance minister announced a **Green Credit Programme** to incentivise environmentally sustainable and responsive actions by companies, individuals, and local bodies.
- The union minister said that the government would promote **wetland conservation with the help of local communities through Amrit Dharohar**, a scheme to protect vital wetlands through optimal use for sustaining aquatic biodiversity.
- Similarly, FM announced a new scheme named **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)**, for mangrove plantation along the coastline and on salt pans.
- FM announced a scheme named **PM PRANAM (Programme for Restoration, Awareness, Nourishment, and Amelioration of Mother Earth)** which will incentivise states and Union Territories to **promote alternative fertilisers and balanced use of chemical fertilisers**.

15. Study Mussoorie's specific carrying capacity, govt told

Section: Ecosystem

Concept:

- Taking suo motu cognizance of a newspaper report that has warned of a Joshimath like situation in Mussoorie town, the **National Green Tribunal (NGT)** has issued directions to the Uttarakhand government to **conduct a study of the specific carrying capacity of the hill station**.

- The green court has also formed a nine member committee to suggest remedial measures for preventing environmental damage to the town, one of the most visited tourist destinations in the State.

What is Carrying Capacity?

- Carrying capacity is the **maximum population size that an ecosystem can sustainably support** without degrading the ecosystem.
- In the broader sense, carrying capacity also means that all plants and animals which an area of the Earth can support at once.
- **Change in carrying capacity for one species affects other populations** in the area.
- Deaths and long-term damage to an ecosystem occurs when a population exceeds the carrying capacity of its ecosystem.
- Disease, competition, predator-prey interaction, resource use and the number of populations in an ecosystem all affect carrying capacity.

Carrying Capacity and Sustainable Development

- Our Common Future, also known as the Brundtland Report, 1987 defines Sustainable Development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
- The **idea of sustainability presupposes development within the confines of carrying capacity** of ecosystems.

16. Amazon deforestation heats up Tibet, says new study

Context: There are no borders in the fight against climate change, cooperation is the key, says study published in Nature.

More on the News:

- Deforestation in the Amazon rainforest **can directly influence temperatures in Tibet**, which is more than 15,000 kilometres away from the tropical biome, according to a new report.
- **Even modest, incremental changes in this biome might eventually result in massive, abrupt and permanent changes** to the planet.
- **Logging, road construction, and warming** are already today stressing the Amazon rainforest, and will likely do so even more in the future — and while the Amazon region is, of course, an important Earth system element by itself.
- These are **tagged ‘tipping elements’** and have certain temperature thresholds, or tipping points, beyond which even a slight change **may lead to irreparable and catastrophic consequences on our plane**
- Proposing a climate network approach to analyse the global impacts of a prominent tipping element, they concluded that the **harsh and warmer temperatures in the Amazon correlated with rising temperatures in Tibet and the West Antarctic ice sheet.**
- They have evidence that when it rained more in the Amazon, the other two regions were prone to receive less precipitation. The paper also highlighted that the snow cover on the Tibetan Plateau has been on a decline since 2008.

About Amazon Rainforest:

- Comprising about 40% of Brazil’s total area, it is bounded by the Guiana Highlands to the north, the Andes Mountains to the west, the Brazilian central plateau to the south, and the Atlantic Ocean to the east.
- These are large tropical rainforest occupying the drainage basin of the **Amazon River and its tributaries in northern South America** and covering an area of 6,000,000 square km.
- Tropical forests are closed-canopy forests growing within 28 degrees north or south of the equator.
- They are very wet places, receiving more than 200 cm rainfall per year, either seasonally or throughout the year.
- Temperatures are uniformly high – between 20°C and 35°C.



17. Budget push for Mangroves

Section: Ecosystem

Concept:

- The Union Budget for 2023-24 has proposed Mangrove plantation along the coastline and on saltpan lands under MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes).

Background

- According to the 'State of World Mangroves 2022' report by the Global Mangrove Alliance, the total mangrove cover of the world is around 147000 sq km (14.7 million hectares).
- As per the Indian State of Forest Report (ISFR) 2021, India has nearly 4992 sq km (0.49 million hectares) of mangroves.
- In India, Mangroves are distributed across 9 States and 3 Union Territories with West Bengal having the highest mangrove cover of 2114 sq km.
- The ISFR report also showed that the mangrove cover in India has increased from 4046 sq km in 1987 to 4992 sq km in 2021.

Mangrove plantation initiative:

- MISHTI will be implemented through the convergence of various schemes** like MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme), CAMPA (Compensatory Afforestation Fund Management and Planning Authority) Fund, and other sources.
- It would further require extensive cooperation from local communities.
- It is found that the survival rate of mangrove seed plantation and saplings is 50% and 60% respectively.
- Moreover, it takes **three years for a new plant to stabilize**.
- Thus a contract-based one-time plantation under MGNREGS and CAMPA might not work efficiently without the local communities taking ownership of the forests.
- Moreover, **MISHTI is in line with India's Nationally Determined Contributions of creating an additional carbon sink of 2.5-3 billion tonnes of carbon dioxide (CO₂) equivalent by 2030.**
- Additionally, India also joined the **Mangrove Alliance for Climate at COP27**.

Mangrove Alliance for Climate (MAC)

- It includes **UAE, Indonesia, India, Sri Lanka, Australia, Japan, and Spain**.
- It seeks to educate and spread awareness worldwide on the role of mangroves in curbing global warming and its potential as a solution for climate change.
- However, the **intergovernmental alliance works on a voluntary basis** which means that there are no real checks and balances to hold members accountable.
- Instead, the parties will decide their own commitments and deadlines regarding planting and restoring mangroves.

- The members will also share expertise and support each other in researching, managing and protecting coastal areas.

Mangroves

- Mangroves are defined as **assemblages of salt tolerant trees and shrubs** that grow in the **intertidal regions** of the tropical and subtropical coastlines.
- They grow luxuriantly in the places where freshwater mixes with seawater and where sediment is composed of accumulated deposits of mud.
- Tree species in mangrove forests/ecosystems are categorized into:
- **True mangroves:** They display morphological adaptations like **pneumatophores, vivipary or crypto vivipary germination, and salt-secreting cell**. There are 42 true mangrove species in India.
- **Mangroves associates:** The species that exist side by side with the true mangroves. There are 68 mangrove associate species in India.

Features:

- **Saline Environment:** They can survive under extreme hostile environments such as high salt and low oxygen conditions.
- **Low oxygen:** Underground tissue of any plant needs oxygen for respiration. But in a mangrove environment, the oxygen in soil is limited or nil.
- For the purpose of breathing, they develop special roots called pneumatophores.
- **Survival in Extreme Conditions:** With their roots submerged in water, mangrove trees thrive in hot, muddy, salty conditions that would quickly kill most plants.
- **Viviparous:** Their seeds germinate while still attached to the parent tree. Once germinated, the seedling grows into a propagule.
- A propagule is a vegetative structure that can become detached from a plant and give rise to a new plant. Examples include a bud, sucker, or spore.

Significance:

- Mangroves trap and cycle various organic materials, chemical elements, and important nutrients in the coastal ecosystem.
- They provide one of the basic food chain resources for marine organisms.
- They provide physical habitat and nursery grounds for a wide variety of marine organisms, many of which have important recreational or commercial value.
- Mangroves also serve as storm buffers by reducing wind and wave action in shallow shoreline areas.

Indian Mangrove Cover:

- **India's contribution is 45.8% total mangrove cover in South Asia.**
- According to the Indian State Forest Report 2021, Mangrove cover in India is 4992 sq. Km which is 0.15% of the country's total geographical area.
- **Largest Mangrove Forest: Sundarbans in West Bengal** are the largest mangrove forest regions in the world. It is listed as a UNESCO World Heritage Site.
- It is followed by **Gujarat and Andaman, and Nicobar Islands.**

18. Great Indian Bustard

Section : Species in news

Concept :

- A Supreme Court appointed committee has recommended that to protect the **endangered great Indian bustard**, close to 800 km of proposed power lines in the Thar and Kutch deserts of Rajasthan and Gujarat should be rerouted or made to go underground.
- This makes up about 10% of the length of the lines. However, no significant steps appear to have been taken by power companies and State governments to comply with them.
- The 7,200 km of over_headlines are meant to transfer solar power into the grid, but existing lines have been harming the birds, which have been dying in collision with the lines or from electrocution.
- Only some **150 of these birds are still left, most of them in Jaisalmer of Rajasthan.**

Great Indian Bustard

- One of the heaviest flying birds **endemic to the Indian subcontinent.**
- **State Bird of Rajasthan.**

Habitat:

- Untamed, Arid grasslands.
- Among the heaviest birds with flight, GIBs prefer grasslands as their habitats
- A Maximum number of GIBs were found in **Jaisalmer** and the Indian Army-controlled field firing range near Pokhran, Rajasthan.

- Other areas: **Gujarat, Maharashtra, Karnataka and Andhra Pradesh.**

Population:

- As per the studies conducted by the Wildlife Institute of India, there are around 150 Great Indian Bustards left across the country which includes about 128 birds in Rajasthan and less than 10 birds each in the States of Gujarat, Maharashtra, Andhra Pradesh and Karnataka.
- While the GIBs' historic range included much of the Indian sub-continent, it has now shrunk to just 10 per cent of that.

Protection Status:

- IUCN Status: **Critically Endangered.**
- Listed in Wildlife Protection Act's Schedule 1.
- **Significance of GIBs in the ecosystem-**
- Terrestrial birds spend most of their time on the ground, feeding on insects, lizards, grass seeds, etc. GIBs are considered the flagship bird species of grassland and hence **barometers of the health of grassland ecosystems.**

Why is the Great Indian Bustard endangered?

- Among the biggest threats to the GIBs are overhead **power transmission lines.**
- Due to their **poor frontal vision, the birds can't spot the power lines from a distance**, and are too heavy to change course when close. Thus, they collide with the cables and die.
- According to the Wildlife Institute of India (WII), in Rajasthan, 18 GIBs die every year after colliding with overhead power lines.

Great Indian Bustard: Conservation efforts

- The **Supreme Court in April 2021** ordered that all overhead power transmission lines in core and potential GIB habitats in Rajasthan and Gujarat should be made underground.
- Supreme court has suggested the installation of bird diverters (reflector-like structures strung on power cables) in priority areas.
- It also asked them to assess the total length of transmission lines that need to go underground in the two states.
- In 2015, the Centre launched the GIB species recovery programme. Under this, the WII and Rajasthan forest department jointly set up breeding centres where GIB eggs harvested from the wild were incubated artificially.

19. Climate change will increase hydropower generation in India

Section : Climate change

Context:

- A two-member team from **IIT Gandhinagar** studied the hydroclimatic changes in the catchment areas and their implications for hydropower generation in 46 major dams located in north, central and south India.

Details:

- The team looked at the increase in rainfall in the catchment areas and the resultant inflow into all **46 major reservoirs** and found that they are characterised by high radiative forcing by the end of the 21st century.

Projected increase:

- Under a **warmer climate**, the **hydropower production** will increase across the country due to a **substantial increase in precipitation** leading to increased inflow to the reservoirs.
- The projected increase in hydropower potential in India is **10-23%.**

Affected regions:

- Compared with **central and south India**, **north India** is projected to experience higher warming in the future.
 - As per the study, the **highest warming** (about 5 degree C) is projected for north India, while the warming is projected to be around **3-4 degree C for central and south India.**
 - The study found that inflow to a few dams in **Ganga, Mahanadi, Brahmani, and west-coast river basins** is **projected to decline** in the future. This reduction in inflow is **due to increase in atmospheric water demands** in response to the considerable warming compared to increase in precipitation.
- The **potential hydropower generation** is projected to **rise by more than 50%** in **Tehri, Ramganga, Kadana, Omkareshwar, Maheshwar, and Sriramsagar dams.**
- In the case of **south India**, eight out of eleven dams are projected to experience a **decline in hydropower potential.**
- **Dams in central India** are projected to experience a more substantial increase in hydropower generation than north and central India.

Reasons include:

- Global warming led the rise in extreme inflow and high reservoir storage conditions.
- Increased precipitation and increased rate of glacier melting.

Significance of hydropower for India:

- Unlike **coal-powered power plants**, hydropower, which is the **second highest power-producing source** at **13%**, is a significant contributor to clean global electricity generation.
- Hydropower generation will play a crucial role in achieving the target of Net-zero by 2070, and goals under the Global diversity framework.
- Hydropower generation is crucial to carbon emission reduction in India.
- HPP is crucial for the 'phase down' of thermal power plants.

20. India budgets for mangroves and wetlands

Context: India's 2023-24 budget announces new schemes for mangroves and wetlands.

More on the News:

- India's finance minister has announced two major programmes – **MISHTI, Amrit Dharohar** for mangrove plantation and wetlands conservation in the country's latest annual budget.

MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes)

- MISHTI is a new programme that will **facilitate mangrove plantations along India's coastline and on salt pan lands**.
- It will aim at the **intensive afforestation** of coastal mangrove forests.
- The programme will **operate through convergence between MGNREGS, CAMPA Fund and other sources**.

Amrit Dharohar Scheme:

- The Amrit Dharohar scheme will be implemented over the next three years to encourage optimal use of wetlands, and enhance biodiversity, carbon stock, eco-tourism opportunities and income generation for local communities.
- The scheme will **emphasize on the importance of wetlands and their preservation** with an outlook that is inclusive of local communities as caretakers of the ecosystem.

21. Mission Sahbhagita

Section : Ecosystem

- The Ministry of Environment, Forest and Climate Change (MoEFCC) launched Mission Sahbhagita in 2022
- A mission of 'a healthy and effectively managed network of 75 wetlands of national and international significance which support water and food security; buffer from floods, droughts, cyclones and other extreme events; employment generation; conservation of species of local, national and international significance; climate change mitigation and adaptation actions; and recognition, conservation and celebration of cultural heritage.'

22. Delhi Cabinet likely to approve ₹2,000-crore project to tackle air pollution

Section Air Pollution

Context: Delhi government will outsource the operations and management of these machines.

More on the News:

- The Delhi Cabinet is likely to approve a proposal to **outsource the operations and management of 70 mechanical road sweepers**, 210 water sprinklers and around 250 integrated water sprinklers-cum-anti-smog guns to a private company instead of purchasing them.
- Mechanical road sweepers and sprinklers are believed to be **more effective than manual sweeping in reducing dust pollution**.
- Anti-smog guns help **reduce air pollution by spraying nebulised water droplets** through high-pressure propellers. The sprayed water increases the mass of air-borne particles and brings them down to the ground.
- Integrated sprinklers-cum-anti-smog-guns will be **mounted on trucks** that will also be fitted with water tanks.

23. About Just Energy Transition Partnership (JETP)

Section: Climate change

- Just Energy Transition Partnership (JETP) is emerging as the key mechanism for multilateral financing by developed countries to support an energy transition in developing countries. This has taken on particular significance following the insertion of the phrase 'phase-down' of coal in the Glasgow Pact. After South Africa, Indonesia, and Vietnam, India is considered the next candidate for a JET Partnership
- JETP is an initiative of the rich nations to **accelerate the phasing out of coal and reducing emissions**.
- The JETP initiative is modelled for South Africa, to support South Africa's decarbonisation efforts.
- It aims to reduce emissions in the energy sector and accelerate the **coal phase-out process**.
- **JETP makes various funding options** available for this purpose in identified developing countries.
- The **JETP was launched at the COP26 in Glasgow** with the support of the **United Kingdom (UK), the United States (US), France, Germany, and the European Union (EU)**
- Following that **G7** has announced for a similar partnership in **India, Indonesia, Senegal, and Vietnam**.

24. Green Deal Industrial Plan

Section: Climate Change

Context: In a bid to support and expand its green industry, the European Union on February 1 revealed the “Green Deal Industrial Plan” that aims to cut red tape and provide massive subsidies.

Concept:

‘Green Deal Industrial Plan’ oversees trade policy of the EU, the proposal involves building a simpler regulatory framework, providing faster access to funds, enhancing skills and improving the EU’s trade network.

Features

1. Simpler regulatory framework:

- A “**Net-Zero Industry Act**”, which will not only simplify rules but also speed up the issuance of permits for green projects, such as renewable energy generation arrays, carbon capture and renewable hydrogen production facilities.
- A “**Critical Raw Materials Act**”, which will provide access to materials like rare earths that are crucial for developing net-zero technology.

2. Providing faster access to funds:

- The state aid **rules will be loosened** in order to help EU’s 27 governments with investing in the clean energy projects.
- The plan allows countries to take money from existing EU funds. It seeks to **direct €250 billion** to serve the green industry from the existing EU money, which is around €800 billion.
- “**European Sovereignty Fund**” in the future to “give a structural answer to the investment needs”

3. Enhancing skills: The plan aims to establish “**Net-Zero Industry Academies**” that will provide up-skilling and re-skilling programmes in strategic industries. As 30 to 40 per cent of the existing jobs might get affected due to green transition, there’s a need for well-paid quality jobs.

4. Improving the trade network: The plan underlines the importance of open trade and seeks to further “develop the EU’s network of **Free Trade Agreements and other forms of cooperation** with partners to support the green transition.”

25. Environmental concerns about Ship dismantling

Section: Pollution

Context: Brazil’s navy planned to scuttle the hull of the decommissioned aircraft carrier Sao Paulo despite protests from Brazil’s environment ministry. The major concern about the aged ship’s sinking is the presence of at least nine tons of asbestos in the hull, along with smaller quantities of other undesirable substances such as oil and chemical coatings.

Concept:

- Globally, about 70 countries have banned the use of asbestos, but those such as the US, India and China have not.
- Despite being banned from ships since 2002, recent estimates indicate that asbestos is “still found in over 65 per cent of vessels, including 50 per cent of all new builds.”

Asbestos contamination:

- Asbestos has been used on ships as both a fire retardant and an insulator to protect sailors from the constant and jarring vibrations of ships’ engines. Asbestos is a silicate compound found naturally in the environment and the mining operations used to extract it from the hills which had a rich source of this compound.
- Asbestos is a strong incombustible fibre which is used for fireproofing and insulation. It also has a very high tensile strength. Consequently, it has umpteen uses — cement roofing sheets and piping and textile and automobile industries.
- It releases from scuttling the ship in the middle of the ocean is likely to release high quantities of asbestos into the water which runs the risk of entering our food cycle.

Other issues

- The presence and removal of plastics, ozone depleting substances, bilge water containing oil, oil sludge, anti-fouling paints, polystyrene, foam, ash, glass, and insulation.
- Waste discharges to the sea and environment surrounding the recycling facility are also potential risks. Dismantling can impact on air, water, and soil quality, therein affecting biodiversity and local ecosystems. And recycling can generate heavy metals and pollutants in cutting areas.

Basel Convention

- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989 by the Conference of Plenipotentiaries in Basel, Switzerland.
- Basel Convention’s thrust at the time of its adoption was to combat the “toxic trade”.
- The Basel Convention, which entered into force in 1992, regulates the international trade of hazardous wastes and is relevant for ship dismantling as a ship usually contains hazardous materials in its structure

NGO Shipbreaking Platform

- The NGO Shipbreaking Platform is a global coalition of organisations working to reverse the environmental harm and human rights abuses caused by current shipbreaking practices and to ensure the safe and environmentally sound dismantling of end-of-life ships worldwide.
- The NGO Shipbreaking Platform is a coalition of environmental, human and labour rights organisations.
- Its goal is to find sustainable solutions that encompass the principles of human rights, corporate accountability, environmental justice, “polluter pays”, producer responsibility and clean production.

26. Huge chunk of plants and animals in U.S. at risk of extinction -report

Section: Biodiversity

Concept:

- A leading conservation research group found that 40% of animals and 34% of plants in the United States are at risk of extinction, while 41% of ecosystems are facing collapse. Everything from crayfish and cacti to freshwater mussels and iconic American species such as the Venus flytrap are in danger of disappearing, a report released on Monday found.

HUMAN ENCROACHMENT

- Among the species at risk of disappearing are icons like the carnivorous Venus flytrap, which is only found in the wild in a few counties of North and South Carolina.
- Nearly half of all cacti species are at risk of extinction, while 200 species of trees, including a maple-leaf oak found in Arkansas, are also at risk of disappearing. Among ecosystems, America’s expansive temperate and boreal grasslands are among the most imperiled, with over half of **78 grassland types at risk of a range-wide collapse**.
- The threats against plants, animals and ecosystems are varied, the report found, but include “habitat degradation and land conversion, invasive species, damming and polluting of rivers, and climate change.”

27. Chilika fishers robbed of livelihood since Cyclone Fani opened new mouths

Section: Places in news

Context: The delicate salinity gradient of the lake disrupted; locals claim Odisha government’s Chilika Development Authority (CDA) not monitoring new mouths regularly.

More on the News:

- The intense storm surge that had accompanied **extremely severe cyclone Fani** in early May 2019 had **opened four new mouths** in the Chilika Lake in Odisha. These were distinct from the main mouth of the lake where it opens into the sea.
- While two of the new mouths closed down in April 2022, two others are still open, affecting the biodiversity of the lake and the livelihoods of the people dependent on it.
- The mouth has moved 2 kilometres northwards since Cyclone Fani made landfall between Chilika Lake and Puri.
- If the new mouths do not close down and sea water continues to enter the lake, it could be disastrous for the ecosystem as the biochemistry of Chilika would change.
- Fish catch has gone down by 30-40 per cent after Cyclone Fani.

Chilika Lake:

- Chilika is **Asia’s largest and world’s second largest lagoon**.
- It lies on the east coast of India in the state of Odisha, separated from the mighty Bay of Bengal by a small strip of sand.
- It spreads over Puri, Khurda and Ganjam districts of Odisha on the east coast of India, at the mouth of the Daya River, flowing into the Bay of Bengal, covering an area of over 1,100 square kilometers.
- It is the largest wintering ground for migratory birds on the Indian sub-continent and is home to a number of threatened species of plants and animals.
- In 1981, **Chilika Lake was designated the first Indian wetland of international importance** under the Ramsar Convention.
- Major attraction at **Chilika is Irrawady dolphins** which are often spotted off Satpada Island.
- The large Nalabana Island (Forest of Reeds) covering about 16 sq km in the lagoon area was declared a bird sanctuary in 1987.

28. Green nod to 87 development projects in 2 years

Section : Environment Laws

Context: From 2020 to 2022, the Ministry of Environment, Forest and Climate Change (MoEFCC) has given clearances to around 87 development projects, with three falling in protected areas.

More on the News:

- Over the last three years (2020-2022), about 31 projects related to highways; 11 projects related to ports; 15 projects related to airports; 20 projects related to river valley and 10 projects related to thermal power plants have been granted environmental clearance by the ministry.

- About **23 lakh trees** have been proposed to be removed for the development of the aforementioned projects. **Compensatory plantation** is carried out as per the extant norms and the same is incorporated as a condition in the respective Environmental Clearance.

Environment Clearance:

- Environmental Clearance is **declared mandatory for both industries and construction-based projects**, which can be already existing or new projects, as per the notification issued by the EIA in 2006, under the authorisation of the Ministry of Environment, Forest and Climate Change along with the implementation of amendments.
- In accordance with the notification issued by the EIA in 2006, there is a list of Industries issued that fall under specific categories.
- The following acts mentioned below govern the issuance of the Clearance –
 - The **Environment (Protection) Act, 1986**
 - The Biological Diversity Act, 2002
 - The National Environmental Tribunal Act, 1995
 - National Green Tribunal Act, 2010
 - The National Environmental Appellate Authority Act, 1997

Requirements of Environmental Clearance

- There are **specific requirements for existing and new projects for issuing a prior Clearance** which is needed to be fulfilled under the concerned regulatory authority personnel based on the type of category –
 - If the project falls under “**Category – A**” of the Schedule, the **regulatory authorised personnel is the Ministry of Environment and Forest**, Central Government.
 - If the project falls under “**Category – B**” of the Schedule, the regulatory authorised personnel is the State Environment Impact Assessment Authority, which is also known as SEIAA.
- Prior to any initiation of construction work, or any initiation of other activity by the Project Management, with the **exception of securing the land**, the **following requirements need to be mandatorily informed** to the authorised personnel –
 - **All the activities need to be listed in the Schedule** in accordance with the notification issued by the EIA in 2006.
 - The **expansion and development of the existing projects that are listed in the Schedule** in accordance with the notification through the accumulation of capacities beyond the limits that are specified.
 - **Any changes made to the product type from an existing producing unit** included in the schedule that is beyond the specific range.

About EIA

EIA is the management tool for identifying environmental, social and economic impacts of a project before decision-making. Thus, it seeks to ensure optimal use of natural resources within the context of sustainable development. **EIA and INDIA:** EIA started in **India in 1978-79** in case of river valley projects. But now it has expanded to include industries, mining sector, thermal power plants etc. Under the Environment Protection Act (EPA), 1986 it has been made mandatory for 29 categories of project involving investment of Rs 50 crore and above.

What are the Steps involved in the EIA?

1. **Screening:** It seeks to determine if a project needs a full EIA or partial EIA based on investment, location or type of development.
2. **Scoping:** Identify potential impacts based on legislative, international standards to identify alternative options (or even not going ahead with project) to compensate for adverse impact on biodiversity and determines terms of reference for EIA.
3. **Baseline data collection:** on site existing environmental status is collected.
4. **Impact prediction:** All aspects of possible impact on environment (air, water, soil, biodiversity etc), socio-economic status of the people in region.
5. **Reporting the EIA report** with mitigation measures, compensations for probable loss.
6. **Public hearing:** As per the EPA, 1986 public hearing is mandatory and any one likely to be impacted by the project must be given opportunity to give an oral/written answer to the state Pollution Control Board.
7. **Environment Management Plan (EMP) and Decision making:** Based on all the above factors in earlier stages an EMP has to be prepared. Then, project proponents and the impact assessment authority make decision on future course of project based on EIA report and EMP.

8. **Monitoring, compliance, enforcing and environmental auditing of EIA and EMP terms both during implementation and in operation phase.**

How does EIA help?

- Prevents project approval and implementation without oversight i.e. **precautionary principle** would have prevented fire at Oil India Limited in Assam this year if process was followed before environment clearance.
- **Sustainable development** by taking adverse consequences in account. Ex- POSCO didn't get clearance in Niyamgiri hills as 12 village council denied clearance to it
- **Compares different alternatives with decision on the best** of economic and environmental goals.
- **Promotes innovation and technology** to best suit the EIA norms and addressing challenges.

What is the EIA cycle proposed in EIA notification, 2006? It talks of 4-stages of EIA to be followed in accordance with the norms. These are:

- **Screening**
- **Scoping**
- **Public hearing**
- **Appraisal**

It also talks of category of projects: Category A and Category B (B1 and B2 projects). In this category A and category B1 projects need mandatory EIA and B2 category does need EIA.

Category A projects are appraised at the national level by the Impact Assessment Agency and the Expert Appraisal Committee (EAC).

Category B projects are appraised at the state level with B1 needing EIA and B2 does not need it. State Level Environment Impact Assessment Authority (SEIAA) and the state level EAC are provided for clearance of the category B projects

About CAMPA

- Whenever forest land is diverted for non-forest purposes, it is **mandatory under the Forest (Conservation) Act, 1980 that an equivalent area of non-forest land has to be taken up for compensatory afforestation.**
- In addition to this, funds for raising the forest are also to be imposed on whomsoever is undertaking the diversion. The land chosen for afforestation, if viable, must be in close proximity of reserved or protected forest for ease of management by forest department.
- In 2002, the **Supreme Court (SC) ordered that a Compensatory Afforestation Fund** had to be created in which all the contributions towards **compensatory afforestation and net present value of land had to be deposited.**
- In April 2004, Ministry of Environment and Forests **constituted Compensatory Afforestation Fund Management and Planning Authority (CAMPA)** to overlook and manage the Compensatory Afforestation Fund (CAF) as directed by the SC. The authority was termed as the 'custodian' of the fund.
- Further in 2009, the government ordered that **State CAMPAs had to be set up** to boost compensatory afforestation at state level and also manage Green India Fund.
- Despite all these efforts, CAG report in 2013 revealed that the **CAMPA funds remained unutilised.** The report stated that between 2006 and 2012, CAF with ad hoc CAMPA grew from ₹ 1,200 crores to ₹ 23,607 crores.

Statutory backing

- **Compensatory Afforestation Fund Act, 2016 came into force from 2018.** The Act established a **National Compensatory Afforestation Fund** under the **Public Account of India** and State Compensatory Afforestation Fund under the Public Account of each state.

- The payments made for compensatory afforestation, net present value and others related to the project will be deposited in the fund.
- The **State Funds will receive 90% of the payments while National Fund will receive remaining 10%.** These funds will be regulated by State and National CAMPA.
- The Ministry also stressed that the **fund had to be used for important needs such as Compensatory Afforestation, Catchment Area Treatment, Wildlife Management,** Assisted Natural Regeneration, **Forest Fire Prevention** and Control Operations, Soil and Moisture Conservation Works in the forest, Improvement of Wildlife Habitat, Management of Biological Diversity and Biological Resources, **Research in Forestry and Monitoring of CAMPA works and others**

29. Keoladeo National Park

Section: Places in news

Context: The Rajasthan state Forest Department has proposed to construct a zoo inside Keoladeo National Park, a World Heritage Site popularly known as Bharatpur bird sanctuary, to display a range of wetland species, including rhinos, water buffaloes, crocs, dolphins and exotic species.

Concept:

The purpose of this zoo, called Wetland ex-situ Conservation Establishment (WESCE):

- To rejuvenate the bio-diversity of Keoladeo National Park, thereby boosting its outstanding universal values.
- A breeding and re-introduction centre for locally extinct species, such as otters, fishing cats, blackbucks, hog deer, etc, “with collateral provision as exhibits for tourists
- An aquarium for indigenous species like Gangetic Dolphin, rocodiles; enclosures for the display of large wetland species like Indian Rhino, Water Buffalo, Barasingha (swamp deer); an aviary, a reptile house and a veterinary care facility; and an integrated administrative block

The Rs 15-crore WESCE plan for Bharatpur is part of the ambitious Rajasthan Forestry and Biodiversity Development Project for which **Agence Française de Développement (AFD)**, the overseas development arm of the French government, has agreed to fund up to Rs 1,200 crore over eight years.

National park	Location	Water source	Vegetation	Species	Special features
Keoladeo National Park (Formerly known as the Bharatpur Bird Sanctuary)	Bharatpur district, the eastern part of Rajasthan	Gambhir and Banganga rivers, an artificial dam called Ajan Bund, to the south of the park.	Tropical dry deciduous forests intermixed with dry grasslands	<p>Animals like the Jackal, Bengal Fox, blackbuck, Chital, common palm civet, hog deer, sambar.</p> <p>The most common waterfowl are gadwall, shoveler, teals, tufted duck, painted stork, white spoonbill, darter warblers, babblers, bee – eater.</p> <p>Threatened avifauna species are also found, including Dalmatian pelican, spot–billed pelican, lesser and greater adjutants, Baer’s pochard,</p>	<p>Declared as bird sanctuary on 13 March 1956 and a National Park in 1982, was included in the World Heritage List in 1985. It was also notified as Ramsar Site in October 1981.</p> <p>A man-made and man-managed wetland</p> <p>It is a reserve forest under the Rajasthan Forest Act, 1953.</p> <p>A wintering ground in India of the western population of Siberian crane <i>Grus leucogeranus</i></p>

30. Amend / Withdraw Norms to Set Up Zoos, Safaris Within Wildlife Sanctuaries

Section: Environment laws

Context: A Supreme Court-constituted panel has asked the Union Environment Ministry to amend or withdraw the guidelines related to setting up zoos and safaris within tiger reserves and wildlife sanctuaries to **discourage the use of wildlife habitats for tourism activities which are non-site specific.**

More on the News:

- Central Empowered Committee (CEC) also said that approvals given for setting up zoos and safaris within tiger reserves and protected areas should be withdrawn forthwith.
- Permission can **only be given for activities involving rescue and rehabilitation** of injured or incapacitated animals from the same landscape.
- According to the National Tiger Conservation Authority (NTCA) guidelines issued in 2012 and amended in 2016 and 2019, **tiger safaris can be established in buffer and fringe areas of tiger reserves** to “reduce pressure of tourism on core and critical tiger habitats and to foster awareness for eliciting public support”. It is therefore imperative that the guidelines issued in 2012, 2016 and 2019 in this regard are amended/withdrawn.
- The establishment of zoos over forest areas should **not be considered a non-forest activity**, doing away with the need for approval **under the Forest (Conservation) Act, 1980**. Only in exceptional cases, the **fringes of the buffer zone of protected areas may be considered for the construction of a zoo** on forest land.
- The Central Zoo Authority (CZA) also should **not consider and approve the establishment of zoos and safaris** within **tiger reserves, wildlife sanctuaries, national parks, along animal corridors and animal dispersal routes**.
- The location of such safaris and zoos shall **not endanger the life of the natural population** and eco-tourism, and wildlife education should **not be at the cost of survival of the endangered species**. It should also not result in shrinkage of the already limited habitat available to such endangered species.
- It is a well-accepted fact that **zoo animals often harbour deadly diseases** and are also a source of transmission of diseases to wild animals despite the stringent conditions imposed by the CZA. Keeping in view the precautionary principles, **setting up zoos and safaris within wild animal habitats is best avoided.**

Guidelines to Establish Tiger Safari in Buffer and Fringe Areas of Tiger Reserves

- **Tiger Safari** may be considered for establishment in the **buffer and fringe areas of tiger reserves** to reduce pressure of tourism from core/critical tiger habitats and **to foster awareness for eliciting public support**.
- These guidelines apply to those **tiger reserves which experience 100% utilization of their carrying capacity** in the core/critical habitat.
- The **Field Director** shall be overall responsible for establishment, management and administration of the tiger safari with inputs from the Local Advisory Committee (LAC). The **overall responsibility** of the Tiger Safari at the State level would rest with the **Chief Wildlife Warden of the concerned State** along with **oversight of the National Tiger Conservation Authority and the Central Zoo Authority, New Delhi**.
- The selection of the animal shall be done in conformity of section 38 I of Wildlife (Protection) Act, 1972 after due approval of the Central Zoo Authority (CZA).
- **Criteria and procedure for establishment of a Tiger Safari:**
 - **Tiger dispersal routes shall be avoided** in all circumstances
 - The **area of a Safari Park** may be as large as possible, however, minimum area of a safari for tigers **should be 40 hectares**, extendable as per requirements. It must be ensured that the biological requirements of the animals kept therein are fully met. **Clearances under the Forest (Conservation) Act, 1980**, shall be taken wherever applicable.
 - The **topography** for the safari should **be undulating and well drained**, without steep slopes
 - The **vegetation** maintained in the Safari Park should be of an **indigenous nature**. The density should be regulated according to needs, and to provide naturalistic effect. It should provide shelters and withdrawal areas to animals. It must be ensured that adequate tree cover is always maintained in the safari.

Central Zoo Authority

- The CZA is a **statutory body** constituted under **Wildlife protection act amended in 1992**.
- It is **chaired by the environment minister**
- Apart from the chairman, it **consists of 10 members and a member-secretary**.
- Almost all of them are officials in the Environment Ministry and non-government experts are those who are wildlife conservationists or retired forest officers.
- **Functions:** 1) to **specify the minimum standards** 2) to evaluate and assess the functioning of the zoos 3) to recognise or derecognise zoos; 4) to identify endangered species 5) to coordinate the acquisition exchange 6) Identify priorities, themes

and approval of Master Plan 7) Provide technical assistance to Zoos 8) to release financial assistance to Zoos 9) to ensure maintenance of studbooks 10) to coordinate training of zoo personnel 11) to coordinate research and education.

31. Wildlife Institute of India working on vaccine to reduce 'vermin' populations

Section: Environment laws

Context: The Wildlife Institute of India (WII) is working to develop immuno-contraceptive measures for population management of species that have become problematic for humans in many parts of the country.

More on the News:

- The new measures will be able to reduce reproduction in the species by **making the female sterile**. This will be done by **injecting a vaccine made from a hormone derived from the ovary lining of pigs**.
- The Union Ministry of Environment, Forests and Climate Change (MoEF&CC) approved the 10-year research project for developing the immuno-contraception in 2016.
- The project deals with population management of species involved in human-wildlife conflict. It includes a study on immune-contraceptive measures for population management of four species namely **elephant, wild pig, Rhesus macaque and Nilgai**.

Vermin

- The **Wild Life (Protection) Amendment Bill, 2021** brings in a major change by **reducing the number of schedules from six to four**. It proposes to **remove Schedule V completely**.
- Originally, the **WLPA, 1972** currently has **six schedules** that assign varying degrees of protection to animals and plants.
- Under **Schedule I and II** of the Act, for instance, **animals and birds** such as **tigers and elephants are offered the highest protection**.
- **Schedule V** lists species classified as '**vermin**', such as **common crows, fruit bats, rats and mice**, which **may be hunted freely**.
- Though the act does not define the word '**vermin**', **WLPA's 62nd section grants the central government the power to declare any wild animal** (other than those specified in Schedule I and Schedule II) as '**vermin**' for any area and a specified period.

Background:

- The category of '**vermin**' in the **WLPA** has distinct **colonial origins**. The British Raj brought to India the ideas of **desirable animals** (suitable for hunting and subsequent consumption being considered game) and **problematic animals** (considered vermin).
- British legislation was the first to mandate the extermination of vermin as seen in India under the **WLPA, 1972**. These were the **Tudor Vermin Acts** that allowed **eradication of nuisance animals or agricultural pests**.

Vermin:

Vermin are usually considered **problem or nuisance animals** that attack humans, crops, livestock or property.

In order to **prevent human-wildlife conflicts**, several states in the past have petitioned to **declare various animals to be 'vermin'**, including **elephants, Indian porcupine, bonnet macaque, common langur and barking deer**.

In 2016, the Centre declared **rhesus monkeys** in Himachal Pradesh, **wild boar** in Uttarakhand and **Nilgai** in Bihar to be '**vermin**'.

- The Vermin Acts included The **Preservation of Grain Act, 1532**, which created an official list of '**vermin**' animals. These included **owls, otters, foxes, hedgehogs** and **others that were seen as bad omens or competitors of food** with humans.

Dangers of Mass Culling:

- **Ecological Imbalance** due to blanket permission & financial incentives by Govt to eradicate vermin population
- **Exacerbate Human Wildlife Conflict** e.g.: unscientific killings of rhesus monkeys disrupt the power hierarchy among them and babies or sub-adults might not know how to behave and, thus, might cause havoc and create more conflict.
- **Endanger targeted species and fatal for non-targeted species** (traps and snares)
- long-lasting **impact on the ecosystem and biodiversity**.

32. Forest Fire in Odisha

Section: Biodiversity

Context: Odisha has seen more than 200 cases of forest fires since the beginning of the year, with the latest one in a reserve forest at Anantapur village.

More on the News:

- There have been **1,151 fire incidents in the state** from January 1 to February 7, according to the SNPP-VIIRS monitoring system, the Forest Survey of India's (FSI) website noted.
- Last year, there were just 405 fire incidents for the same period, according to the SNPP-VIIRS monitoring system. This is a **284 per cent increase** in the number of fire incidents for the same period.
- Odisha have not received any rainfall since November. It has been more than three months of dry spell. State mostly have **deciduous forests with majorly Sal trees**, their **dry leaves are falling and getting accumulated on the forest floor** which is leading to ground fires as the **temperatures are rising**.

Forest Fire:

- Forest fires, also called **wildfires and bush or vegetation fires**, are described as **uncontrolled**, often **widespread burning** of plants in **forests, grasslands, brushland, and tundra**.
- **Types of Forest Fires:**
 - **Surface fires**— easiest fires to control and **cause the least damage** as they **burn only surface plant litter**.
 - **Ground fires**— also called 'underground' or 'subsurface fires', **burn within humus, peat, and piles of vegetation** that are dry enough to burn. Although such fires spread very slowly, they are often difficult to suppress or fully extinguish, which makes them **dangerous**.
 - **Crown fires**— **most intense and dangerous** forest fires as they **burn whole trees** and can spread rapidly by **spreading across tree tops due to winds**.
 - The UNEP report provides a **new classification** for forest fires – **landscape fires** and
- **Landscape fires** are defined as being **seasonal**, of **moderate intensity** (with few instances of high intensity), **easily controlled**, and having a **low environmental impact** (for some species it may even have a positive impact).
- Wildfires are defined as **extreme events**, of **high intensity**, that are **difficult to control**, and have **severe social, economic, and environmental impacts**.

Efforts to protect forests from fire:

- In 2004, the FSI developed the **Forest Fire Alert System** to monitor forest fires in real time.
- In its advanced version launched in January 2019, the system now uses satellite information gathered from NASA and ISRO.
- The real-time fire information from identified fire hotspots is gathered using **MODIS sensors**(1km by 1km grid) and electronically transmitted to FSI.

What needs to done:

- Creation and maintenance of **fire lines in forest areas**, **engagement of fire watchers**, creation of water storage structures, strengthening of forest infrastructure, procurement of firefighting equipment, soil and moisture conservation in high risk areas, awareness creation and incentivizing villages / communities for protection against forest fires.

33. BRO comes up with energy efficiency habitat, tents for Leh

Section: Climate Change

More on the News:

- The Border Roads Organization (BRO) is in the process of developing **Energy Efficiency Habitat for its personnel** at CE Project Himak in Leh at a cost of ₹45.90 crore.
- the overall layout of the Habitat has been done in a manner to achieve a **climate-responsive and thermally efficient building** and its design has been vetted by IIT Roorkee.
- It will **reduce energy consumption for heating and lighting** by 60 per cent, achieve a **cost savings** of approximately ₹64 crore over its 50-year design life.
- The project has been **planned on Energy Conservation Building Code (ECBC) and Eco-Niwas Samhita 2018**, meant for residential buildings.
- BRO has also come up with integrated energy conserving tents. These are PUF insulated flexible floor tents, highly energy conserving and useful for mobile detachments, explained BRO officials.
- Outer and inner lining is **polyester fabric coated with polyethylene lining**, and it is self-extinguishing and fire retardant. The tents can withstand high wind speeds up to 120 Kmph and are fitted with 3-in-1 room heating system with hot plate for cooking and hot water tank.

34. GOBAR-DHAN scheme

Section : Sustainable Development

Context: Union Finance Minister **announced 500 new 'waste to wealth' plants** for promoting a circular economy with a total investment of Rs 10,000 crore under the GOBAR-Dhan scheme in the budget speech.

GOBAR-DHAN scheme

- Ministry of Drinking Water & Sanitation has launched the GOBAR (Galvanizing Organic Bio-Agro Resources) – DHAN scheme. The scheme is being implemented as **part of the Swachh Bharat Mission** (Gramin).

- The Swachh Bharat Mission (Gramin) comprises **two main components** for creating clean villages – **creating open defecation free (ODF) villages** and **managing solid and liquid waste in villages**.
- The GOBAR-DHAN scheme, with its focus on **keeping villages clean, increasing the income of rural households, and generation of energy from cattle waste**, is an important element of this ODF-plus strategy.
- The programme will be implemented using SLWM funding pattern of SBM-G Guidelines.

Sustainable Alternative Towards Affordable Transportation (SATAT)

- Sustainable Alternative Towards Affordable Transportation (SATAT) is an initiative aimed at **setting up of Compressed Bio-Gas production plants** and make it available in the market for **use in automotive fuels** by inviting Expression of Interest from potential entrepreneurs.
- The initiative was **launched in October 2018** by the **Ministry of Petroleum & Natural Gas** in association with Public Sector Undertaking (PSU) Oil Marketing Companies (OMC) viz. Indian Oil Corporation Ltd., Bharat Petroleum Corporation Ltd. and Hindustan Petroleum Corporation Ltd.
- Aim: To produce compressed biogas (CBG) from Waste and Biomass sources like **agricultural residue, cattle dung, sugarcane press mud, Municipal Solid Waste (MSW)** and sewage treatment plant waste and make CBG **available in the market for use as a green fuel**.
- Compressed Bio-Gas (CBG) plants are proposed to be **set up mainly through independent entrepreneurs**. CBG produced at these plants will **be transported through cascades of cylinders to the fuel station networks** of OMCs for marketing as a green transport fuel alternative.

About National Bioenergy Programme

- **The Ministry of New and Renewable Energy** has notified the National Bioenergy Programme in November 2022.
- MNRE has continued the National Bioenergy Programme for the period from FY 2021-22 to 2025-26.
- The Programme has been recommended for implementation in two Phases:
 - **The Phase-I** of the Programme has been approved with a budget outlay of Rs. 858 crores.

The National Bioenergy Programme will comprise the following sub-schemes:

- **Waste to Energy Programme**
 - It is Programme on Energy from Urban, Industrial and Agricultural Wastes / Residues to support the setting up of large Biogas, BioCNG and Power plants.
 - **Indian Renewable Energy Development Agency (IREDA)** will be the **implementing agency** for the program.
- **Biomass Programme**
 - It is a Scheme to Support Manufacturing of Briquettes & Pellets and Promotion of Biomass (non-bagasse) based cogeneration in Industries to support setting up of pellets and briquettes for use in power generation and non-bagasse based power generation projects.
- **Biogas Programme**
 - To support setting up of family and medium size Biogas in rural areas.

Biogas

- Biogas is a **co-product of the anaerobic digestion** (under the absence of oxygen) of **biodegradable waste** such as agricultural waste, animal waste like dung and segregated organic fraction of municipal solid waste.
- Anaerobic digestion yields a variety of products in three different formats. The slurry obtained from the process is usually passed through a solid-liquid separation unit to **extract the liquid by-product**, known as liquid fertiliser and the solid fraction, known as fermented organic manure (FOM).
- The **co-product obtained in the liquid fraction is usually re-circulated and used in the digestion process**, while the solid fraction can be used as a soil conditioner or fertiliser.
- The gaseous fraction obtained in the process is known as **biogas**. Biogas contains about **55-65 per cent methane, 35-44 per cent of carbon dioxide** and traces of other gases such as hydrogen sulphide, ammonia and nitrogen.
- In its raw form, biogas can be **used as a clean cooking fuel like LPG for lighting, motive power and electricity generation**.
- Further, biogas can be **purified and upgraded up to 98 per cent of purity to make it suitable to be used as a green fuel** for transportation or filling of cylinders. The process relies on a **high pressure** of circa 250 bar and hence is called **compressed biogas (CBG)**.
- Compressed Bio-Gas is exactly **similar to the commercially available natural gas** in its composition and energy potential. With calorific value (~52,000 KJ/kg) and other properties similar to CNG, **Compressed Bio-Gas can be used as an alternative, renewable automotive fuel**. Given the abundance of biomass in the country, Compressed Bio-Gas **has the potential to replace CNG in automotive, industrial and commercial uses** in the coming years.

35. Agrochemicals

Agrochemicals

- Agrochemicals are essentially **chemicals used for industrial agriculture**. They can be **crop protection chemicals such as pesticides** that include insecticides, fungicides and herbicides. They can also be **crop nutrient chemicals** such as synthetic fertilisers.
- FICCI report in 2021, stated that India is **one of the most prominent exporters of agrochemicals** in the world, exporting to four main countries – USA, Japan, China and Brazil.
- The most prominent agrochemicals exported include **mancozeb, 2,4D, acephate, chlorpyrifos, cypermethrin and profenofos**.
- India is currently the **12th largest exporter** of chemicals in the world (excluding pharmaceuticals).
- India is the **fourth-largest producer of agrochemicals** in the world. The government has included the agrochemical sector **among the 12 champion sectors** where India can play an important role in the global supply chain.
- Among the chemical manufacturing states, **Gujarat leads with the highest number of chemical factories**.
- **Improper use of pesticide turns fatal**
 - Pollution generated by agrochemicals is largely of two types — one is the point **pollution generated from the source**, where factories manufacture the agrochemicals. The second is **diffused pollution**, that comes after application of **the agrochemicals on crops**.
 - In India glufosate and paraquat are two extensively used pesticides in the country.
 - In May 2020, the government of India released a **draft notification, the Banning of Insecticides Order, prohibiting the manufacture and use of 27 insecticides**. The order, almost three years later, is still a draft.
 - The **Insecticides Act, 1968 and The Insecticide Rules, 1971** were set up to **regulate the import, manufacture, sale, transport, distribution and use of insecticides** with a view to prevent risk to human beings or animals.
 - The **Central Insecticides Board and Registration Committee** was set up under the insecticides act to **advise the central government on the manufacture of insecticides** under the Industries (Development and Regulation) Act, 1951 (65 of 1951), specify the uses of the classification of insecticides on the basis of their toxicity as well as their being suitable for aerial application and several related functions.
 - One of the functions also includes **clearly indicating the dosage and frequency of application**, the potential harm caused, and approving the crops where the said pesticides can be applied.
 - The **Pesticide Action Network India** released a report also said that labelling, recommended use and actual use of **four pesticides (chlorpyrifos, fipronil, atrazine and paraquat dichloride)** breached provisions of Insecticide Act, 1968 and Insecticide Rules 1971, as well as the International Code of Conduct on Pesticide Management.
 - Apart from this, there are a few studies in India that show that pesticides, when **indiscriminately and inappropriately applied to crops**, may **leach into the soil and into the groundwater, and run-off in the rain into surface water bodies**, contaminating them.
 - Pesticides settling in sediment and soil manage to find their way into water bodies, **endangering aquatic life as well**.

36. Climate-smart marine protected areas can shield biota from global warming

Section: Climate change

Context: Marine Protected Areas (MPA) should be established in places where climate change is least likely to harm biodiversity, an expert said at the ongoing fifth International Marine Protected Areas Congress in Canada.

More on the News:

- Experts gathered at the congress to **discuss the impacts of climate change on MPAs**, which are designated areas managed for the long-term conservation of marine resources and ecosystem services.
- Countries agreed to **protect 30 per cent of the planet's lands and oceans by 2030** at the 15th Conference of the Parties to the Convention on Biological Diversity, 2022.
- Climate change is driving ocean temperature and sea level rise. The waters are turning acidic.
- Temperatures of the **top few metres of the sea have increased by approximately 0.13 degrees Celsius per decade** over the past 100 years, according to the United States National Oceanic and Atmospheric Administration (NOAA).
- Experts find that 6-12 per cent of the water column in the high seas will be **less affected by the changing climate**. These will be great places to have benchmark MPAs.

Marine protected areas:

- Marine protected areas (MPA) are **protected areas of seas, oceans, estuaries**.
- MPAs **restrict human activity for a conservation purpose**, typically to protect natural or cultural resources.
- Such marine resources are **protected by local, state, territorial, native, regional, national, or international authorities** and differ substantially among and between nations.
- This variation includes **different limitations on development, fishing practices, fishing seasons and catch limits**, moorings and bans on removing or disrupting marine life.
- In some case, MPAs also **provide revenue for countries**, potentially equal to the income that they would have if they were to grant companies permissions to fish.
- The MPA network in India has been used as a **tool to manage natural marine resources** for biodiversity conservation and for the well-being of the people dependent on it.

- Scientific monitoring and traditional observations confirm that **depleted natural marine resources are getting restored and/or pristine ecological conditions have been sustained** in well managed MPAs.
- India has designated **four legal categories of protected areas**:

Categories of Marine Protected Areas

Category I	Category II	Category III A	Category III B
National parks and sanctuaries have an entire area of mangroves, coral reefs, creeks, and seagrass beds, algal beds, estuaries, and lagoons	This includes Islands, which have major parts in the marine ecosystem and some parts in the terrestrial ecosystem.	his includes sandy beaches beyond the intertidal line but occasionally interacting with the seawater.	This includes evergreen or semi-evergreen forests of the Islands.

- There are **24 MPAs in peninsular India** and more than 100 MPAs in the country's 2 islands.



37. As we fight to protect species on the brink of extinction, let's not forget the familiar ones

Section: Biodiversity

Context: To conserve nature, we must maintain our focus on the familiar.

More on the News:

- In the natural world, rarity is most starkly represented by the last members of a declining species. These scarce plants and animals are infinitely valuable; they represent the final hope for averting extinction.
- In the past few decades, declines of many endangered plants and animals have been reversed. **Dozens of unique living forms have been saved from extinction.** But a preoccupation with scarcity could come at the expense of overlooking the ordinary.
- But if we are to conserve nature and its myriad benefits to people **we must maintain our focus on the familiar.**
- In North America, they include the extinction of the passenger pigeon, which was once the most numerous bird in the world. These species were **once regarded as super-abundant, their decline and disappearance inconceivable.**
- Notably, the shifts in abundance of common species can **translate into sizeable shifts in ecosystem functioning.** Birds, despite their diminutive stature, throw their aggregate weight around, owing to the innumerable insects they eat, the flowers they pollinate and the seeds they disperse.
- Rarity will always occupy a prominent place in conservation.** But in the quest for a sustainable and biodiverse future, we **must avoid "the extinction of commonness."** The ingredients for success are at hand: Monitor nature closely, guard against complacency and invest for the long term.

38. Alien invasive plants increasing in higher elevations

Section: Biodiversity

Context: In Kashmir Himalayas in India, scientists have noted **railway and road infrastructure expansion is a contributing factor to the march of invasive alien plant species** higher into the mountains.

More on the News:

- The study shows “consistent increases” in the number of alien plant species and their swift spread into higher elevations between 2007 and 2017.
- The number of alien plant species surveyed in each region has **increased by a global average of 16% in the past 10 years**. In addition, in ten out of the eleven mountain regions studied, the species are occurring at significantly higher elevations than ten or even five years ago
- Most non-native plants are **promoted by disturbance caused by human activities**. In mountainous areas, **roads provide access points and conduits for spread**, with the result that many non-native plants can be found in disturbed roadside habitat. Roads also provide very convenient ways to sample a range of elevation zones.
- **Climate warming** will “almost certainly” **increase the suitability of higher-elevation** regions for many nonnative plants, and so promote further expansion.
- Invasive daisies such as the **ox-eye daisy were detected in several of the regions** surveyed in the study, including in the Kashmir Himalayas.
- About 50% of invasive plants in the **Hindu Kush Himalaya (HKH) region have been introduced unintentionally**. Largely, countries in the Hindu Kush Himalayan region **lack policies and legislation to tackle invasive alien species** because it is not a priority conservation issue.

39. Tunnel to save mangroves to raise bullet train project

Section: Biodiversity

Context: Tunnel will escalate construction cost of Mumbai-Ahmedabad High Speed Rail Corridor project’s 21-km long stretch from ₹100 crore to ₹10,000 crore.

More on the News:

- A **seven-km undersea tunnel** will be constructed for the bullet train project in a bid to **save about 12 hectares of mangrove forests** in Maharashtra’s Thane creek.
- This will escalate the construction cost of the Mumbai-Ahmedabad High Speed Rail Corridor project’s 21-km long stretch from Bandra Kurla Complex Station to Shilphata, from ₹100 crore to ₹10,000 crore.

Bullet train

- It is under-construction high-speed rail line **connecting the cities of Ahmedabad and India’s economic hub Mumbai with the help of Japan**.
- It will be built with the help of Japan through **Japan International Cooperation Agency (JICA)**.
- Bullet train or **High Speed Rail is an integrated system** having overall optimization of various components, viz. Hardware, Software, Human-ware, and their interface, etc.
- The train, with a **capacity of 750 passengers**, will travel at **speeds between 320 km/hr and 350km/hr** and is expected to reduce travel time **between Ahmedabad and Mumbai** to three-and-a-half hours or less from the present eight.
- **Potential benefit:** High-speed connectivity; new job opportunities; Urban expansion; make India favorable destination for high-speed train technologies; Social Benefits (reduced CO2 emission, comparatively less land required than a 6-lane highway for same passenger capacity).

40. India’s pollution control boards were weakened over the last 14 years

Section: Pollution

Context: India’s pollution control boards were weakened over the last 14 years.

More on the News:

- Around 49 per cent of the sanctioned positions in state pollution control boards (SPCB) and pollution control committees (PCC) are vacant, Union minister of state for environment, forest and climate change (MoEF&CC) informed the Rajya Sabha.

Central Pollution Control Board

- The Central Pollution Control Board (CPCB), **statutory organisation, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974**.
- Further, CPCB was entrusted with the powers and functions **under the Air (Prevention and Control of Pollution) Act, 1981**.
- It serves as a field formation and also provides **technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986**.

Functions of the Central Board at the National Level

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air. Plan and cause to be executed a nation-wide programme for the prevention, control or abatement of water and air pollution;
- Co-ordinate the activities of the State Boards and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigation and research relating to problems of water and air pollution, and for their prevention, control or abatement;
- Plan and organise training of persons engaged in programme on the prevention, control or abatement of water and air pollution;
- Organise through mass media, a comprehensive mass awareness programme on the prevention, control or abatement of water and air pollution;
- Collect, compile and publish technical and statistical data relating to water and air pollution and the measures devised for their effective prevention, control or abatement;
- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;
- Disseminate information in respect of matters relating to water and air pollution and their prevention and control;
- Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air; and Perform such other function as may be prescribed by the Government of India.

State Pollution Control Boards:

- They are constituted in pursuance of the **Water (Prevention & Control of Pollution) Act, 1974**.
- After the enactment of the Air (Prevention & Control of Pollution) Act, 1981, the enforcing responsibility was entrusted to these Boards.
- **Selection of members:** The members of State Pollution Control Boards are **nominated by respective State Governments**.

41. Marine litter menace

Section: Pollution

Context: Marine litter menace, Short-term solutions not enough; need robust policy.

More on the News:

- Globally, the **annual production of plastic reached 460 million tonnes** in 2019 and 353 million tonnes of plastic waste were also generated in the same year.
- Approximately **50 per cent of plastic waste generated in the same year was dumped in landfills**, according to the Organization for Economic Cooperation and Development.
- A significant portion of **single-use plastic gets piled up on coastlines and contributes to the growing burden of marine litter**, endangering aquatic biodiversity. In India, anthropogenic activities add approximately **eight million tonnes** of plastic waste to the marine environment.

Key sources

- **Land-based sources** such as **dumpsites located near the coastlines** or banks of a river, flood waters, **industrial outfalls**, discharge from storm water drains, **untreated municipal sewerage**, **beach litter**, **tourism**, **fishing**, **ship breaking yards**, defence-related facilities, automobiles, industrial wastes, natural events, etc are the main factors contributing to the menace of marine litter.
 - Of this, around **75-80 per cent of municipal waste is collected** and **only 25-28 per cent of this collected waste is processed and treated**. The discarded municipal solid waste takes the conventional route of natural waterways and becomes part of marine litter
- In addition to this, **sea-based sources** such as **waste from ships**, **fishing vessels** and other public transport and research facilities; offshore mining and extraction; **legal and illegal waste dumping**; ghost nets, natural events, etc.

Impact of Marine Litter

- Marine debris can **transcend international borders** and disperse to faraway locations from its place of origin. Since marine species **consume microplastics**, they can eventually **sweep into our food chain**.
- Additionally, **leached chemicals may also bioaccumulate** in these species and endanger human health.
- It can create problems for industries such as Shipping, fisheries and aquaculture and maritime tourism which affect livelihood of the coastal community.

Global efforts to tackle Marine litter menace

- The **1972 Convention on the Prevention of Marine Pollution** by Dumping Wastes and Other Matter (or the London Convention).
- The 1996 Protocol to the London Convention (the London Protocol).
- The 1978 Protocol to the **International Convention for the Prevention of Pollution from Ships (MARPOL)**.

- The United Nations Environment Program (UNEP) considers plastic marine debris and its ability to transport harmful substances as one of the main emerging issues affecting the environment.
- **GloLitter Partnerships Project:**
- It is launched by the **International Maritime Organization (IMO) and the Food and Agriculture Organization** of the United Nations and initial funding from the Government of Norway.
- Aim: To **prevent and reduce marine plastic litter** from shipping and fisheries.

Indian efforts to tackle Marine litter menace

- The **Plastic Waste Management Rules, 2016** clearly stipulate that urban local bodies (ULBs) should ban less than 50 micron thick plastic bags and not allow usage of recycled plastics for packing food, beverage or any other eatables.
 - The Rules also require that local bodies should provide separate collection, storage and processing of plastic waste in their areas.
- The government has set an ambitious target of **eliminating single-use plastics** by 2022.
- India is a **signatory to MARPOL** (International Convention on Prevention of Marine Pollution).
- Clean Seas Campaign

Clean Seas Campaign

- **Launched in 2017**, the Clean Seas campaign engages governments, the general public, civil society and the private sector to strengthen effective action plans on marine litter and plastic pollution. Currently, 63 countries are Clean Seas signatories.
- **Clean Seas 2.0** initial focus on **single-use plastics and their elimination**, communicating the root causes associated with the production, use and disposal of unnecessary, avoidable and problematic plastics thereby following an **evidence-based approach**.
- Its topic areas will cover a range of products, including packaging, ghost fishing gear, tyres and textiles.
- It leverages two key river-focussed UNEP projects: **Counter MEASURE and Mississippi River Plastic Pollution Initiative**.
- The “**Counter MEASURE**” uses cutting-edge technology to identify the source of plastic pollution in **river systems in Asia – primarily the Ganges and Mekong**. Through a combination of **citizen science, drone imaging, machine learning and geographic analyses**, the project collects data and identifies plastic waste hotspots and shares it with partner organizations and governments across the region.
- **Citizen science** is a critical aspect of the “**Mississippi River Plastic Pollution Initiative**” also led by UNEP in partnership with the Mississippi River Cities and Towns Initiative and the University of Georgia.
- **UNEP and the Ellen Mc Arthur Foundation** also co-lead the **Global Commitment**, which has established a common vision of a **circular economy for plastics by 2025**.
- Through the Global Partnership on Marine Litter, UNEP is developing a **Digital Platform** to bring together and connect actors and information to catalyse action before plastic pollution ends up in the ocean.

“Swachh Sagar, Surakshit Sagar”

- Globally, “**International Coastal Clean Up Day**” is celebrated on the third Saturday of September, every year.
- This year on 17th September 2022, the Government of India along with other voluntary organizations, and the local society will run a cleanliness campaign “Swachh Sagar, Surakshit Sagar” along India’s entire coastline.
- This campaign will include **Ministry of Earth Sciences (MoES), Ministry of Environment Forest and Climate Change (MoEFCC), Indian Coast Guard, National Disaster Management Authority (NDMA)** along with other social organizations and educational institutions.
- This campaign will see massive public participation both physically and virtually, mainly to make awareness about reducing the marine litter, minimal use of plastics, segregation at source and waste management.
- It will be the first-of-its-kind and longest running coastal clean-up campaign in the world with highest number of people participating in it. The participation of common man will convey the message of “**Swachh Sagar, Surakshit Sagar**” for the prosperity of not only coastal areas but also other parts of the country.
- This year’s event also coincides with the celebrations of Azadi Ka Amrit Mahotsav in 75th year of the country’s independence; The coastal clean-up drive will be carried out at 75 beaches across the country. A 75 days long campaign will

be launched from 03rd July 2022 to raise awareness about “Swachh Sagar, Surakshit Sagar” culminating on “International Coastal Cleanup Day” on 17th September 2022.

A mobile app “Eco Mitram” has been launched to spread awareness about the campaign and also for the common people for voluntary registration for the beach cleaning activity on the 17th September 2022.

Through this campaign, a mass behavioural change among the masses is intended by raising awareness about how plastic usage is destroying our marine life

Important Initiatives undertaken by UNEP so far:

1. Regional Seas Programme, 1974
2. Clean up the world Campaign, 1993
3. TUNZA, 2003
4. Billion Tree Campaign, 2006
5. Faith for Earth Initiative, 2008
6. World Environment Day (June 5th)
7. Not all animals migrate by choice campaign, 2019

42. 145 bird species spotted during the first bird festival in Sundarbans

Section: Species In news

Context: The first-ever festival was organised by the Sundarban Tiger Reserve (STR) division of West Bengal Forest Department, where six teams visited different areas inside the Sundarban Biosphere Reserve.

More on the News:

- The species recorded during the Bird Festival included 78 forest birds and 42 species of waders, raptors etc.
- Among the threatened species of the Sundarbans, **Eurasian Curlew was spotted**. Birders were able to spot seven of the nine species of **kingfishers** found in the Sundarbans.
- Despite being home to so many species of birds the **habitats face different threats** including **plantation activity** along the chars (river islands) which disturbs the birds, and **illegal activities along chars and uninhabited islands**. The threats also **include climate change and the use of destructive fishing nets** in the Sundarbans.
- There is also a need for **increasing protection along non-forest areas** for birds as well as **creating small protected areas** in the non-forest regions at critical locations for bird-breeding and migration.

Sundarban National Park

- The Sundarban National Park is located in the **south-east of Calcutta** in the District of West Bengal and forms part of the Gangetic Delta.
- The Sundarbans **mangrove forest, one of the largest such forests** in the world, lies across India and Bangladesh on the delta of the Ganges, Brahmaputra and Meghna rivers on the Bay of Bengal.
- It is adjacent to the border of India’s Sundarbans **World Heritage site** inscribed in 1987.
- The site is intersected by a complex network of tidal waterways, mudflats and small islands of salt-tolerant mangrove forests, and presents an excellent example of ongoing ecological processes.
- The area is known for its wide range of fauna, including 260 bird species, the **Bengal tiger** and other threatened species such as the **estuarine crocodile and the Indian python**.
- It is home to many rare and globally threatened wildlife species such as the estuarine crocodile, Royal Bengal Tiger, Water monitor lizard, Gangetic dolphin, and olive ridley turtles.
- Sundarban Wetland, India was recognised as the ‘**Wetland of International Importance**’ under the Ramsar Convention in January 2019.
- The Sundarbans Delta is the **only mangrove forest in the world inhabited by tigers**.

43. ‘Mangrove Mission’ helps Sundarbans residents fight storms, cyclones and unemployment

Section: Ecosystem

Context: In May 2020, when super cyclone Amphan hit the coast of Sundarbans, wreaking havoc in the region, the mangroves played a big role in protecting the life and livelihood of millions of people.

More on the News:

- In May 2020, when super cyclone Amphan hit the coast of Sundarbans, wreaking havoc in the region, the mangroves played a big role in **protecting the life and livelihood** of millions of people by **acting as a bio-shield and protecting the embankments**.
- It was found that wherever the mangroves were deforested, lost and destroyed, the **embankments were breached and saline waters inundated agricultural land** and ponds causing further damage to the fragile terrain.

How mangrove save from cyclone:

- Mangroves also play another important role for humans, protecting communities from major storms. Climate change is more than rising temperatures, and the **increased frequency and intensity of cyclones**, hurricanes and typhoons is apparent.
- Mangrove **roots can break up the force of a storm surge, soaking up some of its energy** and protecting people living on coasts from cyclone damage.
- Mangroves can effectively **absorb about 70-90 percent of normal wave energy**. It is evident that even under extreme circumstances, mangroves' dense root and branch networks could help diffuse tsunamis, and reduce their devastating effects.

Mangrove Mission

- Mangrove Mission was **conceived for eco-restoration of the area** and also to protect the city of Kolkata from the wrath of cyclonic storms.
- The South 24 Parganas district administration began a **robust planning effectively** implement the initiative.
- The entire programme was **undertaken by the district MGNREGA Cell** and administration of South 24 Parganas and **implemented by the forest department, involving local communities, especially women**. They were made aware of the effects of cyclonic storms and the usefulness of mangrove trees.
- It is completely a project for the people of Sundarbans, which is being **implemented with the help of local villagers**. This has **generated income** for them as they are being employed under MGNREGA

44. Loss and damages fund

Section: Climate Change

Context: The term widely used in UN Climate Change negotiations broadly refers to the measure of losses and damages due to the negative impacts of the climate crisis.

More on the News:

- The damages from climate change are **both economic and non-economic**. In the case of the former, we can assign a monetary value, whereas the same does not apply to non-economic losses.
- **Non-economic losses** can range from the loss of cultural heritage and societal or cultural identity to the loss of biodiversity, ecosystem services and intergenerational trauma due to extreme climate events.
- The **recently concluded COP27 in Sharm el-Sheikh, Egypt** witnessed history in creating the “loss and damages” fund to assist the most vulnerable countries with damages from climate-linked disasters.
- The developments at COP27 have been welcomed by India, however, with the condition that **only developed countries are obligated for such funding arrangements**.
- India's Union Minister for Environment, Forests and Climate Change expressed that India will seek funds from the facility, considering it is extremely vulnerable to climate change.

Loss and damages

- The **Intergovernmental Panel for Climate Change (IPCC)** definition for ‘loss and damage’.
 - The term ‘losses and damages’ refers to the **economic and non-economic impacts of climate change**, including extreme and slow onset events, in **developing countries that are particularly vulnerable to the adverse effects of climate change**. It's **destructive, irreversible, and cannot be addressed** by mitigation and adaptation measures.
- **Evolution**
 - L&D was brought up as a **demand in 1991 by the island country of Vanuatu**, which was representing the Alliance of Small Island States (AOSIS).
 - Since the United Nations Framework Convention on Climate Change was formed in the early 1990s, loss and damage due to climate change have been debated.
 - The Least Developed Countries Group has **long aimed to establish accountability and compensation** for loss and destruction.
 - **Warsaw International Mechanism on Loss and Damages (WIM)** was founded in 2013 without funding after extensive pressure from developing countries.

- At the COP26 in Glasgow, the G77, a coalition of 134 developing countries, and China, **proposed the Loss and Damage Finance Facility (LDFF)**, a dedicated stream of finance to specifically address losses and damages.
- It is **finally approved in CoP 27**, at Sharm-El-Sheikh, Egypt.

45. Orca moms may be feeding their sons into extinction

Section: Biodiversity

Context: The study took place over nearly half-a-century and followed the lives of 40 female orca whales. The researchers wanted to understand why the species was becoming increasingly endangered.

More on the News:

- Researchers found that when **female orca whales had sons their chances of giving birth to future offspring reduced by 50%**. This remained the case throughout the mother's lifetime and was not observed in orcas who gave birth to daughters.
- Killer whale mothers pay a high cost in terms of their future reproduction to keep their sons alive.
- It was along with these findings about the **decreased reproduction rates** that the researchers also noted how **orca mothers continued a very close maternal relationship with their male offspring**. The mothers gave their sons half the salmon they caught for themselves.
- That was not the case for the orca daughters, who were generally fed by their mothers until they reached their own reproductive age.
- There is an idea that this behavior — to ensure the young male orcas are fed and fit — could be an attempt by their mothers **to increase the overall reproductive output** of their population. Healthy males mate with many females, and that ultimately could increase the number of future offspring.
- This strategy of indefinitely sacrificing future reproduction to **keep their sons alive may have been beneficial in their evolutionary past**, but it now **potentially threatens the future viability of the southern resident killer whale population**.

About killer whales (orca):

- Orcas belong to a **highly evolved group of toothed whales** under the suborder Cetacean and **dolphin family** and are widely distributed in temperate and tropical waters.
- They **have long life spans** and are highly social, feeding cooperatively, and with complex vocal behaviours.
- While most killer whale populations in other regions show high site fidelity and residence rates, resident populations are yet to be identified in the northern Indian Ocean.
- Given their **highly social** and curious behaviour, orcas often approach fishing vessels to assess if there is any fish in the net, or just to observe people on the vessel.
- In the wild, there are **no instances of killer whales** fatally attacking humans.

45. Pinpointing priority areas for mangrove conservation in the Sundarbans

Section: Ecosystem

Context: A new study published in Scientific Reports has **mapped priority areas** in the Sundarbans Biosphere Reserve (SBR) that are **highly suitable for mangrove conservation and restoration**.

About Sunderbans

- It is a vast contiguous mangrove forest ecosystem in the coastal region of Bay of Bengal spread over India and Bangladesh on the **delta of the Ganges, Brahmaputra and Meghna rivers**.
- The site **is intersected by a complex network of tidal waterways, mudflats and small islands** of salt-tolerant mangrove forests and presents an excellent example of ongoing ecological processes.
- It constitutes over **60% of the country's total mangrove forest area**.
- Indian Sunderbans was recognised as **UNESCO World Heritage Site in 1987**, 'Wetland of International Importance' **under the Ramsar Convention in January 2019** and also a **Biosphere Reserve in 1989**.
- The area is known for its wide range of fauna, and is home to many rare and globally threatened wildlife species such as the **Estuarine Crocodile, Royal Bengal Tiger, Water Monitor Lizard, Gangetic Dolphin and Olive Ridley Turtles**.
- The Sunderbans Delta is the **only mangrove forest in the world inhabited by tigers**.
- For its preservation, Discovery India and World Wide Fund (WWF) India partnered with the Government of West Bengal and local communities in the Sunderbans in 2019.
- It is the world's largest single block of mangrove and "is **highly threatened and drastically reducing at an alarming rate** due to the overexploitation of resources, land transformation for aquaculture practice, increase in paddy cultivation, infrastructural development, and human settlements

COP14 on wetlands

Aims and objectives of the COP-

- The **Conference of the Contracting Parties (COP)** invites Parties and relevant stakeholders to join this **international mangrove cooperation mechanism** for technical exchanges, collaborative research, education and training, and pilot projects on conservation and restoration, to protect mangrove biodiversity and coastal blue carbon ecosystems, enhance mangrove ecosystem services and resilience to climate change.

What is Ramsar Recognition?

- A **Ramsar site** is a **wetland of international importance** under the **Ramsar Convention**, which is also known as the '**Convention on Wetlands**' - an **intergovernmental environmental treaty** established by **UNESCO** in **1971**, and named after the **city of Ramsar in Iran**, where the convention was signed that year.
- **Ramsar recognition** is the **identification of wetlands** around the world, which are of international importance, especially if they provide **habitat to waterfowl** (about 180 species of birds).
- There is international interest and cooperation in the conservation of such wetlands and the judicious use of their resources.
- **India's Ramsar wetlands** are spread over **11,000 sq km** — around **10% of the total wetland area in the country** — across **18 States**.
- No other South Asian country has as many sites though this has much to do with India's geographical breadth and tropical diversity.

Criteria: One of the nine criteria must be fulfilled to be the Ramsar Site.

- **Criterion 1:** If it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
- **Criterion 2:** If it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
- **Criterion 3:** If it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
- **Criterion 4:** If it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
- **Criterion 5:** If it regularly supports 20,000 or more waterbirds.
- **Criterion 6:** If it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.
- **Criterion 7:** If it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
- **Criterion 8:** If it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
- **Criterion 9:** If it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non avian animal species.

Significance:

- **Ramsar Tag** helps develop and maintain an **international network of wetlands** which are important for the conservation of **global biological diversity** and for sustaining human life through the maintenance of their ecosystem components, processes and benefits.
- Sites are protected under strict guidelines of the convention.

Mangrove Alliance for Climate

- An **initiative led by the United Arab Emirates (UAE) and Indonesia**, the **Mangrove Alliance for Climate (MAC)** includes **India, Sri Lanka, Australia, Japan, and Spain**.
- It aims to **educate and spread awareness** worldwide on the role of mangroves in curbing global warming and its potential as a solution for climate change.
- The **intergovernmental alliance** works on a **voluntary basis** which means that there are **no real checks and balances** to hold members **accountable**.
- The members will also **share expertise** and support each other in **researching, managing and protecting coastal areas**.

The current state of the mangroves

Geographical Location:

- Mangroves are found **only along sheltered coastlines** within **tropical or subtropical latitudes** because they **cannot withstand freezing temperatures**.
- They share the unique capability of growing within reach of the tides in salty soil.

Area Covered

- **Global Mangrove Cover:**
 - The total mangrove cover in the world is **1,50,000 sq kms**.
 - **Asia** has the largest number of mangroves worldwide.
 - **South Asia** comprises **8%** of the world's mangrove cover.
 - **India's** contribution is **8% total mangrove cover in South Asia**.

Mangroves in India:

- **Coverage:**

- According to the **India State of Forest Report, 2019**, the mangrove cover in India is **4,975 sq km**, which is **15%** of the country's total geographical area.
- **West Bengal** has **45%** of India's mangrove cover, followed by **Gujarat at 23.66%** and **A&N Islands at 12.39%**.



Largest Mangrove Forest:

- **Sundarbans in West Bengal** is the largest mangrove forest regions in the world. It is listed as a **UNESCO World Heritage Site**.
 - The forest is home to the **Royal Bengal tiger**, **Gangetic dolphins** and **Estuarine crocodiles**.
- **Bhitarkanika Mangroves:** The **second largest mangrove forest** in India is Bhitarkanika in Odisha created by the two river deltas of **River Brahmani** and **Baitarani**.
 - It is one of the most significant **Ramsar wetlands in India**.
- **Godavari-Krishna Mangroves, Andhra Pradesh:** The Godavari-Krishna mangroves extend from Odisha to Tamil Nadu.
 - The deltas of the **Ganges**, **Mahanadi**, **Krishna**, **Godavari**, and **Cauvery rivers** contain mangrove forests.
 - The **backwaters in Kerala** have a **high density of mangrove forests**.
 - **Pichavaram in Tamil Nadu** has a vast expanse of water covered with mangrove forests. It is home to many aquatic bird species.

Significance of Mangroves-

- Ecologically mangroves are important in **maintaining and building the soil**, as a reservoir in the **tertiary assimilation of waste**.
- They provide **protection against cyclones**.
- Promotes **land accretion, fixation of mud banks, dissipation of winds, tidal and wave energy**.
- The **dense tangle of roots** allows the trees to handle the daily rise and fall of tides.
- Mangrove forests **stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides**.
- Mangroves **improve water quality** by absorbing nutrients from runoff that might otherwise cause **harmful algal blooms offshore**.
- Both **coral reefs** and **seagrass beds** rely on the **water-purifying ability of mangrove forests** to keep the water clear and healthy.
- Mangroves make up **less than 2% of marine environments** but account for **10-15% of carbon burial**.
- Once the leaves and older trees die they fall to the seafloor and take the stored carbon with them to be buried in the soil.
- This buried carbon is known as **"blue carbon"** because it is stored underwater in coastal ecosystems like **mangrove forests, seagrass beds and salt marshes**.
- **Supports an incredible diversity of creatures** including some species unique to mangrove forests.
- They provide **habitat and refuge to a wide array of wildlife** such as **birds, fish, invertebrates, mammals and plants**.

Threats Faced by Mangroves

- **Commercialisation of Coastal Areas:** Aquaculture, coastal development, rice and palm oil farming and industrial activities are rapidly replacing these salt-tolerant trees and the ecosystems they support.
 - Mangrove coverage has shrunk by half in the last 40 years. Less than 1% of tropical forests are mangroves.
- **Shrimp Farms:** The emergence of shrimp farms has caused **at least 35%** of the overall loss of mangrove forests.
- **Temperature-Related Issues:** A **fluctuation of ten degrees** in a short period of time is enough stress to damage the plant and freezing temperatures for even a few hours can kill some mangrove species.
- **Soil-Related Issues:** The soil where mangroves are rooted poses a challenge for plants as it is severely lacking in oxygen.
- **Excessive Human Intervention:** During past changes in sea level, mangroves were able to move further inland, but in many places, human development is now a barrier that limits how far a mangrove forest can migrate.
 - Mangroves also frequently suffer from **oil spills**.

Conservation of Mangroves

- **UNESCO Designated Sites:** The inclusion of mangroves in **Biosphere Reserves, World Heritage sites and UNESCO Global Geoparks** contributes to improving the knowledge, management and conservation of mangrove ecosystems throughout the world.
- **International Society for Mangrove Ecosystem (ISME):** The ISME is a **non-governmental organization** established in **1990** to promote the study of mangroves with the purpose of enhancing their conservation, rational management and sustainable utilization.
- **Blue Carbon Initiative:** The **International Blue Carbon Initiative** is focused on mitigating climate change through the conservation and restoration of coastal and marine ecosystems.
 - It is coordinated by **Conservation International (CI), IUCN, and the Intergovernmental Oceanographic Commission-UNESCO (IOC-UNESCO)**.
- **International Day for the Conservation of the Mangrove Ecosystem:** **UNESCO** celebrates this day on **July 26** with the aim of raising awareness about mangrove ecosystems and promoting their sustainable management and conservation.
- **Mangroves for the Future Initiative:** **IUCN and UNDP** developed a unique initiative to promote investment in coastal ecosystem conservation called the “**Mangroves for the Future (MFF)**”.
 - The member nations include **Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand, and Vietnam**.
- **National Mangrove Committee:** The **Government of India** set up a **National Mangrove Committee in 1976** which advises the government about the conservation and development of mangroves.

46. Blackbuck

Section: Species in news

Context: The blackbuck population has increased threefold in Odisha’s Ganjam district, the only habitat of the most elegant member of the antelope family in the state, over 12 years.

More on the News:

- Blackbucks were sighted in the Balukhand-Konark wildlife sanctuary in the Puri district through 2012-13; however, they have now vanished from the area.
- **Improvement of habitats and protection by the local people** and forest staff are some of the reasons behind the increase of the blackbuck population in the district.
- Not a single poaching case has been reported in the last few years in the area.
- Like the **Bishnoi tribe community** of western Rajasthan and the **Vala Rajputs of Saurashtra**, the people of Ganjam district in Odisha protect the blackbuck, as its sightings are considered an indicator of good luck.

Blackbuck

- Indian Blackbuck (Antelope cervicapra) is an **antelope** and is the only living species of the genus Antelope.
- It is considered to be the **fastest animal in the world next to Cheetah**.
- The blackbuck is a **diurnal antelope** (active mainly during the day).
- It has been declared as the **State Animal of Punjab, Haryana, and Andhra Pradesh**.
- **Habitat:**
 - Blackbuck **inhabits grassy plains** and slightly forested areas.
 - It is found in Central- Western India (MP, Rajasthan, Gujarat, Punjab, Haryana, Maharashtra and Odisha) and Southern India (Karnataka, Andhra Pradesh, and Tamil Nadu).
- **Protection Status:**
 - **Wildlife Protection Act 1972:** Schedule I
 - IUCN Status: Least Concern
 - CITES: Appendix III
- **Conservation:**
 - The **Bishnoi community of Rajasthan** is known worldwide for their conservation efforts to blackbuck and Chinkara.

47. As a heatwave spectre hangs again over India's wheat harvest, its home-grown crop simulation model can help

Section: Agriculture

Context: InfoCrop, available for free on IARI's website, can forecast climate impact on farm yield in real time.

More on the News:

- Currently, the country **does not have a system to forecast crop loss** due to heatwaves or most other extreme weather conditions. The Mahalanobis National Crop Forecast Centre, under the Union Ministry of Agriculture and Farmers Welfare, **provides pre-harvest forecasts for eight major crops** at the national, state and district levels.
- The agency also puts **out forecasts accounting for drought events**, but **not for other extreme weather conditions**. Besides, the agency forecasts with static crop models, which cannot factor in real-time changes.
- The IARI scientists, in contrast, used **InfoCrop** version 2.1, India's only dynamic crop simulation model developed and released by the institute in 2015 to **study the long-term impact of climate change and crop management practices on yield**.
- The model has an **85 per cent accuracy rate**, which is on par with widely used dynamic models such as the Decision Support System for Agrotechnology Transfer model, developed by the US, and Agriculture Production Systems sIMulator, developed by Australia.
- InfoCrop is **more suited for India as it has the life cycle data** for almost all the local varieties of 11 crops: paddy, wheat, maize, sorghum, pearl millet, pigeon pea, chickpea, soybean, groundnut, potato and cotton.

InfoCrop

- InfoCrop is a process based **dynamic simulation model for simulating growth**, development and yield of rice, wheat, maize, sorghum, pearl millet, mustard, soybean, chick pea, pigeon pea, potato and cotton.
- It simulates the **effects of weather, soil and crop management** (sowing, seed rate, organic matter nitrogen and irrigation) and **pests**. It **provides daily and summary outputs** on various growth and yield parameters, nitrogen uptake, greenhouse gas emissions, soil water and nitrogen balance. It is used for several applications including yield forecast and climate change studies. It is known to perform better for tropical regions.

48. Industrial aerosols contribution to global cooling

Section :Pollution

Context: How much do industrial aerosols contribute to global cooling? New study offers clues.

More on the News:

- Inactive volcanoes **contributed 66 per cent of sulphate emissions**, known to cool the planet, in the preindustrial era, suggesting they were more abundant than previously estimated, a new study reveals.
- Sulphate emissions can be traced back to **natural sources such as volcanoes and industrial processes, including oil combustion, traffic emissions and coal burning**.
- Sulphur dioxide, released from natural as well as anthropogenic sources, **reacts with water vapour and other gases in the atmosphere to create sulphate aerosols**.
- They can **cool the planet by reflecting sunlight into space**, according to the United States National Aeronautics and Space Administration. They also **form clouds**, which also tend to have a cooling effect.
- A higher abundance of sulphate aerosols in the preindustrial atmosphere means anthropogenic sulphate has a relatively small cooling effect.
- Previous studies estimated that the amount of sulphur dioxide released by volcanoes is smaller than by anthropogenic sources.
- Climate models **do not consider hydrogen sulphide**, which escapes from inactive volcanoes. These gases react with oxygen to produce sulphur dioxide within three days, forming sulphate aerosols.
- **The new study estimates hydrogen sulphide emissions from volcanoes**, suggesting that this gas was likely to contribute to atmospheric sulphate in the preindustrial era significantly.
- The team also wants to investigate sulphur emissions from other sources, such as phytoplankton (tiny marine algae). Marine phytoplankton **emits dimethylsulphide**, an **organic sulphur-containing compound** that produces sulphur aerosols.

Aerosol

- Aerosols are defined as a **combination of liquid or solid particles suspended in a gaseous or liquid environment**.
- **"Primary" aerosols**, like dust, soot, or sea salt, **come directly from the planet's surface**. They get lifted into the atmosphere by gusty winds, shot high into the air by exploding volcanoes, or they waft away from smokestacks or flames.
- **"Secondary" aerosols form when different things floating in the atmosphere** like organic compounds released by plants, liquid acid droplets, or other materials—crash together, culminating in a chemical or physical reaction.
- Aerosols come **from both natural and human sources**.
- Natural sources of aerosols include sea salt generated from breaking waves, mineral dust blown from the surface by wind, and volcanoes.

- Anthropogenic aerosols include sulfate, nitrate, and carbonaceous aerosols, and are mainly from fossil fuel combustion sources.

About Aerosols:

- Aerosols are a **mixed bag of substances, liquid and solid**, that differ from their gassy brethren.
- They tend to hang in the atmosphere near their source, or move as localised or regional masses via air currents.
- They **range in size from a few atoms across to the width of a human hair**.
- They include:
 - crystals of sulphate,
 - balls of almost pure black carbon (commonly, though not entirely accurately, called soot),
 - droplets of nitric or sulfuric acid, spores of pollen.
- They may be salt freed from the crests of breaking waves, or desert sand whipped up by the wind.
- **Natural Aerosols:** One of the **largest natural sources of aerosols are plankton, which breathe out dimethyl sulphide (DMS)**, a strong-smelling chemical that gives the sea its familiar pungent odour.
 - DMS reacts with oxygen to produce clouds of sulfuric acid.
 - Sulphur dioxide released by volcanoes does the same.
- **Ninety percent of aerosols in the atmosphere are naturally occurring**, but their levels have remained relatively constant over time.
- **Anthropogenic Aerosols:** On the other hand anthropogenic, or human-made aerosols are emitted from:
 - vehicle exhausts;
 - the smokestacks of factories,
 - ships and coal-burning powerplants;
 - by farmers burning field stubble and land grabbers clearing Amazon forest with fire;
 - by gas flares on oil rigs and discarded plastic shopping bags.
 - Even tumble driers release microplastic fibres that float skyward.
- These sources have increased dramatically over the industrial period, roughly in step with greenhouse gases.
- Most aerosols **help cool the planet by reflecting sunlight back out into space**, reducing the amount of radiant energy that reaches Earth's surface.
- They also help create clouds or brighten existing clouds, by acting as condensation nuclei around which water vapor condenses.
- Aerosols first came to public attention in the 1970s, not so much because of their cooling impact, but due to **acid rain**.
- The worst aerosols are very fine particulates that can **penetrate deep into the lungs** and may even enter the blood stream exacerbating respiratory and cardiovascular conditions.

49. Himalayan plunder: Ecology changing for the worse due to loss of forest cover, drying springs

Section: Ecosystem

Context: Whether caused by natural forces or due to human activities, land subsidence, landslides, soil erosion, drying springs and changing river courses **have relegated the Himalayan ecology from being pristine to perishing and deforestation** and drying up of springs appear to be the major contributors to these natural hazards.

More on the News:

- A **decline of 902 square kilometres in forest cover** was recorded in hill districts of the country as compared to 2019, found the State of Forest Report, 2021. The loss is much more pronounced in the **Himalayan states** that reported an **overall loss of 1,072 sq km of forest cover**.
- **Western Himalayas'** dense forest cover will **decrease from 61 per cent in 2000 to 16.8 per cent in 2100**; and in eastern Himalayas from **2 per cent in 2000 to 38.7 per cent** in 2100, said the study.
- **Unplanned urbanization, commercial timber extraction, capitalistic development projects, mining and quarrying** were identified as the troublesome forces of modern development.
- One such grievous **impact of deforestation is soil erosion**. In the Himalayan region, the impact of soil erosion can be felt differently in the western and eastern parts.
- Due to **higher rainfall in the northeastern hills** as compared to the northwestern hills the former is **more vulnerable to soil erosion**—22.3 per cent of the area as compared to 12.6 per cent of the area respectively.
- The other trend changing the Himalayan ecology is the **drying of springs**. The Indian Himalayan region is **home to three million of the five million springs** across the country. And even those are under threat.
- Any change in spring hydrology has **clear ramifications on river hydrology**, whether in the **headwater regions**, where springs manifest themselves as sources of rivers or in the **lower-reach plains of river systems** where they contribute almost invisibly as base flows to river channels.
- Depletion has meant disturbances in the **water security inside forests and national parks and their fringe areas as well**.

- Therefore, a changed Himalayan landscape caused by human activities and warming means **transformed natural ecosystems through biological invasions and reduced native biodiversity**.

Carrying capacity

Carrying capacity is the maximum number, density, or biomass of a population that a specific area can support sustainably. This likely varies over time and depends on environmental factors, resources, and the presence of predators, disease agents, and competitors over time.

50. Debt-for-nature swaps

Section: Climate Change

Context: With many developing nations facing a triple whammy of rising debt loads, climate change and nature loss, conservationists say the answer could lie with a financial instrument enabling them to tackle all three at once: “debt-for-environment swaps”.

More on the News:

- The **world’s poorest countries owe \$62 billion in annual debt service**, a year-on-year increase of 35%, the World Bank said in December, warning of a rising risk of defaults.
- But even as debt burdens grow, there is now **an urgent need for countries to invest more in climate and biodiversity protection** to meet their international and national commitments.
- In a bid to deal with these problems across the board, Portugal and Cape Verde **sealed an agreement for a “debt-for-nature” swap last month**, just days after Zambia said it too was looking at a similar proposal from green group WWF.
- These types of debt swap are likely to increase in the coming years, analysts predict – with Ecuador and Sri Lanka also reportedly exploring similar deals.

What are green debt swaps and how do they work?

- Debt swaps are one way to change the terms of a country’s borrowing – with bilateral government lenders, development finance institutions or private banks – **either by giving states more time to repay loans or reducing interest rates** and the amounts they must pay back.
- With the agreement of creditors, **debt swaps can help the world’s low-income countries avoid default and enable them to redeploy part of their debt repayments** to invest in measures to tackle climate change, nature protection, health or education.
- For creditors, debt swaps can reduce their risk through additional guarantees and ensure that at least part of a loan is eventually repaid.

Who is pushing debt-for-nature swaps and why?

- **Developing nations that are struggling to pay back creditors or defaulting on their debt** – and thus cannot invest in greening their economies and protecting their rich biodiversity – are pushing for these swaps.
- Egypt presented a swap with Germany as a model for others seeking to raise money for clean energy projects when it hosted the U.N. climate summit.
- **Multilateral development banks** also see potential in green debt swaps.

How can green debt swaps be encouraged?

- A **global framework or standard that sets the rules for green debt swaps** would enable more creditors to join such initiatives and help increase the size of deals.
- A **public campaign**, similar to the huge push to cut debt and poverty in the 1990s and 2000s, could also help.

51. Farmers accuse a pesticide production company for distorting their crops

Section: Pollution

Context: Cotton farmers of Bharuch district in Gujarat have accused Meghmani Organics Limited for causing deformities and distortions to their crops.

More on the News:

- During the cotton farming season of 2021, over 18000 farmers from 280 villages of Bharuch district suffered from economic losses due to crop damage, covering thousands of acres of land.
- They say that the **excessive production of a herbicide called 2,4-Dichlorophenoxyacetic acid is distorting the growth** of leaves and the plant.
- Losing faith in the state authorities, the **farmers have filed a petition in the Gujarat high court** against the state bodies and the private company, demanding compensation and remedial action which they are still awaiting.

2,4 Dichlorophenoxyacetic acid

- 2,4 Dichlorophenoxyacetic acid, commonly known as 2,4-D, is a **herbicide** that is widely used in agriculture, forestry, and lawn care to control broadleaf weeds.

- It is a synthetic compound that **belongs to the group of phenoxy herbicides**, which also includes other herbicides such as 2,4,5-T and MCPA.
- It is registered **for use in terrestrial and aquatic environments**
- It is a plant growth regulator, **and mimics auxin, the natural plant growth hormone**. Unlike auxin, which regulates, 2,4-D stays within plant tissues in high quantities and does not fluctuate. As a result, it causes **rapid cell growth and plants die** when their transport system is blocked and destroyed by abnormally fast growth.
- The herbicide **is effective against many types of broadleaf weeds**, but has little to no effect on grasses.
- 2,4-D has been in use since the 1940s and is one of the most widely used herbicides in the world.
- In high doses, 2,4-D can be toxic to humans, **causing skin and eye irritation, respiratory problems**, and other health issues. Some studies show that 2,4-D is possibly a **carcinogen** and an endocrine disruptor in humans.
- It can also **contaminate water and harm aquatic ecosystems**.
- On May 14 2020, the government of India had **released a draft order prohibiting the import, manufacture, sale, transport, distribution** and use of 27 insecticides. 2,4-D was in the list.

52. Green finance

Section : Climate change

Context: Green finance is fast emerging as a priority for public policy.

Green finance

- Green finance refers to the **financial arrangements** that are specific to the use for projects that are **environmentally sustainable or projects** that adopt the aspects of climate change. Environmentally sustainable projects include the **production of energy from renewable sources** like solar, wind, biogas, etc.; **clean transportation** that involves lower greenhouse gas emission; **energy efficient projects** like green building; waste management that includes recycling, efficient disposal and conversion to energy, etc.
- Moreover, project defined sustainable under the disclosure requirement for Green Debt Securities include **climate change adaptation, sustainable waste and water managements**, sustainable land use including sustainable forestry and agriculture, and biodiversity conservation (SEBI 2017).
- In order to meet the financial needs for these types of projects, new financial instruments such as green bonds; carbon market instruments (e.g. carbon tax); and new financial institutions (e.g. green banks and green funds) are being established. They together constitute green finance.
- Rapid economic development is often achieved at the cost of environment. Dwindling natural resources, degraded environment and rampant pollution are hazardous to public health and pose challenges to the sustainable economic growth.
- In order to protect and substantially improve the environment, nations around the world have been increasingly focusing on the use of eco-friendly technologies. However, it requires **appropriate incentive structure for increased allocation of funds** towards setting up or adopting environmentally sustainable projects.

Public Policy towards Green Finance

1. International best practices

- Major flagship programmes like Principles for Responsible Investment (PRI), Equator Principles (EP) for financial institutions, **United Nation's Environment Programme (UNEP)** and Statement of Commitment by financial institutions on sustainable development suggest ways for implementing green finance among the signatories. Several entities from India are signatory to these programmes.
- Sustainable Stock Exchange is an initiative that recommends the signatory countries' **stock exchanges to come up with stock price indices** that track the stock performance of a set of companies operating in these countries, which are leaders in recognising the Environmental, Social and Governance (ESG) principles into their financing aspects.

2. Public policy in India

- India has started emphasizing on green finance as early as 2007. In 2008, The **National Action Plan on Climate Change (NAPCC)** was formulated with a vision to outline the broad policy framework for mitigating the impact of climate change.
- The **Climate Change Finance Unit (CCFU)** was formed in 2011 within the Ministry of Finance as a coordinating agency for the various institutions responsible for green finance in India.
- Security and Exchange Board of India (SEBI) made it **mandatory for top 100 listed entities** based on market capitalisation at BSE and NSE to **publish annual business responsibility reports** since 2012 and revised it from time to time.
- In May 2017, **SEBI issued guidelines for green bond issuance** specifying the disclosure requirements.
- In addition, the **Ministry of Corporate Affairs imposed mandatory reporting of the progress on Corporate Social Responsibilities (CSR)** under the Companies Act, 2013.
- In October 2017, Report of the Committee on Corporate Governance has proposed that the board of directors shall meet at least once a year to specifically discuss strategy, budgets, board evaluation, risk management, ESG and succession planning.

- **Incentives/Subsidy**

- The Government of India (GoI) **offers 30 per cent of the installation cost** of the rooftop solar panels as **subsidy** to the institutional, residential and social sectors in most states. In some of the special category states, the subsidy is up to 70 per cent of the installation cost.
- In addition, beneficiaries can avail a generation-based incentive wherein they can receive **₹ 2 per unit of generation**, if the generation exceeds 1100kWh-1500kWh per year. Further, the **excess power can be sold at a tariff set by the government**.
- GoI launched **two phases of Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)** scheme in 2015 and 2019, to enhance the flow of credit, reducing the up-front purchase price of all vehicles and developing the infrastructures (such as charging stations) to encourage green vehicle production and sales.
- In order to counter the high up-front cost of such vehicles, the **State Bank of India has introduced a 'green car loans' scheme for electric vehicles** with 20 basis points lower interest rate and longer repayment window, compared to the existing car loans .
- The Government has also brought in a **Production Linked Incentive (PLI) Scheme for manufacturing of high efficiency modules** in the arena of renewable energy.
- RBI has included the **small renewable energy sector under its Priority Sector Lending (PSL)** scheme in 2015. Under this scheme, firms in renewable energy sector are eligible for **loans upto ₹ 30 crore** (increased from ₹ 15 Crore since September 4, 2020) while the households are eligible for loans upto ₹ 10 lakh for investing into renewable energy.
- Reserve Bank has mentioned the findings of the G20 Green Finance Study Group (GFSG14) on the **need for development of local green bond markets, facilitating cross-border investments in green bonds**, knowledge sharing on environmental risks, and improving overall green finance activities. The annual report further mentions definition of green activities, aspects of intellectual property rights in development and transfer of technology from developed countries, and environmental risk assessment by the banks.
- In the context of green financial institutions, **Indian Renewable Energy Development Agency (IREDA)**, a government-backed agency for promoting clean energy investments, announced plans to **become India's first Green bank** in May 2016.
- **India Infrastructure Finance Corporation Limited (IIFCL)** also launched a dedicated scheme known as the **'credit enhancement scheme'** for funding viable infrastructure projects with bond tenors above five years.

Progress of Green Finance in India

- **Green lending**
 - As at end-march 2020, the aggregate **outstanding bank credit to the non-conventional energy sector** was around ₹36,543 crore, **constituting 7.9 per cent of the outstanding bank credit** to the power generation compared to 5.4 per cent in March 2015.
- **Green bonds**
 - Green bonds are the bonds **issued by any sovereign entity**, inter-governmental groups or alliances and corporates with the aim that the proceeds of the bonds are utilised for projects classified as environmentally sustainable
 - India started **issuing green bonds since 2015**. As of February 12, 2020, the **outstanding amount** of green bonds in India was **US\$16.3 billion** India issued green bonds of about US\$8 billion since January 1, 2018, which constituted about **7 per cent of all the bonds** issued in the Indian financial market.
 - Around 76 per cent of the green bonds issued in India since 2015 were denominated in US\$.
 - Most of the green bonds issued since 2015 had maturities of five years or above, but less than 10 years.

Challenges in Green Finance

- RBI acknowledges the **challenges** in the development of green finance, such as **"greenwashing" or false claims of environmental compliance, plurality of definitions, maturity mismatches** between long-term green investment and short-term interests of investors.
- **Borrowing costs:** The cost of issuing green bonds has generally remained higher than the other bonds in India. It may be mentioned that **most of the green bonds in India are issued by the public sector units** or corporates with better financial health.

53. G20 for greater climate finance support for farmers, suggests incentives

Section: Climate Change

Context: The G20 meeting also discussed the impact of climate change on agriculture and its productivity.

- The G-20 members have stressed on the need to boost climate finance to support farmers who make an effort to mitigate the adverse impact of climate change on the farm sector
- farmers can be financially incentivised if they adopt climate-friendly farming or green agriculture.
- The carbon farming programme in the country has been initiated by a private entity Grow Indigo, a joint venture between seed major Mahyco and US-based Indigo

- Farmers who adopt farming techniques – **direct seeded rice**, which improves **water use efficiency** and **no tillage practice** which conserves soil organic biomass, prior to planting of paddy could register for the programme for getting **carbon credit**.
- India shared the measures taken towards ‘climate smart agriculture’ like mapping the vulnerable areas and conducting research in the meet.
- On the issue of food security and nutrition, agriculture secretary Ahuja said, there was a discussion on achieving one of the Sustainable Development Goals (SDG) of ‘zero hunger’ by 2030.

Carbon farming :

Carbon farming (also known as carbon sequestration) is a system of agricultural management that helps the land store more carbon and reduce the amount of greenhouse gases that it releases into the atmosphere. Sustainable forest management practices do similar good by minimizing greenhouse gases and accumulating carbon dioxide in wood. For example, Indian agriculture producers can manage their grazing lands to conserve and restore vegetation, including tree cover along waterways. This practice helps the land store carbon and remove greenhouse gases from the atmosphere, as well as provides benefits to nearby water sources. Landowners can also implement fertilizer reduction strategies, such as applying compost or biochar (charcoal used as a soil additive to improve crop yield), that reduce the amount of greenhouse gases tied up in vegetation.

Carbon farming is a system of agricultural management that helps the land accumulate and store more greenhouse gases instead of releasing those gases into the atmosphere.

Common Methods

Forest Management

Healthy forests absorb and hold carbon dioxide emissions produced from other sources and are an important source of greenhouse gas (GHG) sequestration. Carbon offsets can be created through a variety of strategies including: avoided deforestation and permanent land conservation, reforestation and replanting activities, and improved forest management and stewardship in working forests where harvesting occurs. Improved forest management focuses on long-term, sustainable practices to ensure that forests continue to remove CO₂ from the atmosphere since deforestation accounts for between 15 and 20 percent of the global increase in GHG levels. Activities include thinning out, selective harvest, regeneration and planting, and fertilization to enable productive and sustainable forest growth.

Grasslands Conservation

Similar to forestry, native grasses and other vegetation provide a natural source of greenhouse gas (GHG) absorption and sequestration. Carbon offsets from this category focus on maintaining native plant life through permanent land conservation and avoided conversion for commercial development or intensive agriculture.

Renewable Energy Production

Renewable energy facilities, such as wind or solar, generate carbon offsets by displacing fossil fuel-based electricity production sources within the power grid. The carbon offsets derived from a certified third-party project generates the carbon credit, which is owned by the entity that develops the project..

54. Lead poisoning

Section: Pollution

Context: Lead poisoning is a huge public health concern for India.

More on the News:

- Half the children in India report **high blood lead levels**, reveals a 2020 report by the UN Children’s Fund (UNICEF) and Pure Earth, a US-based environmental health non-profit.
- In terms of average blood lead levels among the population, **some 23 states exceed the 5 µg/dL margin**.



Lead:

- Lead is a **naturally occurring element** and is found in the earth's crust.
- It is usually found in combination with other elements, such as sulfur and oxygen, in the form of lead sulfide or lead oxide.
- Lead is also found in **small amounts in the air, soil, and water**.
- It is **highly malleable and ductile**, meaning it can be easily shaped and stretched into thin wires.
- It is also **highly resistant to corrosion**, making it useful in plumbing and other applications where it may be exposed to water or other corrosive substances.
- However, lead is **highly toxic and can cause a range of health effects**, particularly in children and pregnant women.

Source of Lead Pollution:

Everyday risks	
There is potential for lead exposure in several common occupations and products that are used in nearly every household	
OCCUPATIONAL SOURCES	Non-Occupational Sources
Battery work	Traditional medicine
Mining	Vehicular exhaust
Glass manufacturing	Contaminated cosmetics and sindoor
Automobile repair	Household storage batteries
Ceramic work	Household paints
Painting	Contaminated spices
Pottery	Effluent from lead-based industries
Smelting	Contaminated soil, dust and water near lead-based industries
Printing work	Food grown in lead contaminated areas
Plumbing	Retained bullets
Soldering	Food stored or cooked in lead-coated vessels
Making lead pipes and plastic	Painted toys

Source: "Assessment of Lead Impact of Human and India's Response", Niti Aayog and Council of Scientific Research

Effects of Lead Pollution

- **Health effects:** Lead exposure can cause a range of health effects, including damage to the **central nervous system, developmental delays, cognitive impairment, and anemia**. Lead exposure can also affect the **cardiovascular, renal, and reproductive systems**. **Children and pregnant women are particularly vulnerable** to the health effects of lead exposure.
- **Environmental effects:** Lead pollution can harm plants, animals, and ecosystems. Lead can **accumulate in soil and water, and can be toxic to plants and animals**. Lead pollution can also affect the quality of aquatic ecosystems, and can contribute to the decline of fish and other aquatic species.
- **Economic impacts:** Lead pollution can have economic impacts, including costs associated with healthcare and **lost productivity due to lead-related illnesses**. The costs of cleaning up lead-contaminated sites and replacing lead-based products can also be significant.

- **Social impacts:** Lead pollution can disproportionately **affect disadvantaged communities**, who may be more likely to live near sources of lead pollution, such as industrial sites or highways. Children in these communities may be at higher risk of lead exposure and the associated health effects.

Global initiatives to end Lead Pollution

- **United Nations Environment Programme (UNEP) Global Alliance to Eliminate Lead Paint:** This initiative aims to eliminate lead paint in all countries by 2020. The initiative provides technical and financial support to countries to help them phase out lead paint.
- **World Health Organization (WHO) Childhood Lead Poisoning Prevention Programme:** This initiative focuses on preventing childhood lead exposure and improving the diagnosis and treatment of lead poisoning. The WHO also works to raise awareness of the dangers of lead exposure and promote the use of lead-free products.
- **The Partnership for Clean Indoor Air (PCIA):** The PCIA is a global alliance of public, private, and non-governmental organizations that work to **reduce indoor air pollution**. The PCIA provides technical assistance, training, and resources to help countries and organizations transition to cleaner, safer energy sources.
- **The Global Battery Alliance:** This initiative aims to **promote sustainable battery production and use**, including the **responsible recycling of batteries to prevent lead pollution**. The alliance brings together stakeholders from across the battery value chain to collaborate on sustainable solutions.
- **The Basel Convention:** The **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal** is a global treaty that aims to minimize the generation of hazardous waste and prevent its transboundary movement. The convention **includes provisions for the environmentally sound management of lead waste** and the prevention of lead pollution.

India's initiatives to end Lead Pollution

- **National Programme for Prevention and Control of Fluorosis and National Programme for Prevention and Control of Lead Poisoning:** These programs were launched by the Ministry of Health and Family Welfare to prevent and control fluorosis and lead poisoning in high-risk areas. The programs focus on **providing safe drinking water, promoting hygiene and sanitation**, and conducting health education campaigns to raise awareness of the health effects of lead exposure.
- **Bureau of Indian Standards (BIS) lead-free certification mark:** In 2017, BIS introduced a new certification mark to indicate that products are lead-free. The mark is intended to help consumers identify lead-free products and promote the use of safer alternatives.
- **Extended Producer Responsibility (EPR) framework:** India has implemented an EPR framework **for e-waste management**, which requires producers to take responsibility for the end-of-life management of their products. This framework helps **to prevent lead pollution from electronic waste**, which is a significant source of lead exposure in India.
- **The Ministry of Environment, Forest and Climate Change (MOEFCC) has passed a notification** as “**Regulation on Lead contents in Household and Decorative Paints Rules, 2016**” and has prohibited manufacture, trade, import as well as export of household and decorative paints containing lead or lead compounds in **excess of 90 Parts Per Million (PPM)**.
- In 2022, the Union Ministry of Environment, Forest and Climate Change notified the **Battery Waste Management Rules, 2022**. The new rules aim at reducing share of battery recycling in the informal sector and stress on extended producer responsibility.

55. Cold Desert Cultural Landscape of India

Section :Places in news

About Cold Desert Cultural Landscape:

- The Cold Desert Cultural Landscape of India is **situated in the Himalayas** and stretches from **Ladakh (J&K)** in the north to **Kinnaur (H.P.)** in the south.
- The region constitutes a **Cold Desert biome** with **harsh climatic conditions**, which can be attributed to two factors.
 - One is its location on the **leeward side of the Himalayas**, which makes it a **rain-shadow zone inaccessible to the annual south eastern monsoon winds** that sweep the rest of the country, thus **creating desert conditions** with low levels of precipitation.
 - Second is its **very high elevation** (ranging from 3000 – 5000m ASL) that **adds to the coldness** in its environment.
- **A huge seasonal variation is seen in the climatic conditions**, ranging from short and **dry summers with harsh sunlight** (max temperature reaching upto 36°C during the day) to long, **windy and freezing winters** (min temperature touching -32°C at night). **Blizzards, snowstorms and avalanches are common**.
- The **soil is not very fertile** and the climatic conditions allow very short growing seasons making it a bare landscape. Water resources are minimal and comprise glacier-fed streams.
- The settlements are **small, isolated, sparsely populated** and their planning a testament to the harsh terrain and environment. The population belongs predominantly to the **Indo-Mongoloid (Tibetan) race** with some parts of western Ladakh occupied by the **Dards**, who are intermediaries of Ladakhis and Baltis of the neighbouring Baltistan in Pakistan occupied Kashmir (PoK).

- Two distinct regions of human habitation and culture can be distinguished within this cold desert, namely (1) the **Leh-Kargil areas of Ladakh (J&K)** and (2) **Spiti Valley (H.P.)**.
- **Historical background of Ladakh**
 - Ladakh ('land of the passes') is **one of the most elevated** (2,900 m to 5,900 m msl), and **coldest regions** (from -30°C to -70°C) of the earth.
 - Its **topography is barren and population sparse inhabited along the river banks** of different valleys namely Indus, Nubra, Changthang, Zaskar and Suru.
 - The **mean annual precipitation is less than 50 mm**, received mostly in the form of snowfall during winters.
 - The region faces **fast blowing winds 40-60 km/hr** mainly in the afternoon hours.
 - The **soil moisture remains frozen** during winters and with low relative humidity during the summer months.
 - Despite such inhospitable conditions for survival, it is postulated that Ladakh has **been occupied by humans since pre-historic times**, as evidenced in the discovery of Lower Palaeolithic tools, Petroglyphs and other pre-historic art works that mark the beginning of man's interaction with this cold desert landscape.
- **Historical background of Spiti**
 - Spiti, is known as the 'middle country' that **lies between Tibet and India**.
 - Throughout history, it kept changing hands among the various kingdoms of Tibet, Ladakh, Kinnaur, Lahaul and Kullu. Subjugated to successive attacks and influences, many a times the **rulers had to pay attributes to one another to keep peace in the region**.
 - The archaeological records substantiate that the original inhabitants in these regions were also **pastoral nomads** who braved harsh climatic conditions of all sorts. For protection, they **defied the natural forces and elements, and began to worship them**. It is believed that this is how the Naga Cult (cult of snake worship) and others came into existence that revolve around the worship of natural features as tree, rivers, sun, moon et al.
 - The **river Spiti originates at the base of the Kunzam range** and flows eastward to **join the Sutlej** at Khab in Kinnaur.
 - The inhabitants are largely **dependent on agriculture, wild resources** such as Droh, Gandam (*Triticum aestivum*), Neh, Jau (*Hordeum himalayense*) and medicinal plants for their livelihood.
- **Cultural Heritage**
 - Almost all settlements in the property are **associated with Buddhist monasteries known as Gompas** with a trademark prayer flag fluttering on top. Built either on flat land or atop the neighbouring hillock depending upon local factors, **these shrines are the centers of the people's cultural life** and have influenced their religious beliefs for centuries.
 - The architecture of the region is an **interesting amalgamation of Indian and Tibetan influences**, and monastic buildings reflect a deeply Buddhist approach.
 - There are other architectural manifestations unique to this region. One is the **Chorten** ('receptacle of worship'), which are remarkable **types of stupas**, and the **Mani walls**, long and thick platform-like row of stones, about 1 to 1.25 m high and 1.25 m wide, faced with carved stones inscribed with holy mantras.
 - **Buddhist chanting of Ladakh**: recitation of sacred Buddhist texts in the Trans-Himalayan Ladakh Region, Jammu and Kashmir, has been **inscribed since 2012 as one of elements on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity**.
 - The **performing arts**: traditional dance including **mask dance**, theater, contemporary plays, folk music
 - **Craft-making techniques**: **thangkas**, **carpet weaving**, **pashmina** and marino shawls and local quilt weaving, prayer flags of cloth, gold, silver, bronze sculptures, copper objects, **wooden furniture including manuscript shelves**, stone, stucco and clay
 - **Customs**: **sacred paintings**, **agriculture farming**, kitchen-gardening, culinary, giving birth, wedding, death et al
 - **Rituals and beliefs**: folk stories, legends, classical and vernacular language, dialects, songs, poems, ancient scripts etc. are parts of cultural legacy and well-maintained intangible heritage traditions of the property.
- **Natural Heritage**
 - Region displays an **extremely fragile ecosystem** that shows a complex relationship of the climatic and geomorphological processes, and exhibits very less but **highly endemic diversity**.
 - Many rare and special varieties of flora and fauna are found here so much so that **many national parks and wildlife reserves have been declared** here by the Government for their protection.
 - Furthermore, the Cold Desert has been declared as the **16th Biosphere Reserve of India in 2009** that includes Pin Valley National Park and surroundings, Chandratol and Sarchu, and the Kibber Wildlife Sanctuary in H.P. The Changtang Cold Desert Wildlife Sanctuary in district Leh, **J&K is another protected habitat for flora and fauna** in the region. In H.P.
 - The region is home to a number of endangered species, including the **snow leopard, Himalayan brown bear, and Tibetan wolf**, as well as a range of unique plant species.

56. 12 African cheetah likely to land on Saturday

Section : Species in news

African Cheetah

- **IUCN status – Vulnerable**
- **CITES status – Appendix-I** of the List. This List comprises of migratory species that have been assessed as being in danger of extinction throughout all or a significant portion of their range.
- **Habitat** – Around 6,500-7,000 African cheetahs present in the wild.
- **Physical Characteristics** – Bigger in size as compared to Asiatic Cheetah.

Asian Cheetah

- **IUCN Status – Critically Endangered.**
- **CITES – Appendix I** of the list
- **Habitat** – 40-50 found only in Iran.
- **Physical Characteristics** – Smaller and paler than the African cheetah. Has more fur, a smaller head and a longer neck. Usually have red eyes and they have a more cat-like appearance.

Kuno National Park

- It was **established, in 1981, as a wildlife sanctuary** in the Sheopur and Morena districts. It was also known as Kuno-Palpur and Palpur-Kuno Wildlife Sanctuary.
- In **2018**, it was given the **status of a National Park**.
- It is part of the **Khathiar-Gir dry deciduous forests ecoregion**.
- The protected area is largely **dry, deciduous forest**.

57. Doomsday Glacier

Section: Climate change

Context: So-called Doomsday Glacier is ‘in trouble,’ scientists say after finding surprising formations under ice shelf.

More on the News:

- In two studies, published in the journal Nature, scientists revealed while the **pace of melting underneath much of the ice shelf is slower** than previously thought, **deep cracks and “staircase” formations in the ice are melting much faster**.
- Particularly **rapid melting happens at the point where the glacier meets the seafloor**, which has retreated nearly nine miles (14 kilometers) since the late 1990s, exposing a larger slice of ice to relatively warm ocean water.
- The **complete collapse of the Thwaites itself could lead to sea level rise of more than two feet (70 centimeters)**, which would be enough to devastate coastal communities around the world. But the Thwaites is also **acting like a natural dam** to the surrounding ice in West Antarctica.
- The scientists were also surprised by a second finding. They discovered an **underwater glacial landscape much more complex** than expected, **dominated by strange staircaselike terraces and crevasses** – big cracks going all the way through the ice shelf.
- Warm, salty water was able to funnel through and widen cracks and crevasses, contributing to instabilities in the glacier.
- **Melting along the sloped ice of the cracks and terraces may become the primary trigger for ice shelf collapse.**

Doomsday Glacier

- Thwaites Glacier, nicknamed the Doomsday Glacier, is an **unusually broad and vast Antarctic glacier**.
- It flows into Pine Island Bay, part of the Amundsen Sea, east of Mount Murphy, on the Walgreen Coast of Marie Byrd Land.
- Thwaites Glacier is **roughly the size of Florida** and is located in **West Antarctica**. Part of what holds it in place is an ice shelf that juts out onto the surface of the ocean. The shelf **acts like a cork, holding the glacier back on the land** and providing an important defense against sea level rise.
- Every year it sheds billions of tons of ice into the ocean, **contributing about 4% of annual sea level rise**.

57. Pangolins

Section: Species in News

Context: Over 1,200 pangolins trafficked in India in 5 years: Report

More on the News:

- International non-profit organisation TRAFFIC has reported that 50% of seizures included live pangolins and 40% involved pangolin scales, used as an ingredient in traditional medicine in China and Southeast Asia.
- **Odisha reported the maximum number of incidents**, with 154 pangolins in 74 seizures.
- They are **poached mainly for international markets in China and southeast Asia** for their scales, which are used as an ingredient in traditional medicines. **Pangolin meat is also considered a delicacy and consumed for its alleged medicinal properties.**
- An earlier analysis of illegal pangolin trade in India by TRAFFIC in 2018 reported poaching of nearly 6,000 pangolins between 2009 and 2017.

Pangolins

- Pangolins are among the most trafficked wild mammals globally.
- India is **home to two species**: the Indian Pangolin and the Chinese Pangolin.
- Indian Pangolin is a **large ant-eater** covered by 11-13 rows of scales on the back. A terminal scale is also present on the lower side of the tail of the Indian Pangolin, which is absent in the Chinese Pangolin.
- Pangolins acts as **both predator and prey**, feeding on insects and also preyed upon by other animals.
- Other than regulating the population of insects, the **pangolin is an ‘ecosystem engineer’** that **builds burrows** that help **circulate soil organic matter**, increase soil moisture and aeration, and affect plant community succession.
- **Habitat :**
 - **Indian Pangolin** is **widely distributed in India**, except the arid region, high Himalayas and the North-East. The species is also found in Bangladesh, Pakistan, Nepal and Sri Lanka.
 - **Chinese Pangolin** is found in the Himalayan foothills in Eastern Nepal, Bhutan, Northern India, North-East Bangladesh and through Southern China.
- **Threats to Pangolins in India:**
 - **Hunting and poaching** for local consumptive use (e.g. as a protein source and traditional medicine) and **international trade for its meat and scales** in East and South East Asian countries, particularly China and Vietnam.
- Protection Status
- IUCN Red List
 - **Indian Pangolin**: Endangered
 - **Chinese Pangolin**: Critically Endangered
- Both these species are listed **under Schedule I**, Part I of the Wildlife (Protection) Act, 1972.
- Both these species are listed **under appendix I of the CITES**, meaning they are most endangered.

58. The Global Climate Finance Architecture

Section : Climate Change

Context: Climate finance remains central to **achieving low-carbon, climate resilient development**. The global climate finance architecture is complex and always evolving. Funds flow through multilateral channels – both within and outside of the United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement financial mechanisms and increasingly through bilateral, as well as through regional and national climate change channels and funds.

Multilateral channels for climate finance

- Multilateral channels for climate finance are institutions and mechanisms that have been **established to mobilize and distribute financial resources** for climate change projects and programs in developing countries. These institutions operate at the international level and are typically funded by contributions from donor countries.
- **Global Environment Facility (GEF)**
 - GEF was **established on the eve of the 1992 Rio Earth Summit** to help tackle our planet’s most pressing environmental problems.
 - GEF is an **operating entity of the financial mechanism of the UNFCCC**, serving the same function for the Paris Agreement, with a long track record in environmental funding.
 - It is a **financial mechanism for five major international environmental Conventions**:
 - the Minamata Convention on Mercury,
 - the Stockholm Convention on Persistent Organic Pollutants (POPs),
 - the United Nations Convention on Biological Diversity (UNCBD),
 - the United Nations Convention to Combat Desertification (UNCCD)
 - the United Nations Framework Convention on Climate Change (UNFCCC)
 - As of December 2021, through the fourth, fifth, six and seventh Trust Fund, GEF had approved over 880 projects in the focal area of climate change amounting to USD 4.2 billion.
 - GEF also **administers the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF)** under the guidance of the UNFCCC COP. These funds support NAPs development and implementation
- **Adaptation Fund (AF)**
 - AF has been financed **through a 2% levy on the sale of emission credits** from the Clean Development Mechanism (CDM) of the **Kyoto Protocol**.
 - Now mandated to serve the Paris Agreement, a similar automated funding source from the new carbon market mechanism developed under the Paris Agreement is being set up.
 - Following agreement at COP26 in Glasgow, the **AF will receive 5% of the share of proceeds from the sale of emissions credits** under the new CDM-replacement mechanism (UNFCCC, 2021).
 - However, in times of low carbon prices, the **AF is increasingly reliant on developed-country grant contributions to stay afloat**.
 - Operational since 2009, total financial inputs amount to USD 1,160 million², with total cash transfers to projects of USD 522 million.
 - The **AF pioneered direct access to climate finance for developing countries through accredited National Implementing Entities** that are able to meet agreed fiduciary as well as environmental, social and gender standards,

as opposed to working solely through UN agencies or multilateral development banks (MDBs) as multilateral implementing agencies.

- **Green Climate Fund (GCF)**

- GCF of the UNFCCC was agreed at the Durban COP and became fully operational with its first projects approved at the end of 2015.
- Like the GEF, it serves as an **operating entity of the financial mechanism** of both the UNFCCC and the Paris Agreement and receives guidance by the COP. It is expected to become the primary channel through which international public climate finance will flow over time and is intended to **fund the paradigm shift towards climate-resilient and low-carbon development** in developing countries with a country-driven approach, and a **commitment to a 50:50 balanced allocation of finance to adaptation and mitigation**.
- The initial resource mobilisation process for the GCF raised USD 10.3 billion. However, the failure by the United States to fulfil USD 2 billion of its USD 3 billion contribution agreement, in addition to exchange-rate fluctuations, means that only USD 7.1 billion were ultimately available.

- **Standing Committee on Finance**

- At COP16, the **Standing Committee on Finance** was established under the UNFCCC to **assist the COP in meeting the objectives of the Financial Mechanism** of the Convention. The Standing Committee on Finance has been tasked with, among other things, **preparing a biennial assessment** of climate finance flows, the fourth of which was published in 2021 and details the finance flows from 2017–2018.

- **Climate Investment Funds (CIFs)**

- It is established in 2008 are **administered by the World Bank**, but **operate in partnership with regional development banks** including the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD) and the Inter-American Development Bank (IDB).
- The CIFs finance programmatic interventions in selected developing countries, with the **objective of improving understanding of how public finance is best deployed at scale to assist transformation of development trajectories**.

Multilateral development banks (MDBs)

- Multilateral development banks (MDBs) play a prominent role in delivering multilateral climate finance. Many have incorporated climate change considerations into their core lending and operations, and most MDBs now also administer climate finance initiatives with a regional or thematic scope.
- **World Bank**
 - World Bank's carbon finance unit has established the **Forest Carbon Partnership Facility (FCPF)** to explore **how carbon market revenues could be harnessed to reduce emissions from deforestation and forest degradation**, forest conservation, sustainable forest management and the enhancement of forest carbon stocks (REDD+).
 - It also manages the **Partnership for Market Readiness (PMR)**, aimed at **helping developing countries establish market-based mechanisms** to respond to climate change
 - **BioCarbon Fund**, which is a **public-private partnership** that mobilises finance for sequestration or conservation of carbon in the land use sector.
- **African Development Bank**
 - African Development Bank also finances enhanced climate finance readiness in African countries through the German-funded **Africa Climate Change Fund (ACCF)**, whose first projects were approved in 2015.
 - The African Development Bank is **also the Trustee for the Africa Renewable Energy Initiative (AREI)** and will house the AREI Trust Fund with expected USD 10 billion in resources.

Bilateral channels for climate finance

- A significant share of public climate finance is spent bilaterally and administered largely through existing development agencies
- **Germany's Internationale Klimaschutz initiative (IKI, international climate initiative)** has provided over EUR 4.5 billion **for more than 750 mitigation, adaptation, and REDD+ projects since its establishment in 2008**. The initiative is innovatively **funded partly through the sale of national tradable emission certificates**, providing finance that is largely additional to existing development finance commitments.
- **United Kingdom** has committed GBP 5.8 billion to its **International Climate Finance (ICF)** from 2016 through to 2021. In 2019, it announced a doubling of its investments to help developing countries to combat climate change in the period 2021–2026 to GBP 11.6 billion.
- **Norway's International Climate and Forest Initiative (NICFI)** has pledged USD 350 million each year since 2008 through bilateral partnerships, multilateral channels and civil society. Sizeable pledges have been made **for REDD+ activities in Brazil, Indonesia, Tanzania, and Guyana**.

Regional and national channels and climate change funds

- **Caribbean Catastrophic Risk Insurance Facility (CCRIF)** was established in 2007 through support of the World Bank and other development partners but is now also funded by premiums from developing countries. A 22 member-country risk pool, the CCRIF offers parametric insurance.

- **Amazon fund**

- The Amazon Fund is a **financial mechanism created by the Brazilian government** in 2008 to provide financial support for projects that help **to prevent, monitor and combat deforestation and promote the sustainable use of forests** in the Amazon biome.
- The Amazon Fund is **managed by the Brazilian Development Bank (BNDES)** in partnership with Brazil's Ministry of the Environment and receives financial contributions from international donors
- The Amazon Fund has **received financial contributions from a number of countries, including Norway, Germany, and the United Kingdom.**
- As of 2021, the fund has received approximately \$1.3 billion in donations, which has been used to support a range of projects, including the creation of protected areas, the strengthening of environmental monitoring and law enforcement, and the promotion of sustainable agriculture and forestry practices.

59. Rhododendrons

Section: Biodiversity

Context: Darjeeling and Sikkim Himalayas are home to more than one-third of all types of rhododendrons found in India, reveals the latest publication of the Botanical Survey of India (BSI).

More on the News:

- **Darjeeling and Sikkim Himalayas home to one-third (34%) of all Rhododendron types** comprise only 0.3% of India's geographical area but the region is. This highlights the ecological significance of the region as far as an **indicator species** like Rhododendron is concerned.
- They are facing a high **threat due to anthropological pressures and climate change**, according to scientists. The **Rhododendron edgeworthii**, with white campanulate flowers, **recorded a huge habitat decline** in both Darjeeling and Sikkim. **Rhododendron niveum**, with big purple flowers, found in the Lachung area of north Sikkim is **facing threats due to rampant constructions.**
- Rhododendrons **are indicator species as far as climate change is concerned** and have a prominent place in the botanical history of the country.

Rhododendron

- They are **native** to many regions of the world, including **Asia, Europe, North America, and Australia.**
- Rhododendron is a large genus of **flowering plants** and is found mainly in Eastern Himalayas, Western Himalayas and Nilgiris. Some plants of Rhododendron are **evergreen** and some are **deciduous** in nature.
- The species is found in **varied habitats from subtropical forests to alpine shrubs**, rhododendrons **range from dwarf shrubs to large trees.**
- The cold, moist slopes and deep valleys of the eastern Himalayas form a conducive habitat for the luxuriant growth of Rhododendron species and rich diversity in the North Eastern States.
- The species has been designated as the **State tree of Uttarakhand** and its blooming in the Garhwal Himalayas is celebrated as 'Phool Sankranti', a festival of flowers.
- Rhododendrons are **popular ornamental plants** and are often grown in gardens and parks.
- They have been **used in traditional medicine** for their medicinal properties. In some regions, the **bark, leaves, and flowers of these plants are used to treat a range of ailments**, including fever, headache, and inflammation.

60. Blue forests

Section: Climate Change

Context: 5 "blue forests" that are vital to life on Earth.

Blue forests

- "Blue forests" are **coastal and marine ecosystems**, including mangrove forests, seagrass meadows and tidal salt marshes.
- They play an **important role in protecting marine biodiversity** and supporting the livelihoods of coastal and island communities by providing habitats for fisheries, filtering water, guarding shorelines and creating opportunities for tourism and recreation.
- Blue forests also play a **vital role in addressing the impacts of climate change.** Such ecosystems are **highly efficient in storing and sequestering atmospheric carbon** in biomass and sediments, storing up to ten times as much carbon per unit area than terrestrial forests. The **ability of coastal vegetation to sequester carbon is called "blue carbon."**
- The **destruction of these ecosystems can release buried carbon into the atmosphere**, such as carbon dioxide. This further contributes to climate change, and reverses the climate adaptation and mitigation benefits they provide to local communities and the world at large.

Types of Blue forest:

- **Mangroves**

- Mangroves are **salt-tolerant trees and shrubs** which grow along coasts. They support a rich biodiversity and provide a nursery for fish and crustaceans. Mangroves also **act as a form of natural coastal** defence against storm surges, tsunamis, rising sea levels and erosion.
- Every hectare of mangrove forest represents an estimated US\$33–57,000 per year. They also **extract up to five times more carbon from the atmosphere than forests on land.**
- Refer <https://optimizeias.com/mangroves-3/>
- **Salt marshes**
 - Salt marshes are **found in bays and estuaries along tidal coastlines** in parts of the world where there is low-lying land and a temperate climate. They are important nesting and feeding grounds for birds, and their shallow, brackish waters provide shelter for fish, molluscs and crustaceans.
 - Research shows that salt marshes, together with mangroves, peatlands and seagrass beds, **store more carbon than all the world's on-land forests combined.**
- **Seagrass meadows**
 - Seagrasses are **marine flowering plants** found in shallow waters from the tropics to the Arctic Circle.
 - Seagrass meadows **protect coasts from erosion, store carbon and contribute to food security** by helping produce healthy fish stocks.
 - A powerful **nature-based solution to climate change**, even though they cover only 0.1 per cent of the ocean floor, **seagrasses store around 18 per cent of oceanic carbon.**
- **Rockweed**
 - Rockweed comprises several species of **macroalgae**, recognizable by their air-filled bladders, which allow them to float upright at low tide.
 - It is a **staple food** in some societies, and it is the **original source of iodine** – it is now being recognized as a sustainable resource with vast economic potential as part of the blue economy.
 - Commercial ventures like rockweed farming can create new economic opportunities, particularly for women in rural communities.
- **Kelp forests**
 - Kelp forests are **underwater ecosystems characterized by dense groupings of kelp**, which are **large brown algae** that can grow to be several meters long.
 - These forests are **found in cold, nutrient-rich waters** around the world, including along the coastlines of California, Australia, South Africa, and many other regions.

Blue Forest Project

- The Blue Forests Project is a **global initiative** focused on harnessing the values associated with coastal carbon and ecosystem services to achieve improved ecosystem management
- **Project objective:** promote **better coastal ecosystem management** by harnessing the values associated with carbon and ecosystem services.
- The project is an **initiative of the Global Environment Facility (GEF)** and is **managed by GRID-Arendal** on behalf of the UN Environment.
- Project sites include locations in Ecuador, Dominican Republic, Indonesia, Thailand, Kenya, Madagascar and Mozambique, United States, and the United Arab Emirates.
- At these sites with local partners, on-the-ground **activities include targeted research on carbon and ecosystem services, capacity building, and analysis of possible policy interventions.**
- The project also aims to **provide tools and set the stage for up-scaling and the replication of the blue forests approach** around the world.

61. Elephants are irreplaceable seed dispersers

Section: Species in news

Context: Indian elephants are optimal seed dispersers of three large forest trees in West Bengal.

More on the News:

- The dispersal of seeds far away from the parent tree maintains the high numbers of tree species in tropical forests. Trees **depend on their fruit-eaters for seed dispersal**, including elephants: the **seeds of fruits they consume pass through their guts, come out undigested with dung and germinate when conditions are right.**
- Using a combination of field data and theoretical modelling, **scientists find that no herbivore can replace Indian elephants as the optimal seed dispersers** of three large forest trees in West Bengal.
- Scientists at Bengaluru's Indian Institute of Sciences and Princeton University, USA, quantified the role of Indian elephants and other herbivores (including Indian gaur, cattle, monkeys and wild squirrels) in dispersing the seeds of three tree species – the **elephant apple tree** (*Dillenia indica*), the **slow match tree** (*Careya arborea*) and **chaplash**, a **jackfruit tree endemic** to north-eastern India (*Artocarpus chaplasha*) in Buxa Tiger Reserve, West Bengal.
- The team collated previous field data, including **camera-trapping and watching fruiting trees** to see what fruits and how many each herbivore ate, counting seeds in dung and testing how many germinated.

- Using this and available data from literature, they quantified aspects of seed dispersal such as the time that seeds spent in animals guts, the distance that the seed was dispersed and natural processes that killed dispersed seeds.
- Incorporating these into a probability-based model, the team's study published in Conservation Biology found that without elephants, the number of seeds that survived after dispersal decreased to between 26% and 72% for each of the three tree species if other animals fail to compensate for the elephants.
- Though compensatory fruit removal by other animals negated this pattern, seed dispersal distance still declined by 30% for elephant apple and 90% for chaplash.
- Elephants dispersed seeds between 40 and 50 km, far higher than gaur (10 km) and cattle and buffaloes (5 km).

62. Humpback Whales

Section : Species in news

Concept :

- Recent studies on **eastern Australian humpback whale population** have shown behavioural plasticity in mating strategies can increase a population's ability to cope with anthropogenic impacts.
- It was found that as male density increased over time, the **use of mating tactics shifted towards more males engaging in non-singing physical competition** over singing.
- **Humpback whales**
- **The humpback whale is one of the four species of baleen whales.**
- They are **large, toothless whales** that have baleen plates to filter their prey from seawater.
- They have streamlined bodies ranging from 6 to 33 m in length., reaching up to 17 m in length and over 30,000 kg in weight.
- Humpback whales **occur worldwide in all major oceans**. While they generally demonstrate a preference for continental shelf areas, they are also known to cross deep offshore waters, and spend time over and around seamounts in the open ocean.
- IUCN Status: **Least Concern**.

Migration

- **Humpback whales with the exception of the Endangered Arabian Sea population perform some of the longest migrations of any whale species**, swimming up to 10,000 km each year.
- They migrate because they feed and breed in very different places.
- In the Southern Hemisphere, humpback whales spend the summer in the cold waters of Antarctica, feeding on Antarctic krill, which are small shrimp-like crustaceans. Animals with a hard outer body made up of different sections e.g., crabs, prawns, barnacles. which live in large groups called swarms.
- In the wintertime, humpbacks migrate north to mate and give birth in warmer, sub-tropical waters.
- **The Arabian Sea humpback whales are the only sedentary whales in the world, feeding and breeding in the same area.**

63. Mudumalai Tiger Reserve

Section: Places in news

Context: The unusually wet weather last year meant that flowers bloomed early in the reserve and the wildlife had plenty to eat, but there could be some negative impact too.

More on the News:

- In 2022, the Nilgiris witnessed **one of the wettest years** recorded in the past 64 years: the **number of rainy days were also more**, according to the Nilgiris District Disaster Management Department.
- Due to the prolonged rain, **many flowering species have started to bloom early**, say botanists.
- The rain has helped a lot in **increasing the water table**. It has **kept forest fires at bay**. Many **wild animals have started to breed** due to the plentiful fodder for the herbivores and prey for the carnivores. Birds have started nesting too.

Mudumalai Tiger Reserve

- Mudumalai National Park is a national park in the **Nilgiri Mountains** in Tamil Nadu, south India.
- It **shares boundaries with the states of Karnataka and Kerala**.
- It was a **declared tiger reserve** in 2007.
- It is a **part of Nilgiri Biosphere Reserve** (1st Biosphere Reserve in India) along with Wayanad Wildlife Sanctuary (Kerala) in the West, Bandipur National Park (Karnataka) in the North, Mukurthi National Park and Silent Valley in the South.
- It is bordered in the **north by Bandipur National Park**, in the east by Sigur Reserve Forest and in the west by **Wayanad Wildlife Sanctuary**. In the south, it is bordered by Singara Reserve Forest.

- The **Moyar River and its tributaries drain this area**, and several artificial waterholes provide drinking water for wildlife during dry seasons.
- The river Moyar, which flows along the Tamil Nadu-Karnataka border, **divides the two states**. The Park is bisected by the Mysore-Ooty highway, which follows the direction of the Moyar River, which divides Mudumalai and Bandipur.
- Flagship Species: **Tiger and Asian Elephant**.
- The **Reserve has tall grasses, commonly referred to as 'Elephant Grass'**.
- Tropical Evergreen Forest, Moist Mixed Deciduous Forest, Moist Teak Forest, Dry Teak Forest, Secondary Grasslands, Shrubs, and Swamps are among the habitats found here.

64. Harike wetland

Section: Places in news

Context: Migratory bird arrivals at Punjab's Harike wetland decline this season, latest census shows.

More on the News:

- The **arrival of migratory birds** this year to Harike, northern India's largest wetland, **declined 12% from 2021**, according to the latest census of these water birds.
- Every winter, 90 species of migratory birds from Siberia, Mongolia, Kazakhstan, Uzbekistan and Russia, among others, arrive at the wetland site once the water bodies in their native places start to freeze.
- Punjab witnessed fewer migratory bird arrivals at all wetlands this year.

Harike wetland

- The Harike Wetland, **one of the largest in northern India**, is situated in Tarn Taran district & and Ferozepur district of **Punjab**.
- The Harike Wetland **stands on the confluence of the the Beas and the Sutlej**. It is home to birds visiting from as far as the Arctic and Siberia.
- It was **accorded as a wetland in 1990**, by the Ramsar Convention, as **one of the Ramsar sites** in India, for conservation, development and preservation of the ecosystem.
- In addition to its ecological importance, the Harike Wetland is also an important **source of fish for local communities**. The wetland supports a significant population of fish species, including catfish, rohu, and common carp.

Convention on the Conservation of Migratory Species

- The Convention on the Conservation of Migratory Species of Wild Animals (CMS), also known as the **Bonn Convention**
- It is an **international agreement aimed at the conservation of migratory species** and their habitats.
- The CMS was signed in Bonn, Germany in 1979 and entered into force in 1983.
- The CMS aims to **coordinate and collaborate efforts to conserve migratory species that cross national boundaries**. The Convention covers a wide range of species, including birds, mammals, fish, and reptiles, and seeks to address threats to these species, including habitat destruction, hunting, and climate change.
- The CMS has **been ratified by over 130 countries**, making it one of the most widely recognized international agreements for the conservation of wildlife.
- The Convention **meets every three years** to discuss new developments and progress on conservation efforts, and to make decisions on how to move forward with the conservation of migratory species.
- **Species Covered:** Convention has two Appendices
 - **Appendix I** lists migratory species that are **endangered or threatened with extinction**.
 - **Appendix II** lists migratory species which **have an unfavourable conservation status and which require international agreements for their conservation** and management.

65. GM Poplars and Climate Change

Section: Climate Change

Context: A forest of GM Poplars to beat climate change

More on the News:

- In a low-lying tract in the pine belt of southern Georgia in the US, an experiment is underway to use, for the first time, **genetically modified (GM) poplar seedlings that will grow** wood at turbocharged rates while slurping up carbon dioxide from the air.
- These poplars may be the **first GM trees planted in the US outside of a research trial or a commercial fruit orchard**.
- Just as the introduction of the "Flavr Savr tomato in 1994 introduced a new industry of GM food crops, the planters of the poplars hope to transform forestry.
- Living Carbon, a San Francisco-based biotechnology company that produced the poplars, intends for its **trees to be a large-scale solution to climate change**. The four-year-old company has attracted an investment of 536 million.
- Living Carbon has yet to publish peer-reviewed papers; its only publicly reported results come from a greenhouse trial that lasted just a few months. These data have some experts intrigued, but stopping well short of a full endorsement.

- Biologists in Living Carbon's lab tinkered with how trees conduct photosynthesis. While photosynthesis has profound impacts on the Earth, as a chemical process it is far from perfect. Numerous inefficiencies prevent plants from capturing and storing more than a small fraction of the solar energy that falls onto their leaves
- Those **inefficiencies, among other factors, limit how fast trees and other plants grow, and how much carbon dioxide they soak up**. Scientists have spent chromosomes decades trying to take over where evolution left off.
- Living Carbon's research has been inspired by the work of University of Illinois geneticist Donald Ort, who announced in 2019 that he and his colleagues had genetically hacked tobacco plants to photosynthesize more efficiently. The **researchers added genes from pumpkins and green algae to induce tobacco seedlings to recycle toxins** produced as a photosynthesis byproduct into more sugars, producing plants that grew nearly
- 40% larger Living Carbon grew engineered poplars in pots, and reported in a non- peer reviewed paper last year that its tweaked poplars grew more than **50% faster than non-modified ones** over five months in greenhouse
- The company's researchers created the greenhouse-tested trees using a bacterium that splices foreign DNA into an- other organism's genome. But for the trees they planted in Georgia, they turned to an older and cruder technique known as the gene gun method, which essentially blasts foreign genes into the trees.

67. Can we use moon dust to slow down global warming?

Concept:

- It is said that a summer less year followed the volcanic eruption of Mt. Tambora in 1816 which released sulphates and other aerosols into the stratosphere that cooled the atmosphere.
- This has encouraged people to examine the possibility of using similar methods artificially to slow down global warming.

Moon dust coolers

- In a recent paper published in the PLoS Climate journal, researchers from the U.S. have proposed the idea of **launching tonnes of dust from the moon to a point in space** where the gravitational forces of the earth and the Sun cancel each other out.
- Launching the dust to such a point will ensure that the dust will be stationed there which helps cast a shadow on earth and reduce sunlight to offset carbon emissions.
- **Aerosols in the stratosphere**, particularly those **which are radiation-scattering** such as **sulphates, have a cooling effect**.
- It is to be noted that the summer less year which followed the 1816 eruption significantly **affected crop yields worldwide causing disease and starvation**.
- Additionally, various climate models also have confirmed that dimming the amount of incoming sunlight with stratospheric aerosols will have similar implications on crop yield.
- A few studies however have argued that such droughts would not be as harmful and that the GDPs of the countries will be positively affected by such **solar radiation management (SRM)**.

Solar radiation management (SRM)

- **Solar radiation management (SRM) is a type of climate engineering that aims to reduce or slow down global warming by reflecting sunlight.**
- The proposed methods of SRM include increasing the planetary albedo by:
- Placing reflective balloons, sunshades, or mirrors in space.
- Injecting heat-deflecting aerosols directly into Earth's stratosphere to bounce more of the Sun's heat back into space.
- Marine Cloud Brightening involves introducing saltwater particles from the ocean up into the cloud layer to increase the reflectivity of clouds.
- Adopting surface-based approaches like whitening roofs, growing more reflective crops, etc.
- Adopting restorative methods such as protecting natural heat reflectors like sea ice, snow and glaciers with engineering projects.
- SRM is said to be a **fast and inexpensive approach** to slowing down global warming.

Concerns

- There is **still uncertainty about the potential changes in rainfall patterns** as a result of blocking sunlight which can have **unintended consequences in the form of drought and crop losses**.
- These methods are best when **adopted at the continental scale and not at the regional scale**. Thus these measures cannot offset the adverse effects of heat waves and droughts regionally.
- Various natural and social scientists have raised concerns about SRM techniques and governance.
- There are also **concerns regarding the aerosol-loading approach** that there will be a rebound effect once spraying stops and the aerosols are washed out of the atmosphere.

68. Centre may notify emission trading scheme by June

Section: Climate Change

Concept :

- After the passing of the Energy Conservation (Amendment) Bill last December, the **Centre is now in the final stages of notifying an Emissions Trading Scheme (ETS)** that would require polluting industries to achieve certain standards of energy efficiency and permit them to ‘trade’ these improvements.

What is Emissions Trading?

- Emissions Trading is one of the **so-called Kyoto Mechanisms** under the **United Nations Framework Convention on Climate Change (UNFCCC)**.
- Emissions trading is a **market-based method of pollution control** by offering financial incentives for lowering pollutant emissions.
- As a crucial instrument for mitigating climate change, carbon emission trading for CO₂ and other greenhouse gases has been implemented in China, the European Union, and other nations.
- In an emissions trading scheme, a central authority or governmental organization allots or sells a finite number of permits that authorize the release of a particular quantity of a particular pollutant over a finite time period.
- Polluters must possess licenses for a quantity equivalent to their emissions.
- If polluters wish to expand their emissions, they must purchase licenses from people who are prepared to do so.

Cap on emission and Tradable allowance

- The two **main elements of emissions trading systems** are a **limit (or cap) on pollution** and **tradable allowances** that are equivalent to the limit and allow holders of the allowances to emit a certain amount of the pollutant.
- This **cap makes sure the environmental objective is achieved**, and the **tradable allowances provide each emissions source the freedom to choose their own course for compliance**.
- These initiatives are frequently **referred to as “market-based”** because permits can be purchased and sold on an allowance market.

69. TN, Kerala and Karnataka to carry out first synchronised vulture survey

Section: Species in News

Concept :

- The Forest and Wildlife Departments of Kerala, Tamil Nadu and Karnataka are preparing to organise the first synchronised vulture survey in various regions of the Western Ghats.
- Every year the Forest Departments of the three States organise separate surveys but in a **tripartite coordination meeting held in Mudumalai Tiger reserve**, the departments have **decided to organise the first synchronised vulture survey in the Western Ghats to avoid duplications**.
- The **Wayanad Wildlife Sanctuary**, contiguous to the Nagarhole and Bandipur Tiger reserves of Karnataka and Mudumalai tiger reserve of Tamil Nadu, **is the only region where vultures thrive in Kerala**.
- The Wayanad Wildlife Sanctuary houses close to 120-150 **white-rumped vultures** and about 25 **red-headed vultures** with the occasional sightings of **long-billed vultures** also being reported.
- Vultures are witnessing a **catastrophic decline during the 2000s** as these species are being exposed to **diclofenac drug** which is mainly used as a painkiller for cattle.

Indian Vulture (*Gyps indicus*)

- **Critically Endangered [IUCN]**
- **Long-billed Vulture, The Indian Vulture**, which is closely related to the European Griffon, is typically found in **woods, grasslands, and shrub lands**.
- It is seen close to human-occupied regions like cities, towns, and agricultural areas, just like many other vulture species. This vulture can be found all over the Indian subcontinent and its neighboring nations, as its name suggests.

Red-headed Vulture (*Sarcogyps calvus*)

- **Critically Endangered [IUCN]**
- **Other names:** Pondicherry Vulture, Indian Black Vulture, Asian King Vulture
- Red-headed Vultures are found all over India, though in small numbers with the exception of the western Himalayas. These vultures favor vast spaces, semi-deserts, and scrublands that are far from populated areas.
- They are distinct, medium-sized raptors with dark plumage, red legs, and red necks.
- They typically **appear alone or in pairs rather than in vast groups**, in contrast to many other vultures. They construct nests in large trees.

White-Rumped Vulture (*Gyps bengalensis*)

- **Critically Endangered [IUCN]**
- Known as: Indian White-backed Vulture, White-backed Vultures.
- White-rumped Vultures, a medium-sized vulture, are frequently spotted close to areas where people are present. They have black and brown plumage with white neck ruffs.

- They frequently appear in groups with different vulture species. White-rumped Vultures consume carrion, like the majority of vultures.
- However, they have also been seen eating trash and abattoir waste as they dwell close to populated areas. They erect nests atop cliffs and trees.

70. What is whale stranding and why does it happen?

Subject: Environment

Section: Species in news

In the news:

- Earlier in February, 14 pilot whales were stranded near the shore of **Kalpitiya**, a town located on Sri Lanka's west coast.

Details:

- In **2020**, the country witnessed one of the biggest whale strandings in recent history when more than 100 pilot whales beached on the western coast of **Panadura**.
- Apart from **Sri Lanka**, **Australia's Tasmania** has also seen mass beaching of whales. Last year in September, more than **230 pilot whales** were stranded on the west coast of the region.

Whale stranding:

- Whale stranding is a phenomenon in which **whales are stuck on land, usually on a beach**.
- Other aquatic animals like **dolphins** and **porpoises** are also known to beach.
- Most of the stranding events involve single animals but sometimes, mass strandings, consisting of hundreds of marine animals at a time, can happen.
 - This is not a new phenomenon and have been occurring since the times of Aristotle
- **Reason:** No clear reason has been established yet. The **reasons for mass strandings** are several including:
 - the topography of the region,
 - Illness,
 - Rising temperature in the ocean
 - Human activities and
 - Increasing noise pollution in the oceans.
- **Hotspot regions:** Tasmania, New Zealand's Golden Bay and Massachusetts's Cape Cod in the United States.
- Currently there is no **'One-size-fit-all' approach** to prevent these mass stranding.

71. Etalin hydel project

Section: Indian Physical Geography

Context: Denial of clearance to Etalin hydel project offers relief to some; may impact Arunachal's hydropower development plan.

More in news:

- The **Forest Advisory Committee (FAC)** did not limit its discussion to the Etalin project alone and involved other projects being executed and planned in the entire Dibang Valley.

Hydro projects in Arunachal Pradesh:

- Overall, 18 hydel projects with a cumulative capacity of 9,973 MW have been planned in the Dibang river valley, covered by the administrative districts of Dibang Valley and Lower Dibang Valley.
- **Etalin Hydel Project:**
 - **3,097-megawatt Etalin Hydroelectric Project (EHEP)** — was proposed to be developed as a **joint venture** between Jindal Power Ltd and the Hydropower Development Corporation of Arunachal Pradesh Ltd.
 - The plan combined **two run-of-the-river schemes** with limited storage requiring concrete gravity dams on **rivers Tangon** and
 - The **Etalin project** is planned to be built about a **100-kilometre north** of another mega project, the **2,880 MW Dibang multipurpose project (DMP)**.
 - The latter got **Stage-II forest clearance in 2020**, but work is yet to begin, as approval from the Public Investment Board is still pending.
 - It ran into several controversies since its inception in 2008 over concerns of ecological damage, forest invasion and tribal displacement.

Dir and Tangon River:

- The **Dir and Tangon river**, both **tributaries of the Dibang River** (tributary of Brahmaputra) in **Arunachal Pradesh, India**, have the following significance:
 - **Hydrological:** Both rivers contribute to the overall hydrology of the region by providing water for irrigation and hydropower generation.

- **Ecological:** The Dir and Tangon rivers support a diverse array of plant and animal life, including rare and endangered species.
- **Tourist Attraction:** The scenic beauty of the Dir and Tangon rivers, along with the Dibang, is a major tourist destination.

Forest Advisory Committee

- It is a **statutory body** which was constituted by the **Forest (Conservation) Act 1980**.
- It comes under the **Ministry of Environment, Forests & Climate Change (MoEF&CC)**.
- It considers questions on the diversion of forest land for non-forest uses such as mining, industrial projects, townships and advises the government on the issue of granting forest clearances. However, **its role is advisory**.

72. Launch of the 'Mangrove Breakthrough'

Section : International convention

What is Mangrove Breakthrough?

- The **Mangrove Breakthrough** is part of a set of **Marrakech Partnership Adaptation and Resilience Breakthroughs** which collectively define global milestones and high-impact solutions to reduce climate risks, particularly in vulnerable communities, through adaptation action.
- It **aims to catalyze the financial support** needed to scale proven solutions by working to channel finance to the ground through the **Global Mangrove Alliance (GMA)**.
 - GMA is a world-wide collaboration between NGOs, governments, academics and communities working together towards a global vision for accelerating change and building a host of opportunities for coastal peoples and biodiversity around the planet.
- Agenda: Building on the **Breakthrough Agenda launched at COP26**, and the work of the **Global Mangrove Alliance**, the **Mangrove Breakthrough** provides a framework for countries, the private sector, and others to join forces and strengthen their actions every year, in every sector, through a **coalition of leading public, private and public-private global initiatives** scaling up investment in **mangrove protection and restoration**.

About The Global Mangrove Alliance:

- Launched In **2018**
- Launched jointly by the **Conservation International (CI), the International Union for Conservation of Nature (IUCN), The Nature Conservancy (TNC), Wetlands International, and World Wildlife Fund (WWF)**.
- This partnership now **includes over 30 member organizations** that share the **aim** of scaling up the recovery of mangroves through equitable and effective expansion of both mangrove protection and the restoration of former mangrove areas.
- The GMA works worldwide in supporting research, advocacy, education and practical projects on the ground with local and community partners.

73. UN High Seas Treaty

Section: International convention

In the news:

- A new round of negotiations on the **United Nations High Seas Treaty for conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ)** began in New York February 20, 2023.

Definition of High seas:

- The **high seas** are **areas beyond the 200 nautical mile limit of the exclusive economic zones of coastal states**.
- **Why is it important?**
 - Home to around **270,000 species**, the **high seas cover more than two-thirds of the global ocean**.
 - Over **1,550 marine animals and plants** face a risk of extinction, with climate change impacting at least 41 per cent of threatened marine species, the **International Union for Conservation of Nature Only 1.44 per cent of the high seas are protected**.

What is the BBNJ Treaty?

- The “BBNJ Treaty”, **also known as the “Treaty of the High Seas”**, is an international agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, **currently under negotiation at the United Nations**.
- The treaty will be **legally binding** in nature.
- This new instrument is **being developed within the framework of the UNCLOS**, the main international agreement governing human activities at sea.
- It will achieve a **more holistic management of high seas activities**, which should better balance the conservation and sustainable use of marine resources.
- BBNJ **encompasses the high seas, beyond the exclusive economic zones or national waters of countries**.

- According to the **International Union for Conservation of Nature (IUCN)**, these areas account for “**almost half of the Earth’s surface**”.
- These areas are **hardly regulated and also least understood or explored** for its biodiversity – only 1% of these areas are under protection.
- **An important element under the treaty:** The **benefit sharing of marine genetic resources (MGRs)**.
 - It includes marine plants, animals and microbes from areas beyond national jurisdiction.
 - The **element aims** to address the inequalities in sharing benefits from samples, basic and applied research results as well as monetary benefit sharing from MGRs.
- Launched at the **One Ocean Summit** in February 2022, the **High Ambition Coalition on Biodiversity Beyond National Jurisdiction** brings together many delegations engaged in the BBNJ negotiations on a common and ambitious outcome at the highest political level.
- The negotiations are **centred around a package of elements** agreed upon in 2015, namely:
 - the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, in particular, together and as a whole, marine genetic resources, including questions on the sharing of benefits
 - area-based management tools, including marine protected areas
 - environmental impact assessments
 - capacity-building and the transfer of marine technology

74. Nord Stream spill is biggest methane leak ever, but minuscule compared to global release of the greenhouse gas: UNEP

Section : Climate Change

Context: A massive plume of highly concentrated methane was released into the atmosphere after the incident in September 2022.

Report findings:

- A **UNEP-led assessment** found that the rupture of the **Nord Stream natural gas pipeline** under the **Baltic Sea** is the **biggest single event** that led to the massive release of climate-damaging methane. But the incident is a “drop in the ocean compared to the amount of methane released globally”.
- The amount of methane released during the incident represents less than 0.1 per cent of the total annual human-made methane emissions.
- It also equals the methane emissions the oil and gas industry generates in a single day.
- **International Methane emission observatory (IMEO)** is creating a worldwide public database of methane emissions with unparalleled precision and granularity to spur action to reduce methane emissions.

Methane emission:

- In October 2023, scientists had identified more than 50 ‘super-emitters’ of heat-trapping methane gas in central Asia, west Asia and the southwestern United States.
- Most of these sites have ties with agriculture and fossil fuel industries.
- **Methane** accounts for a small portion of human-induced greenhouse gas emissions compared to carbon dioxide. But it is thought to be **80 times more efficient than carbon dioxide at trapping atmospheric heat** in the 20 years following its release.
- **Methane stays in the atmosphere for only ten years**, unlike CO₂, which persists for hundreds or thousands of years.
- This indicates that a significant decrease in methane emissions might sharply reduce anticipated global warming by the middle of the century.

International Methane Emissions Observatory (IMEO)

- **Launched by:** UN Environment Programme (UNEP) with support from the European Union
- **Launched at** the recent **G20 Summit**.
- **Objective of the IMEO**
 - The observatory aims to provide credible data to track the country’s progress on meeting methane reduction pledges and to promote best practices.
 - It will initially focus on methane emissions from the fossil fuel sector and then expand to other major emitting sectors like agriculture and waste.
 - It will also monitor commitments made by countries in the Global Methane Pledge, a US- and EU-led effort to slash methane emissions by 30% by 2030.

75. Access and benefit-sharing: Paper proposes 8 principles on use of indigenous medicine

Section: Biodiversity

Context:

- A group of practitioners, activists, scholars, lawyers and human rights defenders has proposed a **set of ethical guidelines** that can **guide Western psychedelic research and practice on traditional indigenous medicines**.

Details:

- The **set of eight ethical principles** — each beginning with the letter ‘R’ — can address increasing concerns among many indigenous nations regarding the **cultural appropriation of their traditional medicines**.
- The proposed guidelines come as the use of **psychedelics for therapeutic purposes** is on the rise.

The 8 Rs:

- Reverence, Respect, Responsibility, Relevance, Regulation, Reparation, Restoration, and Reconciliation.
- **These were categorised within four overarching categories:**
 1. Acknowledgement
 2. Knowledge-Translation and Education
 3. Intellectual Property
 4. Belonging

What are Psychedelics substances?

- **Psychedelics** (serotonergic hallucinogens) are powerful psychoactive substances that alter perception and mood and affect numerous cognitive processes.
- They are generally considered physiologically safe and do not lead to dependence or addiction.
- There were **367 registered clinical studies on psychedelics as of 2022**.
- An increasing number of cities and states in the US have also **legalised their use**.
- Indigenous healing medicines like Ayahuasca are rising in popularity. Yet, the economic profits hardly accrue to the communities and regions from where these medicines originate.

Need for the guidelines:

- The economic profits alone of the psychedelic industry is expected to grow to 6.85 billion by 2027.
- Traditional Indigenous medicine was not widely protected by law.
- As of **2022**, only the constitutions of **Bolivia (Art. 42)** and **Ecuador (Art. 57)** include regulation specific to **Indigenous traditional medicine**.
- While Western psychedelic practitioners and facilitators can reach average earnings of \$10,500 per service event, indigenous medicine practitioners may earn between \$2 to \$150 for their services in their communities of origin.
- International demand is driving people to **unsustainably harvest iboga**, the plants used to make **ayahuasca** and the **hallucinogenic cactus peyote**.

Is there any global framework?

- Yes. There are frameworks that mention **indigenous rights to the use and development of their traditional medicines and related practices**.
- These include the **Article 8 (j)**, **Article 16** and **Annex 1** of the **Convention on Biological Diversity (CBD)** as well as the **Articles 7** and **12** of the **CBD’s Nagoya protocol on Access and benefit-sharing (ABS)**.
- However, countries like the US where research on psychedelics using traditional indigenous medicine is being carried out, **are not signatories to the CBD and therefore also not party to the Nagoya protocol on ABS**.

What is access and benefit-sharing?

- **Access and benefit-sharing (ABS)** refers to the way in which genetic resources may be accessed, and how the benefits that result from their use are shared between the people or countries using the resources (users) and the people or countries that provide them (providers).

Why is it important?

- The **access and benefit-sharing provisions** of the **Convention on Biological Diversity (CBD)** are designed to ensure that the **physical access to genetic resources is facilitated** and that the benefits obtained from their use are shared equitably with the providers.
- In some cases this also includes **valuable traditional knowledge** associated with genetic resources that comes from **indigenous and local communities (ILCs)**.
- The benefits to be shared can be **monetary**, such as **sharing royalties** when the resources are used to create a commercial product, or **non-monetary**, such as the development of research skills and knowledge.
- It is vital that both users and providers understand and respect institutional frameworks such as those outlined by the **CBD** and in the **Bonn Guidelines**.
- These help governments to establish their own national frameworks which ensure that access and benefit-sharing happens in a fair and equitable way.

How does it work?

- **Access and benefit-sharing** is based on **prior informed consent (PIC)** being granted by a provider to a user and negotiations between both parties to develop **mutually agreed terms (MAT)** to ensure the fair and equitable sharing of genetic resources and associated benefits.

- **Prior informed consent (PIC):** is the permission given by the competent national authority of a provider country to a user prior to accessing genetic resources, in line with an appropriate national legal and institutional framework.
- **Mutually agreed terms (MAT):** is an agreement reached between the providers of genetic resources and users on the conditions of access and use of the resources, and the benefits to be shared between both parties.
- These conditions are required under **Article 15** of the **CBD**, which was adopted in **1992** and provides a global set of principles for access to genetic resources, as well as the fair and equitable distribution of the benefits that result from their use.

Who is involved?

- **Providers of genetic resources:** States have sovereign rights over natural resources under their jurisdiction. They are obligated to put in place conditions that facilitate access to these resources for environmentally sound uses. Providers agree terms, which include **PIC** and **MAT**, for granting access and sharing benefits equitably. Laws within the provider country may entitle others, such as **indigenous and local communities (ILCs)**, to also negotiate terms of access and benefit-sharing. The participation of ILCs is necessary in instances where traditional knowledge associated with genetic resources is being accessed.
- **Users of genetic resources:** Users are responsible for sharing the benefits derived from genetic resources with the providers. They seek access to genetic resources for a wide range of purposes, from basic research to the development of new products. They are a diverse group, including botanical gardens, industry researchers such as pharmaceutical, agriculture and cosmetic industries, collectors and research institutes.
- **National Focal Points:** To facilitate access, users need a clear and transparent process that details who to contact and what the requirements and processes are in provider countries in order to gain access. **National Focal Points are responsible for providing this information.**
- **Competent National Authorities (CNAs):** CNAs are bodies established by governments and are responsible for granting access to users of their genetic resources, and representing providers on a local or national level. National implementation measures establish how CNAs work in a given country.

76. Blue foods can help India improve nutrition, livelihood: Study

Section: Climate change

Context:

- **Blue food**, sourced from **aquatic environments**, can reduce nutritional deficiencies and contribute to employment and export revenue in India, according to a new study.

Details:

- Compared to terrestrial meat, **blue foods generate lower emissions.**
- They can also **contribute to the health, well-being and livelihoods of rural communities.**
- India can use aquatic foods to address **B12** and **omega-3** deficiencies.

What is Blue Food?

- They are food derived from aquatic or marine animals, plants or algae that are caught or cultivated in freshwater and marine environments.
- **Examples**
 - Seaweeds, Sea Cucumber
 - Bivalves (mussels, oysters, etc.)
 - Fishes like tilapia, salmon, catfish and carp, etc.
 - It also involves **Capture Fisheries.**
- Capture fisheries refers to all kinds of harvesting of naturally occurring living resources in both marine and freshwater environments.

Advantages:

- They have higher nutritional benefits in comparison to terrestrial food.
 - Many blue food species are rich in important nutrients like omega-3 fatty acids, vitamins and minerals.
- More sustainable as they release less greenhouse gasses.
- The aquaculture and marine farms free the space which was needed for feeding the growing population by conventional agriculture.
- They can address the problem of **'real hunger'** and the **'hidden hunger'** both. They helps in fulfilling the **SDGs (SDG2 Nutrition and SDG14 Sustainable use of marine resources).**

Blue food vs Red meat:

- Countries with high red meat intake, above the threshold recommended as environmentally sustainable and healthy, have an **increased incidence of cardiovascular disease.**

- India's consumption of red meat was around 50 grams per capita per day, which is not high, moreover, the country does not suffer from high levels of cardiovascular disease.
- **Promoting blue foods over red meat** overconsumption could address health and environmental concerns for about **82 per cent** of the **22 countries** suffering from a high cardiovascular disease risk.
- **Over 91 per cent** of countries with **vitamin B12 deficiencies** also show **high levels of omega-3 deficiency**.

Issue in blue food production:

- Almost **90 per cent of global marine fish stocks** are now **fully exploited or overfished**, according to the **World Bank**.
 - There are issues with overfishing, illegal fishing and other unsustainable aquatic food production.
- Danger of invasive species.
- Technology and capital intensive sector.

Schemes and policies related to blue economy:

Draft Blue Economy Policy:

- The **Ministry of Earth Sciences (MoES)** has rolled out the **draft Blue Economy policy**, inviting suggestions and inputs from various stakeholders.
 - It is in line with the Government of India's Vision of New India by 2030.
- **Key Highlights of the Policy**
 - It categorised the blue economy as one of the 10 core dimensions for national growth.
 - It emphasizes policies across several key sectors to achieve holistic growth of India's economy.
 - It recognizes the following **7 thematic areas**:
 - National accounting framework for the blue economy and ocean governance.
 - Coastal marine spatial planning and tourism.
 - Marine fisheries, aquaculture, and fish processing.
 - Manufacturing, emerging industries, trade, technology, services, and skill development.
 - Logistics, infrastructure and shipping, including trans-shipments.
 - Coastal and deep-sea mining and offshore energy.
 - Security, strategic dimensions, and international engagement.

Pradhan Mantri Matsya Sampada Yojana:

- Nodal Ministry/ Department: **Department of Fisheries**
- **Tenure:** 2020-2025
- Intended Beneficiaries are
 - Fishermen, fish farmers, fish workers and fish vendors
 - Fisheries Development corporations
 - Self Help Groups (SHGs)/Joint Liability Groups (JLGs) in the fisheries sector
 - Fisheries cooperatives and federations
 - Entrepreneurs and private firms
 - Fish Farmers Producer Organisations/Companies (FFPOs/Cs)
 - SCs/STs/Women/Differently abled persons

77. Kerala to estimate wild elephant and tiger populations

Section: Species in news

Context: The Kerala Forest department is set to launch surveys to enumerate wild elephant and tiger populations as part of its efforts to mitigate man-animal conflict in the State.

Tiger census

- The national tiger census is conducted **once every four years**.
- The Nation-wide tiger census was earlier held in 2006, 2010, 2014, 2018.
- The **National Tiger Conservation Authority (NTCA)** conducts tiger censuses in partnership with state forest departments, conservation NGOs, and the Wildlife Institute of India (WII).
- **Census methodology**
 - **Double sampling based on ground-based surveys and actual images** captured on camera-traps.
 - Double sampling method was **introduced in 2006 after the "pugmark" surveys** were found to be inaccurate.
 - In 2018 census, 83% of the big cats censused were individually photographed using camera traps.
 - In **Phases 1 & 2, ground-based surveys** were carried out by Forest Department officials to collect signs of tiger presence like scat and pugmarks.
 - In **phase 3**, the information was plotted on the forest map prepared with remote-sensing and GIS (**MSTrIPES**).
 - In the last phase, data were extrapolated to areas where cameras could not be deployed.

Elephant census

- Elephant numbers largely **rely on States directly counting** the number of elephants.
- Elephants are **counted once in five years**.
- **Census methodology**
 - The direct elephant counting method is based on sightings of elephants.
 - In the indirect method, surveyors follow a dung decay formula for arriving at population estimation which is being used by Tamil Nadu and Karnataka at present.
 - A variation of about 8% to 9% has been noticed between the two methods.

78. Hummingbirds

Section: Species in news

Hummingbirds:

- Hummingbirds are **small, brightly colored birds** known for their rapid wing beats and ability to hover in mid-air.
- They are **found in the Americas**, from Alaska to Tierra del Fuego, and are a popular subject for birdwatchers and photographers.
- There are over 300 species of hummingbirds, with a wide range of sizes and colors. The **smallest hummingbird species, the bee hummingbird**, is only about 2.25 inches (5.7 cm) long, while the **largest species, the giant hummingbird**, can grow up to 8.5 inches (21.6 cm) long.
- Hummingbirds are known for **their unique flying abilities**. Their wings can **beat up to 80 times per second**, allowing them to hover in place, fly backwards, and change direction quickly.
- They are also **capable of flying long distances**, with some species migrating thousands of miles each year.
- The **energy demands of hovering are very high**. Relative to their body mass, hummingbirds have the **highest metabolic rate** among vertebrates.
- Hummingbirds **feed primarily on nectar from flowers**, which provides them with the energy they need to sustain their high metabolism. They also **eat small insects and spiders** for protein.
- Hummingbird species live year-round in **tropical mountain habitats** at high altitudes, such as in the Andes over ranges of 1,500 metres to 5,200 metres where the **partial pressure of oxygen in the air is reduced**, a **condition of hypoxic** challenge for the high metabolic demands of hummingbirds.
- In Andean hummingbirds living at high elevations, researchers found that the **oxygen-carrying protein in blood hemoglobin had increased oxygen-binding affinity**, and that **this adaptive effect likely resulted from evolutionary mutations** within the hemoglobin molecule via specific amino acid **changes due to natural selection**.

79. 30 tigers die in 2 months; officials say no cause for alarm

Section: Species in news

Context: Nearly two months into 2023, India has already recorded 30 tiger deaths. The number, however, is not a cause for alarm, according to officials at National Tiger Conservation Authority (NTCA), as tiger deaths usually spike between January and March.

More on the News:

- Tiger deaths have so far been reported from **Kanha, Panna, Ranthambore, Pench, Corbett, Satpura, Orang, Kaziranga and Sathyamangalam reserves**. Of the 30 deaths, 16 have been reported outside the reserves.
- The reason why tiger deaths are higher in these two states (MP and Maharashtra) is **because they have a healthy tiger population**.
- With an increase in tiger population, **there will naturally be an increase in the number of deaths**.
- From NTCA's data the **highest number of tiger deaths takes place between January and March** in any given year. This is the time that **they leave their territories and venture out, so there is conflict between tiger**. There are territorial conflicts among the tigers as well. With a healthy tiger population in the country, 200 Tiger deaths annually is not untoward.
- The issue is not of tigers dying, they will die like any other animal. But increase in **poaching is a matter of concern**. The tiger death (this year) in Sathyamangalam reserve is, a case of poaching by the Bawariya poachers.

Status of Tiger Report:

- Tigers were observed to **be increasing at a rate of 6 per cent per annum** in India from 2006 to 2018.
- There were nine tiger reserves when Project Tiger started in 1973. Now, India has 53 tiger reserves. **Seventy per cent of the world's tigers are in India** and the conservation effort has been a huge success.
- While tiger populations remain stable in the country, the report warns that with the populations being confined to small Protected Areas, some of which have habitat corridors that permit tiger movement between them, "most of the corridor habitats in India are not protected areas, and are degrading due to unsustainable human use and developmental projects".
- Tiger occupancy has **increased in Madhya Pradesh and Andhra Pradesh**. The former also registered a substantial increase in tiger population, and along with Karnataka, ranks highest in tiger numbers.
- The Northeast has, meanwhile, suffered losses in population.
- The population in Jharkhand, Chhattisgarh and Odisha too have seen a decline in the number of tigers

- The **largest contiguous tiger population in the world of about 724 tigers** was found in the Western Ghats (Nagarhole-Bandipur-Wayanad-Mudumalai- Satyamangalam-BRT block).

Tiger :

Royal Bengal Tiger-

- The **Bengal tiger** is a population of the **Panthera tigris** Tigris subspecies. It ranks among the **biggest wild cats alive today**. It is considered to belong to the world's charismatic megafauna.
- The tiger is estimated to have been present in the **Indian subcontinent** since the **Late Pleistocene**, for about 12,000 to 16,500 years.
- Today, it is threatened by **poaching, loss and fragmentation of habitat**.
- The **Bengal tiger's historical range** covered the **Indus River valley** until the **early 19th century**, almost all of **India, Pakistan, southern Nepal, Bangladesh, Bhutan** and **southwestern China**.
- Today, it inhabits **India, Bangladesh, Nepal, Bhutan** and **southwestern China**.

Characteristics-

- The **Bengal tiger's** coat is yellow to light orange, with stripes ranging from dark brown to black; the belly and the interior parts of the limbs are white, and the tail is orange with black rings.
- The white tiger is a **recessive mutant**, which is reported in the wild from time to time in **Assam, Bengal, Bihar**, and especially in the **former State of Rewa**.

Where are they found in India?

- Good tiger habitats in **subtropical and temperate forests** include the Tiger Conservation Units (TCUs) **Manas-Namdapha**.
- **Tropical dry forests** include **Hazaribag Wildlife Sanctuary, Nagarjunsagar-Srisailem Tiger Reserve, Kanha-Indravati corridor, Orissa dry forests, Panna National Park, Melghat Tiger Reserve and Ratapani Tiger Reserve**.
- **Tropical moist deciduous forests** are probably some of the **most productive habitats** for tigers and their prey and include **Kaziranga-Meghalaya, Kanha-Pench, Simlipal and Indravati Tiger Reserves**.
- **Tropical moist evergreen forests** represent the **less common tiger habitats**, being largely limited to the upland areas and wetter parts of the **Western Ghats**, and include the tiger reserves of **Periyar, Kalakad-Mundathurai, Bandipur and Parambikulam Wildlife Sanctuary**.

Conservation effort-

- **IUCN status**– Endangered

Estimation of Tiger Populations

- 'Tiger census' is conducted **every four years** to know the current tiger populations and population trends.
- The **most commonly used technique** in the past was the **'Pugmark Census Technique'**.
- Recent methods used to estimate the numbers of tigers are **camera trapping and DNA fingerprinting**.
- **M-STripES** (Monitoring System for Tigers – Intensive Protection and Ecological Status) is an **app-based monitoring system**, launched across Indian tiger reserves by the **NTCA in 2010**.
- **LIDAR-based survey technology** will be used for the first time to provide water and fodder to animals in the forest itself to deal with the challenge of human-animal conflict which is causing the deaths of animals.

80. Sloth bears

Section :Species in news

Context: A new study has found that maintaining forest cover and preventing fragmentation of habitats while minimising human disturbance is crucial for long-term conservation of bears outside protected wildlife reserves across India.

More on the News:

- Scientists from Bengaluru-based Centre for Wildlife Studies, the National Centre for Biological Sciences (NCBS)-Tata Institute of Fundamental Research (TIFR), and the University of Florida **studied sloth bears in a forest corridor of Madhya Pradesh.**
- They have published their findings in their latest scientific paper titled ‘Safe space in the woods: Mechanistic spatial models **for predicting risks of human–bear conflicts in India**’ in the journal Biotropica.
- In the recent study, researchers **conducted indirect sign surveys** (documenting pugmarks and faeces) to understand where sloth bears are found and why. They combined these results with information on bear attacks on people, gathered through interview surveys of local communities.
- Bear attacks on people were more **likely to happen in areas with denser forests, rough terrains and locations with high bear presence.**

Sloth Bears:

- It is a **Myrmecophagous** bear species.
- Distribution:
 - They are **endemic to the Indian sub-continent** and 90% of the species population is found in India with small populations in Nepal and Srilanka.
 - It occurs in a wide range of habitats including **moist and dry tropical forests, savannahs, scrublands and grasslands** below 1,500 m (4,900 ft) on the Indian subcontinent, and below 300 m (980 ft) in Sri Lanka’s dry forests. It is **regionally extinct in Bangladesh.**
 - Sloth bears are found in all parts of the country **except Jammu and Kashmir and northeastern States.**
- **Characteristics:**
 - They are **nocturnal animals.**
 - It feeds on fruits, ants and termites.
 - Sloth bears **do not hibernate.**
- **Protection Status**
 - IUCN red list: listed as ‘**vulnerable**’
 - Wildlife Protection Act of India, 1972: **listed under Schedule I**
- **Threats:**
 - **Animal-Human conflict:** Over the past few years there has been a rise of incidents of human sloth bear conflict in States like Gujarat, Rajasthan and Maharashtra among other states.
 - Exploitation: Sometimes captured **and kept as pets**, which can lead to their exploitation and mistreatment.

81. Plastic waste in urban drains can lead to an explosion of mosquitoes

Section: Pollution

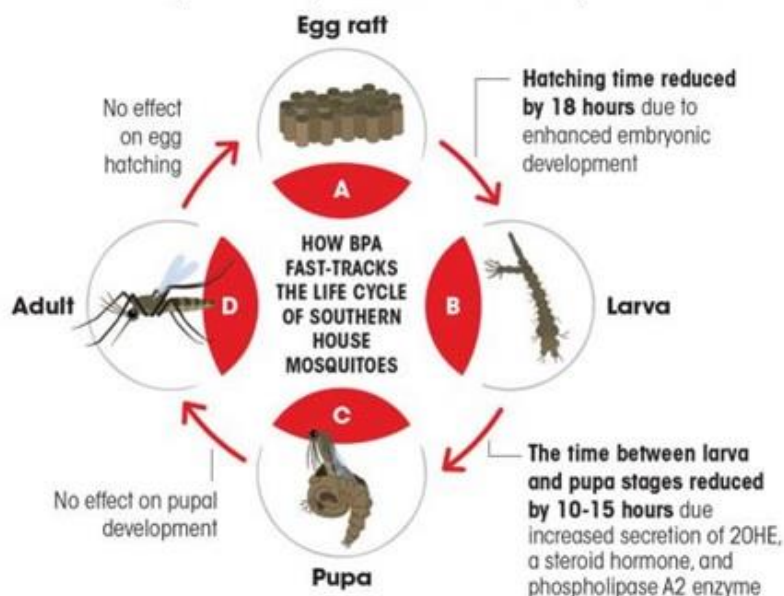
Context: A study conducted in Thiruvananthapuram, Kerala, suggests bisphenol A, or BPA can indirectly aid in the spread of vector-borne diseases in humans and animals.

More on the Findings:

- Study establishes that the human-made chemical can significantly **shorten the breeding time of southern house mosquitoes** (*Culex quinquefasciatus*), a major carrier of the West Nile virus, Rift Valley fever virus and avian pox in tropical and subtropical countries, and thereby aid in its quick multiplication.
- This is a matter of concern as most urban wastewater canals, which serve as breeding sites for mosquitoes, are choked with BPA-laden plastic waste.
- Southern house mosquitoes, in contrast, **thrive in the presence of the compound.** The **larvae of the mosquito can tolerate BPA without causing lethal effects up to a concentration of 5 mg/L**, a level much higher than what is normally found in the environment.

Plastics quicken mosquito life cycle

A bisphenol A (BPA) concentration of 1 mg/L in wastewater can shorten the life cycle of mosquitoes from 13 to 10 days



Source: Based on "Bisphenol A acts as developmental agonist in *Culex quinquefasciatus* Say" published in *Environmental Science and Pollution Research* on May 31

- The study findings are expected to have far-reaching consequences as BPA is manufactured in high quantities globally and its industrial discharge is a known surface freshwater contaminant.

BisphenolA (BPA)

- BisphenolA (BPA) is a chemical compound and one of the simplest and best-known bisphenols.
- It is **produced by the condensation of phenol and acetone**, with an estimated 4 million tonnes of produced worldwide in 2015.
- It is a **colourless solid** which is soluble in organic solvents, but poorly soluble in water (0.344 wt % at 83 °C).
- BisphenolA (BPA) is a chemical produced in large quantities for use primarily in the **production of polycarbonate plastics**.
- It is found in various products including shatterproof windows, eyewear, water bottles, and epoxy resins that coat some metal food cans, bottle tops, and water supply pipes.
- The primary source of exposure to BPA for most people is through the
- While air, dust, and water are other possible sources of exposure, BPA in food and beverages accounts for the majority of daily human exposure.
- Bisphenol A can **leach into food from the protective internal epoxy resin coatings** of canned foods and from consumer products such as polycarbonate tableware, food storage containers, water bottles, and baby bottles.
- The degree to which BPA leaches from polycarbonate bottles into liquid may depend more on the temperature of the liquid or bottle, than the age of the container.
- BPA can also be **found in breast milk**.
- BPA is a known **endocrine disruptor**.
- Generally, BPA **acts on hormonal level by distorting hormonal balance** and inducing estrogenic effects through binding with estrogen-related receptors (ERR).
- The resultant effects are numerous of which hormonal related abnormalities have been mostly reported.

82. Great Nicobar project

Section: Places in news

Concept :

- Citing a "strategic" imperative, the Union Home Ministry wanted the 8.45-square-km airport component of the **Great Nicobar Development project** to be kept confidential.
- However, the Environment Ministry, in an unprecedented move, has withheld all discussions on the forest clearance to the entire 166.10-sq km project recommended by the **statutory Forest Advisory Committee (FAC)** in which the airport falls.

About Great Nicobar Development project

- A "greenfield city" has been proposed, including

- An International Container Transshipment Terminal (ICTT),
- A greenfield international airport,
- A power plant

Forest Advisory Committee

- Forest Advisory Committee is a statutory **body constituted under the Forest (Conservation) Act 1980**.
- It comes under the **administrative control of the Ministry of Environment, Forests & Climate Change (MoEF&CC)**.
- It is an apex body tasked with **adjudicating requests by the industry to raze forest land for commercial gains**.
- It considers questions on the diversion of forest land for non-forest uses such as mining, industrial projects, townships.
- It also advises the government on the issue of granting forest clearances. However, **its role is advisory**.
- Every **proposal involving more than 40 hectares of forest land** are referred to the Central Government to the Forest Advisory Committee (FAC).
- FAC may also suggest any condition or restrictions on the use of any forest land for any non-forest purpose, which in its opinion, would minimize adverse environmental impact.
- The MoEF&CC may grant approval after considering the advice of the FAC.
- **FAC is headed by Director General of Forests**, Ministry of Environment and Forests as Chairperson and 3 other officials.
- It also contains three non-official members who are experts one each in Mining, Civil Engineering and Development Economics.

83. E-Waste (Management) Rules 2022

Section: Pollution

Context: The Government notified the E-Waste (Management) Rules, 2022, on November 2, 2022. These **rules will replace the E-waste (Management) Rules, 2016**, and will be effective from April 1, 2023. These rules will launch a **new Extended Producer Responsibility (EPR) regime for e-waste recycling**.

E-Waste (Management) Rules, 2022

- **The salient feature of new rules is as under:**
 - Applicable to every manufacturer, producer, refurbisher, dismantler, and recycler who must register with CPCB.
 - **No entity shall carry out any business without registration** and not deal with any unregistered entity.
 - The **authorization has now been replaced by registration through an online portal**, and only manufacturers, producers, refurbishes and recyclers require registration.
 - It includes the provision of an **EPR framework with the mandatory requirement of 'Registration of Stakeholders'** (manufacturer, producer, refurbisher, and recycler).
 - A **'digitalized systems approach'** is also proposed in the new rules (2022) which will address the challenges of the weak monitoring systems, lack of transparency, inadequate compliance, and channelizing processing to the informal sector (which is a violation of the law).
 - A **common digital portal** will also reduce instances of 'paper trading' or 'false trails'. It means the practice of falsely revealing 100% collection on paper while collecting and/or weighing 'scrap' to meet targets.
 - It also briefly touches on the two aspects namely 'component recovery' and 'residual disposal'.
 - **Component recovery** refers to adequate and efficient recoveries of rare earth metals so as to reduce dependence on virgin resources.
 - **Residual disposal** means the safe disposal of the 'residual' material during the e-waste recycling process.
- **Schedule I has been expanded**, and now 106 Electrical and Electronic Equipment (EEE) have been included under the EPR regime.
- Producers of notified EEE have been **given annual E-Waste Recycling targets** based on the generation from the previously sold EEE or based on sales of EEE, as the case may be.
- **Management of solar PV modules /panels/ cells added** in new rules.
- The **recycled quantity will be computed** based on end-products to avoid false claims.
- Provision for **generation and transaction of EPR Certificate** has been introduced.
- Provisions for **environmental compensation and verification & audit** have been introduced.
- Under these rules, a **provision for reducing hazardous substances** in the manufacturing of EEE has been provided. It mandates that every producer of EEE and their components shall ensure that their **products do not contain lead, mercury, and other hazardous substances beyond the maximum prescribed concentration**.

E waste:

- The International Telecommunication Union defines e-waste as **all items of electrical and electronic equipment (EEE)** and its parts that have been **discarded by its owner as waste** without the intent of re-use.
- This waste is **classified into six categories**: Cooling and freezing equipment like refrigerators, freezer other equipment such as televisions, monitors, laptops, notebooks and tablets.
- It also **comprises fluorescent lamps** and other large and small equipment like washing machines, clothes dryers, dish-washing machines, vacuum cleaners and microwaves.

- The e-waste stream contains diverse materials — most prominently hazardous substances such as **lead, polychlorinated biphenyls (PCBs), polybrominated biphenyls (PBBs), mercury**, polybrominated biphenyl ethers (PBDEs), brominated flame retardants (BFRs), and valuable substances such as **iron, steel, copper, aluminum and plastics**.
- **Decomposing e-waste is an expensive process** and only a few developed countries can afford to do so.
- Laws to manage e-waste have been in place in India since 2011, mandating that only authorized dismantlers and recyclers collect e-waste. **E-waste (Management) Rules, 2016** was enacted in 2017.
- **India's first e-waste clinic** for segregating, processing and disposal of waste from household and commercial units has been set-up in **Bhopal, Madhya Pradesh**.

Extended Producer Responsibility (EPR)

- It is a **policy approach** under which **producers are given a significant responsibility** financial and/or physical for the **treatment or disposal of post-consumer products**.
- Assigning such responsibility could in principle **provide incentives to prevent wastes** at the source, **promote product design for the environment** and support the achievement of public recycling and materials management goals.

84. Biogas-linked Toilets

Context: Despite cultural, technical and other challenges, Kolhapur makes progress in adoption of biogas-linked toilets

More on the News:

- **25% of the toilets in Maharashtra's Kolhapur district** are linked to biogas units that convert the waste to fuel while tackling faecal sludge on the spot.
- This is significant given that in general in India, there is a taboo attached to using human excreta to generate biogas, which is then used in cooking.

Biogas:

- Biogas is based upon the **use of dung to produce gas** which is used as domestic fuel, especially in rural areas
- Biomass has always been an important energy source for the country considering the benefits it offers. It is **renewable, widely available, carbon-neutral** and has the potential to provide significant employment in the rural areas
- The technique is based on the decomposition of organic matter in the **absence of air**, to yield gas consisting of **methane (55%) and Carbon Dioxide(45%)**, which can be used as source of energy.
- **Procedure to make Biogas**
- A typical biogas plant in India has **cow dung as its main feedstock** and consists of **three parts** – an **inlet** from where dung mixed with water is fed, a **digester**, and an **outlet connected to a slurry collection tank**. The human toilet is directly connected to the digester via a PVC pipeline and does not require manual handling.
- The increased pressure **from the gas forces out the slurry**, the by-product of the process, into the slurry storage tank. The slurry, retained in the **digester for 20-30 days**, decomposes most pathogens and weed seeds, **making nitrogen-rich manure**.
- Biogas is derived from waste, unlike bioethanol or bio-diesel, so it does not involve competition with land and biodiversity for food products.
- It can be **used as cooking and lighting fuel**; and the left over slurry serves as an enriched manure
- This has taken deep roots in India, as it has **higher thermal efficiency** when compared with Kerosene, firewood, dung and charcoal
- About 32% of the total primary energy use in the country is still derived from biomass and more than 70% of the country's population depends upon it for its energy needs.

Schemes:

- **Biomass power & cogeneration programme:** is implemented with the main objective of **promoting technologies for optimum use of country's biomass resources** for grid power generation. Biomass materials used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, de-oiled cakes, coffee waste, jute wastes, groundnut shells, saw dust etc.
- **Ministry of Drinking Water & Sanitation has launched the GOBAR** (Galvanizing Organic Bio-Agro Resources) – DHAN scheme to **convert organic waste**, especially cattle waste, to biogas and organic manure for use in rural areas.

85. Human-animal Conflict in Kerala

Context: Amid farm losses and fragmented habitats, Kerala struggles to mitigate human-wildlife conflict.

Reason for Human-animal Conflict in the region:

- **Densely populated human settlements** near protected forests, with many farm lands in proximity of wild habitats.
- Lack of agricultural produce inside the forest.
- **Changing crop patterns:** Banana and cashew trees were not traditionally cultivated in these areas are cultivated now
- **Fragmentation of wildlife:** Elephants were long-range animals, but they are currently confined to small patches of forest due to fragmentation.

- **The inappropriate disposal of biowaste:** which draws not only monkeys but also other wild animals. They **might multiply** once there is an **abundance of food**.
- **Poor compensation for crop failure:**
- 165 rupee per cashew tree, which is nothing near proportional to the labour of a farmer and yield market.
- Only those who have insured their crops under the scheme are eligible to apply.

Kottiyoor wildlife sanctuary:

- Kottiyoor Wildlife Sanctuary is a wildlife sanctuary located in Kottiyoor village in **Kannur district of Kerala**.
- The Kottiyoor wildlife sanctuary shares its boundaries with **the Brahmagiri wildlife sanctuary in Karnataka, and the Wayanad and Aralam wildlife sanctuaries in Kerala**.
- Forests in the sanctuary include **evergreen forests, semi-evergreen forests, deciduous forests and grasslands**.
- The **Bavali River, a tributary of Valapattanam River** flows through the boundaries of the sanctuary.

86. Great Backyard Bird Count

Context: Bengal reports 489 species in Great Backyard Bird Count 2023

More on the News:

- **West Bengal reported the highest number of species** followed by Uttarakhand and Arunachal Pradesh during the Great Backyard Bird Count (GBBC) 2023 across 35 States and Union Territories from February 17-20.
- Kerala, on the other hand, recorded the highest number of checklists of birds.
- The GBBC 2023 **showed India's birds are thriving in diverse habitats** from the city to the countryside. A remarkable increase in participation across the country helped **India upload the second-highest number of checklists** after the United States of America and the third-highest species of any country.

Great Backyard Bird Count

- The Great Backyard Bird Count (GBBC) is an annual citizen science project that takes place **over four days** in February.
- The purpose of the GBBC is to **engage bird watchers of all ages and skill levels in collecting data on bird populations** and distribution around the world.
- During the GBBC, participants are asked to count birds in their backyard, local park, or any other location for at least 15 minutes and **report their sightings online**.
- The data collected during the GBBC helps researchers and conservationists understand changes in bird populations and inform conservation efforts.
- The GBBC was first launched in 1998 and has since become a popular event, with tens of thousands of people from over 100 countries participating each year. In addition to collecting important data, the GBBC also provides an opportunity for people to connect with nature and learn more about the birds in their area.

87. Underwater noise emissions by ships pose threat to Indian marine species

Section: Pollution

Context: The rising man-made (anthropogenic) underwater noise emissions (UNE) from ships in the Indian waters are posing a threat to the life of marine mammals like Bottlenose Dolphin, Manatees, Pilot Whale, Seal, and Sperm Whale.

More on the News:

- The **main form of energy for multiple behavioural activities** of marine mammals, which include mating, communal interaction, feeding, cluster cohesion and foraging, is **based on sound**.
- However, the **sound that radiates from ships on a long-term basis affects them** and results in internal injuries, loss of hearing ability, change in behavioural responses, masking, and stress.

Sources of Marine Noise Pollution :

- **Shipping:** Large commercial ships, as well as recreational boats, produce a significant amount of noise through their engines and propellers. This noise can be **particularly loud in shallow water**, and can impact marine life in the surrounding area.
- **Seismic surveys:** Seismic surveys are used **to locate oil and gas reserves beneath the ocean floor**. The surveys involve the use of air guns that produce intense bursts of sound, which can be harmful to marine life, particularly whales and dolphins.
- **Underwater construction:** Construction activities such as **drilling, pile driving, and dredging** can produce significant amounts of noise, which can impact marine life in the area.
- **Military sonar:** Military ships and submarines **use sonar to detect other vessels and underwater obstacles**. The high-intensity sound produced by sonar can be harmful to marine life, particularly whales and dolphins.

Effects of Marine Noise Pollution:

- **Disorientation:** Loud noises can disorient marine animals and **cause them to become confused or disoriented**, which can lead to injury or death.

- **Behavioral changes:** Noise pollution can alter the behavior of marine animals, such as their **feeding patterns or migration routes**, which can have long-term effects on the health of the population.
- **Masking of communication:** Loud noises can mask the communication signals of marine animals, making it difficult for them to locate potential mates, communicate with their offspring, and find food.
- **Physiological stress:** Exposure to loud noises can cause physiological stress in marine animals, which can **weaken their immune system** and make them more susceptible to disease.
- **Strandings:** Some marine animals, particularly whales and dolphins, are sensitive to sound and can become disoriented by loud noises. This can result in strandings, where the **animals beach themselves and often die**.
- More about effects <https://optimizeias.com/noise-pollution-affects-dolphins-ability-to-communicate/>

Global initiatives to tackle Marine noise Pollution

- **International Maritime Organization (IMO):** The IMO is a specialized agency of the United Nations that is responsible for **regulating shipping activities**. The organization has **developed guidelines for reducing the noise produced by ships**, such as **limiting the speed of ships in certain areas** to reduce noise levels.
- **International Whaling Commission (IWC):** The IWC is an intergovernmental organization that is **responsible for the conservation and management of whale populations**. The organization has called for a **reduction in underwater noise pollution**, particularly from seismic surveys and military sonar, as a means of protecting whale populations.

Geography

1. Rare earth elements and critical minerals

Section : Economic Geography

Context: Rare earth elements and critical minerals will be next geopolitical battleground: Economic Survey

More on the News:

- REE and CM are essential for generating renewable energy (RE). The problem is that they are produced in a few countries and processed in even fewer countries.
- A globally **synchronised energy transition to non-fossil fuels** might be difficult to pull off if adequate REE and CM are not available. That would leave fossil fuel-based assets stranded for many countries' economies.
- Survey pointed out while **the demand for CMs is set to increase** because of the global preference and emphasis towards RE, the **global CM supply chain is highly concentrated and unevenly distributed**. The skewed distribution of resources **poses a supply risk** in the face of its enhanced demand.
- A **carefully crafted multi-dimensional mineral policy** would reduce our dependence and address the problems for the future. The country has resources of nickel, cobalt, molybdenum, and heavy REEs, but **further exploration would be needed to evaluate the quantities of their reserves**.
- There is a **need to create strategic mineral reserves along the lines of strategic petroleum reserves to ensure a continuous supply of minerals**. Also, policies should consider **investing in internal research including technological innovation** for mineral exploration and processing and the development of Recycling, Reusing, and Repurposing (R3) technologies.

Rare earth Elements:

- These are a set of **17 chemical elements in the periodic table**, specifically the **15 lanthanides plus scandium (Atomic Number 21) and Yttrium (Atomic Number 39)**.
- Lanthanide series comprises the **15 metallic chemical elements** with atomic numbers 57 through 71, from lanthanum through lutetium.
- **Scandium and yttrium are considered rare-earth elements** because they tend to occur in the same ore deposits as the lanthanides and exhibit similar chemical properties, but have different electronic and magnetic properties.
- **Cerium (AN 58) is the most abundant rare earth metal**.
- Their colour ranges from **Shiny Silver to Iron Gray**. They are soft, malleable, ductile and usually reactive, especially at elevated temperatures or when finely divided.
- Its **application ranges from Civilian (smartphones, laptops, petroleum refining catalysts) to military including nuclear applications**. Rare minerals that are essential to electric vehicles, wind turbines and drones.
- **China has the largest reserve** (37 percent), followed by Brazil and Vietnam (18 percent each), Russia (15 percent), and the remaining countries (12 percent). Deng Xiaoping said once, The Middle East has oil and China has rare earth.
- Why these elements called as RARE?
 - There is **no shortage of rare earths**. But their extraction is difficult (Requires high skill, Capital intensive, Environmental issues).

Critical Minerals

- Critical minerals are elements that are the **building blocks of essential modern-day technologies**, and are at risk of supply chain disruptions.

- These minerals are now used everywhere from making mobile phones, computers to batteries, electric vehicles and green technologies like solar panels and wind turbines.
- Based on their individual needs and strategic considerations, different countries create their own lists.
- However, such lists mostly include **graphite, lithium, cobalt, rare earths and silicon** which is a key mineral for making computer chips, solar panels and batteries.
- **Aerospace, communications and defence industries** also rely on several such minerals as they are used in manufacturing fighter jets, drones, radio sets and other critical equipment.

Why is this resource critical?

- As countries around the world scale up their **transition towards clean energy and digital economy**, these critical resources are key to the ecosystem that fuels this change.
- Any **supply shock can severely imperil the economy and strategic autonomy** of a country over-dependent on others to procure critical minerals.
- But these supply risks exist due to rare availability, growing demand and complex processing value chain.
- Many times the complex supply chain can be **disrupted by hostile regimes, or due to politically unstable regions**.
- They are critical as the world is fast shifting from a fossil fuel-intensive to a mineral-intensive energy system.

2. Upper Bhadra project

Section :Indian Geography

Concept:

- Finance Minister recently announced a **grant of ₹5300 crore for the Upper Bhadra Irrigation Project**.

Upper Bhadra project

- It is a major lift irrigation Scheme under implementation in the central region of Karnataka State.
- Major objective is to **provide sustainable irrigation facility in kharif season**.
- It also proposes to **recharge ground water tables and provide drinking water** by filling 367 tanks with six tmcft water in drought-prone taluks.
- It is planned to irrigate an extent of 2,25,515 hectares by micro irrigation in drought-prone districts of Chikkamagalur, Chitradurga, Tumkur and Davangere.
- It envisages lifting upto 17.40 TMC of water in first stage from **Tunga river to existing Bhadra reservoir** and lifting 29.90 TMC of water in second stage from Bhadra reservoir to Tunnel near Ajjampura, in **Tungabhadra sub-basin** of Krishna basin.
- In 2022, Central government gave **national project status to “Upper Bhadra Project”**.

Tungabhadra River:

- It is a sacred river in southern India that flows through the states of **Karnataka, Andhra Pradesh and Telangana**.
- The ancient name of the river was Pampa.
- It is formed by the confluence of two rivers, the Tunga River and the Bhadra
- Both **Tunga & Bhadra Rivers** are **originated on the eastern slopes of the Western Ghats**.

National Project Status

- **Eligibility criteria** for inclusion of a project under **National Projects (NP) scheme** being serviced by this Ministry, are as below:
- International projects, where usage of water in India is required by a treaty or where planning and early completion of the project is necessary in the interest of the country.
- or
- Inter-State projects which are dragging on due to non-resolution of Inter-State issues relating to sharing of costs, rehabilitation, aspects of power production etc., including river interlinking projects.
- or
- Intra-State projects with additional irrigation potential of more than two lakh hectare and with no dispute regarding sharing of water and where hydrology is established.
- or
- Extension, renovation and modernization (ERM) projects envisaging extension/ restoration of irrigation potential of 2 lakh hectare.
- However, **mere eligibility of a project does not entitle its inclusion** under the NP scheme.
- Inclusion is also **dependent upon approval of Advisory Committee on Irrigation, Flood Control and Multipurpose projects** of DoWR, RD&GR as per laid down procedure, investment clearance, recommendations by High Powered Steering Committee, availability of funds as well as Government priorities at that time, etc.

- **Central assistance in the form of grant under NP scheme**, is given on the balance works component of the **project** pertaining to irrigation and drinking water only.

Funding Pattern

- Projects in 8 North-Eastern, 2 Himalayan States (Himachal Pradesh and Uttarakhand) and Union Territories of Jammu & Kashmir and Ladakh – **90 (Centre) : 10 (State)**
- Projects in other states – **60 (Centre) : 40 (State)**

3. Deep Ocean Mission gets Rs 600 crore

Section: Economic Geography

Concept:

- The **Centre's Deep Ocean Mission**, which aims to explore marine biodiversity for the sustainable use of resources, has been allocated Rs 600 crore in the Union Budget 2023-2024.
- The government has **doubled the allocation from last year's revised fund of Rs 300 crore**.
- The ministry aims to allot money to a myriad of activities such as a manned submersible, ship-building, exploration and conservation of deep-sea biodiversity and identification of mineral deposits in the deep ocean.

Deep Ocean Mission

- The cost of the Mission has been estimated at Rs. 4,077 crore over a five-year period and will be implemented in phases.
- **MoES will be the nodal ministry** implementing this multi-institutional ambitious mission.
- It will be a **mission mode project to support the Blue Economy Initiatives** of the Government of India.
- Blue Economy is the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health.
- The technology and expertise needed in such missions is now available with only five countries – **US, Russia, France, Japan and China**.
- **India will now be the sixth country to have it.**

Major Components:

- **Development of Technologies for Deep Sea Mining, and Manned Submersible:**
- A manned submersible will be developed to carry three people to a depth of 6,000 metres in the ocean with a suite of scientific sensors and tools.
- An Integrated Mining System will be also developed for mining polymetallic nodules at those depths in the central Indian Ocean.
- **Polymetallic nodules** are rocks scattered on the seabed containing iron, manganese, nickel and cobalt.
- The exploration studies of minerals will pave the way for commercial exploitation in the near future, as and when commercial exploitation code is evolved by the **International Seabed Authority, an United Nations (UN) organisation**.
- **Development of Ocean Climate Change Advisory Services:**
- It entails developing a suite of observations and models to understand and provide future projections of important climate variables on seasonal to decadal time scales.
- Technological Innovations for Exploration and Conservation of Deep-sea Biodiversity:
- Bio-prospecting of deep-sea flora and fauna including microbes and studies on sustainable utilization of deep sea bio-resources will be the main focus.
- **Deep Ocean Survey and Exploration:**
- It will explore and identify potential sites of multi-metal Hydrothermal Sulphides mineralization along the Indian Ocean mid-oceanic ridges.
- **Energy and Freshwater from the Ocean:**
- Studies and detailed engineering design for offshore **Ocean Thermal Energy Conversion (OTEC)** powered desalination plants are envisaged in this proof of concept proposal.
- **OTEC is a technology which uses ocean temperature differences from the surface to depths lower than 1,000 meters**, to extract energy.
- **Advanced Marine Station for Ocean Biology:**
- It is aimed at the development of human capacity and enterprise in ocean biology and engineering.
- It will translate research into industrial application and product development through on-site business incubator facilities.

Significance of the Mission:

- The 'Deep Ocean Mission' plan will enable India to develop capabilities to exploit resources in the **Central Indian Ocean Basin (CIOB)**.
- India has been allotted **75,000 square kilometres in the Central Indian Ocean Basin (CIOB)** by **UN International Sea Bed Authority for exploration of poly-metallic nodules**.
- CIOB reserves contain deposits of metals like iron, manganese, nickel and cobalt.

Potential:

- It is envisaged that 10% of recovery of that large reserve can meet the energy requirement of India for the next 100 years.
- It has been estimated that 380 million metric tonnes of polymetallic nodules are available at the bottom of the seas in the Central Indian Ocean.

4. Lake sediments and Paleoclimate

Section : Physical geography

Context: Lake sediments are useful paleoclimate proxies that provide information about the environmental changes and human-induced pressures on the ecosystem: Paleoclimate scientist Anoop Ambili.

Paleoclimate:

- Paleoclimate refers to the **study of past climates**, primarily through the analysis of natural records such as tree rings, ice cores, lake and ocean sediments, and fossils.
- The goal of paleoclimate research is to **understand the processes that have driven past climate changes, the patterns and variability of these changes**, and the impact of past climate on the environment and human societies.
- Paleoclimate records can **provide valuable information about long-term trends and patterns in climate**, as well as past climate extremes, such as droughts, hurricanes, and glacial periods.
- This information is useful for making predictions about future climate change and its potential impacts on the environment and human populations.

Paleoclimate and Lake Sediments:

- Lake sediments are **indicators of sensitive environmental** Studying different lake systems in the Indian subcontinent through different years can give a paleoclimate scientist, a **clear picture of anthropogenic-stressors and natural stressors** over several thousand years.
- Lake sediments can **provide valuable information about past climatic conditions** because they accumulate in a relatively undisturbed manner over long periods of time.
- The sediment layers can **contain a range of materials, including organic matter, minerals, and microfossils**, that provide a record of environmental changes.
- For example, **changes in the types and amounts of pollen** in sediment layers can indicate changes in the types of plants growing in the area, which can in turn **provide information about past temperature and precipitation patterns**.
- Other indicators, such as the presence of certain types of **algae or mineral layers**, can also provide information about past climate conditions. By analyzing these sediment records, scientists can gain a better understanding of how past climate conditions have influenced the environment and how they may have affected human societies.
- Especially in the past 100 years, freshwater ecosystems are being shaped naturally and anthropogenically. And sadly, there is **so much anthropogenic influence** nowadays, in these freshwater ecosystems.
- The anthropogenic influence has taken a huge toll on the system, there is a regime shift, there is **harmful algal blooms**, there is so much which is happening or large-scale **eutrophication, hypoxia**.
- There is an urgent need for **awareness among the community and social media** has a huge role to play to preserve this ecosystem.

5. Turkey hit by series of powerful earthquakes

Section : Physical Geography (Geomorphology)

Concept:

- More than 2,000 people have been killed and thousands injured by a huge earthquake which struck south-eastern Turkey, near the Syrian border.
- The earthquake, which hit near the town of Gaziantep, was closely followed by numerous aftershocks – including one quake which was almost as large as the first.
- Turkey's President Recep Tayyip Erdogan said the earthquake that hit the area around Gaziantep, was the country's worst disaster since Erzincan earthquake, 1939.

Erzincan earthquake

- The Erzincan earthquake measured 7.8 on the Richter scale, occurred on the **North Anatolian Fault Zone (NAFZ)**, and created a **360-km-long surface rupture**.
- It killed about 33,000 people and caused extreme damage in the Erzincan Plain and the Kelkit River Valley.

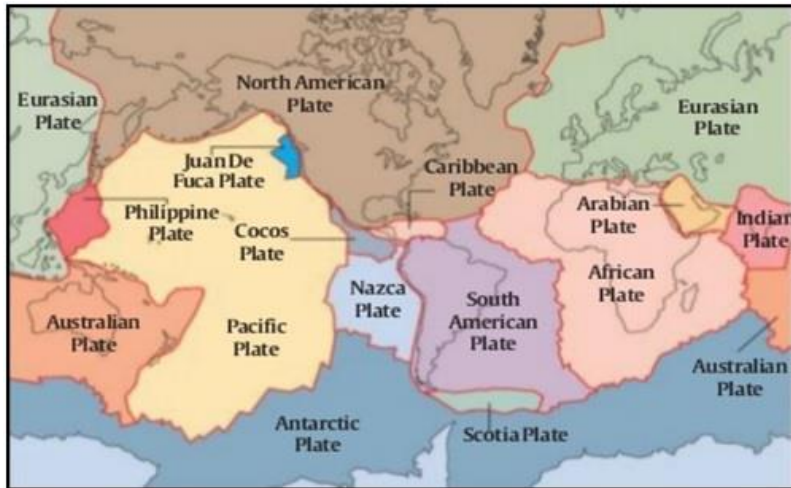
Earthquake

- An earthquake is an intense shaking of the ground caused by movement under the earth's surface.
- It happens when two blocks of the earth suddenly slip past one another.
- This releases stored-up 'elastic strain' energy in the form of seismic waves, which spreads through the earth and cause the shaking of the ground.

- The location below the earth's surface where the earthquake starts is called **the hypocenter**, and the location directly above it on the surface of the earth is called the

Causes of earthquake

- The earth's outermost surface, crust, is fragmented into tectonic plates. The edges of the plates are called plate boundaries, which are made up of faults.
- The tectonic plates constantly move at a slow pace, sliding past one another and bumping into each other.
- As the edges of the plates are quite rough, they get stuck with one another while the rest of the plate keeps moving.
- Earthquake occurs when the plate has **moved far enough and the edges unstick on one of the faults**.



How are earthquakes measured?

- They are measured on a scale called the **Moment Magnitude Scale (Mw)**.
- This has replaced the **Richter scale (magnitude scale)**, now considered outdated and less accurate. **Richter scale relates to the energy released** during the earthquake which is expressed in absolute numbers, 0-10.
- The **intensity scale/ Mercalli scale takes into account the visible damage** caused by the event. The range of intensity scale is from 1-12
- The number attributed to an earthquake represents a combination of the distance the fault line has moved and the force that moved it.
- A tremor of 2.5 or less usually cannot be felt, but can be detected by instruments.
- Quakes of up to five are felt and cause minor damage.
- The Turkish earthquake at 7.8 is **classified as major and usually causes serious damage**
- Anything above 8 causes catastrophic damage and can totally destroy communities at its centre.

Can earthquakes be predicted?

- An accurate prediction of an earthquake requires some sort of a precursory signal from within the earth that indicates a big quake is on the way.
- Moreover, the signal must occur only before large earthquakes so that it doesn't indicate every small movement within the earth's surface.
- Currently, there is **no equipment to find such precursors, even if they exist**.

Reasons for earthquakes in Turkey

- The region where the earthquake has struck lies along a well-known **seismic fault line called the Anatolia tectonic block**.
- It is a **seismically active zone** — though not as active as, say, the Himalayan region.
- The seismicity in this region is a result of interactions between the African, Eurasian, and Arabian plates.
- In the present case, it was the Arabian plate moving northwards and grinding against the Anatolian plate.
- Also, the **present earthquakes emerged from relatively shallow depths** which made them devastating.
- **Shallow earthquakes** are generally more devastating because they **carry greater energy when they emerge on the surface**.



- Due to faultlines running across Turkey's southeast and north, the country has always been a hotbed of seismic activity

Turkey is a hotbed of Seismic activity

- In the eastern Mediterranean region comprising Turkey, Syria and Jordan, tectonics are dominated by complex interactions between the **African, Arabian, and Eurasian tectonic plates, and the Anatolian tectonic block.**
- Dominant structures here are:
- Red Sea Rift, the spreading centre between the African and Arabian plates;
- Dead Sea Transform, a major strike-slip fault (explained in the diagram below) that also accommodates Africa-Arabia relative motions;
- **North Anatolia Fault, a right-lateral strike-slip structure in northern Turkey** accommodating much of the translational motion of the Anatolia block westwards with respect to Eurasia and Africa;



- **Cyprian Arc**, a convergent boundary between the Africa plate and the Anatolia block.
- A convergent plate boundary is formed when tectonic plates crash into each other. They are also known as **destructive boundaries.**

6. Empower local communities to conserve, sustainably use Himalayan resources

Section: Geomorphology (Physical Geography)

Context: Recent sinking of Joshimath

Himalayan ecology:

- The Himalayas, formed **50 million years ago** due to the Indian landmass crossed the prehistoric **tethys sea** and bumped into the **Asian mainland**, are still quite fragile.
- Himalayas are still rising slowly and are susceptible to earthquakes.
- As the Himalayas evolved the slope were covered with vegetation of oak and rhododendron that firmly held the soil and water preventing erosion and landslides.
- Human settlement developed leaving the forest cover intact, Joshimath is one such old settlement.

Exploitation of Himalayan forests:

- **Forest exploitation:**
- The scenario changed during British colonial period. Colonial powers were solely interested in resource exploitation.

- British began leasing the forests from ruler of Tehri in 1905.
- When the reserve forests were being demarcated, some officials reported that these could not sustain commercial forestry and recommended that they be converted into community managed forests.
- The government disagreed but later introduced a provision in the Indian Forest Act 1927, to declare reserved forests as village forests and hand over their management to communities.
- The **first van panchayats (village forest councils)** were constituted in the 1930s, in Garhwal and Kumaon Himalayas.
- The colonial forest management regime has continued unabated even after Independence, progressively weakening the highly efficient van panchayats.
- **Water exploitation:**
- The **Himalayan region's watercourses** have also been silted up by quarrying of limestone, required for the construction of roads and buildings.
- As a result, the beds of these watercourses, such as those in Mussoorie, have become broader and destroyed farmland.
- The government ordered that mining be stopped only when it was concluded that the cost of destroying the farmland exceeded the benefits from mining.
- However, the courts put a stay on this order and the mining continued with damaging consequences.
- Projects such as Tehri dam play a role in exacerbating effects of disasters, as seen during the 2021 Chamoli flash floods.
- Concern should be paid on **Himalayan regions carrying capacity**, and the focus should be shift towards **ecological restoration of Himalayas** through inclusive development and conservation.
- The **van panchayats** should be expanded by implementing the **Community forest Rights** provision of the **Forest Rights Act**.
- Effective implementation of **73rd and 74th constitutional amendments**.

Ecological carrying capacity:

- Carrying capacity is the maximum population size that an ecosystem can sustainably support without degrading the ecosystem. Deaths and long term damage to an ecosystem occurs when a population exceeds the carrying capacity of its ecosystem.
- Disease, competition, predator-prey interaction, resource use and the number of populations in an ecosystem all affect carrying capacity.

HYDROPOWER PROJECTS CONSTRUCTED BY THE DEPARTMENT AFTER CREATION OF THE STATE



Barrage at Uttarkashi



304MW Power House at Dharasu

7. On Joshimath: Hydropower projects in the Himalaya should be reconsidered given recent crisis

Section: Indian Physical Geography

Context: The crisis unfolding in **Joshimath** for over a month has led to conversations on the relevance of hydropower in the Himalayan region. Two years ago, a **glacier burst** led to question marks over the **Rishiganga hydroelectric project** in Uttarakhand.

Hydropower projects (HPP):

- Considered **green energy** because it generates electricity from the natural flow of water without releasing any emissions or pollutants.
- It also does not rely on fossil fuels.
- **Environmental impact:**
 - Large-scale hydroelectric dams impact **local ecosystems and communities**– they **displace people** and result in **loss of habitat for fish** and other wildlife.
 - Concerns about the potential conflicts over water resources in the region.
 - Construction of dams can **disrupt the flow of rivers**, leading to **changes in water temperature and chemistry**.
 - It can cause erosion, landslides, and sedimentation.

- Dams also disrupt the **migration patterns of fish** and other **aquatic species** and **impact the local wildlife**, particularly if the dam's construction leads to **habitat loss**.
- **HPPs in Himalayas:**
 - Subansiri Lower Hydroelectric Project in Arunachal Pradesh
 - Teesta Low Dam Hydroelectric Project in Sikkim
 - Arun III Hydroelectric Project Nepal
 - West Seti Hydroelectric Project, Nepal
 - Chukha Hydropower Project, Bhutan
 - Tala Hydropower Project, Bhutan

Alternative to HPPs:

- **Micro hydro** is a **small-scale hydroelectric power generation system** that typically generates up to **100 kilowatts (kW) of electricity**.
- These systems use the energy of falling water to turn a turbine, which, in turn, generates electricity.
- They can be used for various applications, including powering homes, businesses, and small communities.
- **Advantages of Micro hydro systems:**
 - Less expensive
 - Can be located in inaccessible areas
 - Reliable source of energy to communities
 - Smaller environmental footprint
- **Micro hydro systems** can be classified into **two main types – run-of-river and storage systems**.
 - **Run-of-river systems** use the natural flow of water in a stream or river to generate electricity.
 - In contrast, **storage systems** use a reservoir to store water and release it as needed to generate electricity.



Way forward:




- **Micro hydro systems** can be **tailored to minimise the ecosystem's negative impact** and provide **sustainable energy solutions**.
- However, it's important to note that even micro-hydropower projects can have some impact on the environment and local communities.
- A **detailed assessment** should be carried out to evaluate the potential impact before proceeding with the project.

8. Hydropower projects in Uttarakhand:

Section: Places in news

Section:

S.No.	Project		Year	Installed Capacity, MW
1.	Yamuna Hydroelectric Project Stage-I (Dakpathar Barrage, Dhakrani, Dhalipur Power House)		1965	84.75
2.	Yamuna Hydroelectric Project Stage-II Part 1 (Ichari Dam and Chhibro Power House)		1975	240

3.	Yamuna Hydroelectric Project Stage-II Part-2 (Khodri Power House)		1984	120
4.	Yamuna Hydroelectric Project Stage-IV Part 1 (Asan Barrage and Kulhal Power House)		1975	30
5.	Yamuna Hydroelectric Project Stage-IV Part 2 (Khara Hydroelectric Project)		1992	72
6.	Chilla Hydroelectric Project		1981	144
7.	Maneri Bhali Hydroelectric Project Stage-I		1984	90
8.	Ramganga Project, Kalagarh		1976	198

9. Himalayan plunder: Manipur landslides raise environmental questions

Section: Indian Physical geography

Context: A large landslide that struck the Tupul Railway station building site on June 30, 2022, resulted in 61 fatalities and 18 injuries.

More on the News:

- Extreme rains, long-term exposure to hill slopes cut for **development projects**, **debris obstructing the flow of Ijei river** and shifting land use patterns, such as deforestation, are thought to have contributed to the tragedy in the seismically active western Manipur region.
- The landslide was caused by an **extensive slope cut for the construction of the railway station**, presence of break in slope in the upslope area, **affluence convergence of water and unprotected slope cut for long duration** (from 2014 onwards).
- A major factor that caused the landslides was the **debris restricting the normal water flow of Ijei river**. The **materials dumped at the railway construction sites** and improper drainage made the hills geologically weak.
- **Changes in the land use pattern** on the top hill, caused by **deforestation, jhum cultivation and banana cultivation**, also accelerate soil erosion and might have triggered landslides.
- The fluctuation in the **ongoing precipitation pattern and excessive rainfalls** lead to the percolation of water below the slopes.
- **Contour cutting/ gentle slope cutting per hydrological aspect can prevent huge water flow** from uphill to downhill.
- Considering the long-term nature of the ongoing project, it is **necessary to adopt regulatory and monitoring mechanisms at the vulnerable slopes** along the railway line where the cut portion and yards are to be exposed.
- **Reassessment of slope stability** (Factor of safety) analysis for open cut and yard of the Jiribam-Tupul railway line, **regular drone survey and monitoring to detect mass movement along the open cuts** and yard as well as beyond railway land boundary before and after monsoon season without significant failure event, **detection of subtle slope movement will likely help mitigate the problem**.

10. India discovers lithium inferred resources in Jammu and Kashmir

Section : Economic Geography

Concept :

- India has discovered lithium-inferred resources to the tune of 5.9 million tonnes in the Salal-Haimana area of Reasi district of Jammu and Kashmir.
- According to a statement, the **Geological Survey of India (GSI) report on lithium resources**, along with 15 other resource-bearing geological reports (that are in general exploration and preliminary exploration stages) and 35 geological memoranda, were handed over to respective State governments during the 62nd Central Geological Programming Board (CGPB) meeting.

India's lithium reserves

- According to the Indian Mines Ministry, the government agencies made the small discovery of lithium resources at a site in Mandya, Karnataka. It is the country's first lithium reserve.
- Now, Lithium inferred resources have been found in the Reasi District of Jammu & Kashmir (UT).

Lithium Production in the world

- According to the US Geological Survey (USGS), global lithium production in 2019 stood at 77,000 tonnes.
- **Australia, Chile, China and Argentina are the world's top four lithium-producing countries.**
- Australia is by far the world's top producer of lithium, with an output of 42,000 tonnes in 2019.

About lithium

- Lithium is a **non-ferrous metal** and is one of the key components in EV batteries.
- It has the symbol Li and is a chemical element.
- It's a **silvery-white metal** with a delicate texture.
- It is the **lightest metal and the lightest solid element** under normal circumstances.
- It must be kept in mineral oil since it is very reactive and combustible.
- It is **both an alkali and a rare metal**.

Advantages of lithium

- **Increased applicability:** In order to take advantage of renewable energy, the need for bulk energy storage applications has been increasing. This includes electric vehicles (EVs) and backup electric storage systems.
- **The good life:** Lithium-ion-based batteries have a good rate of charging and they last longer.
- **Higher energy density:** The energy density of the Li-ion batteries is higher.
- **Wide usage:** Being primarily used in batteries, it also finds its use in glass, ceramics, rocket fuel and lasers.

How critical is lithium for India?

- The lithium deposits are **critical for India as the country puts its focus on electric mobility** for both public and private transport, especially in the country's prime cities such as New Delhi, Mumbai, Bangalore, Kolkata, and Chennai.
- These metals are **strategic in nature and have a wide range of applications** in nuclear and other high-tech industries, including electronics, telecommunications, information technology, space, and the military.

- India's Ministry of Mines further stated that 51 mineral blocks including Lithium and Gold were handed over to respective state governments.
- Out of the 51 mineral blocks, 5 blocks are of gold.
- Other blocks pertain to commodities like potash, molybdenum, and base metals.

About the Geological Survey of India (GSI)

- The Geological Survey of India (GSI) was established in 1851 to serve British interests in exploring coal deposits for the expansion of the railway network in the country.
- After independence in 1947, it has come **under the ambit of the mining ministry** and also serves as the top scientific base for geological explorations.
- The Geological Survey of India (GSI) is a **scientific agency of India**.
- The main functions of the GSI relate to the **creation and update of national geo-scientific information and mineral resource assessment**.
- It is **headquartered in Kolkata** and has **six regional offices** located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata.
- **Every state has a state unit.**

11. Kosi-Mechi link project

Section : Indian Physical Geography

Context: The Patna High Court has directed the Centre and Bihar government to set up Kosi Development Authority and interlink Kosi and Mechi rivers to tackle annual floods often caused due to excess water discharged from Nepal.

Concept:

- The judgment is path-breaking, as it gives a direction and substance to the Indo-Nepal treaty on Kosi river to ensure that Center-state and Indo-Nepal cooperation and joint effort come to the rescue of the people of Bihar
- Central government has suggested 60:30:10 formula that means 60 per cent Central grant, 30 per cent central loan and 10 per cent state share

Kosi-Mechi link project

- The project will irrigate about 69,000 hectares in Araria district, about 69,000 hectares in Purnea district, 39,000 hectares in Kishanganj district and 35,000 hectares in Katihar district.
- Kosi-Mechi project is designed to divert part of the Kosi River surplus water through the existing Hanuman Nagar Barrage by way of a 117 km long link canal to the Mechi River in the Mahananda Basin.
- The Kosi-Mechi link project will benefit Araria, Kishanganj, Purnia and Katihar districts
- It is known that approval has already been received from the state cabinet to start the work of Kosi-Mechi link project. In May 2022 itself, the state government had approved administrative and expenditure of about Rs 2.78 crore for DPR formation, survey and exploration work.
- The state government has approved budgetary provisions in the form of 60 percent central share and 40 percent state share, including this project in the national project by the central government.
- However, the state government continues to demand 90 percent central share and 10 percent state budgetary provision for the Kosi-Mechi link project on the lines of Madhya Pradesh's Ken-Betwa link project.
- A total of about 1397 hectares of land is required under this project, out of which 632 hectares is already acquired, while 765 hectares of private land is to be acquired.

Kosi

Origin: Confluence of three streams: Sun Kosi, Arun Kosi and Tamur Kosi from Tibet forms Kosi (**other major tributaries:** Indrawati, Likhu, Dudhkoshi, and Tama, from west to east, all 7 tributaries together forms Saptakosi)

Mouth: Ganges near Kursela in Katihar district.

Transboundary river flows through China, Nepal and India.

Barrage : Sapt Koshi, Kosi Barrage/Bhimnagar Barrage

- It rains the northern slopes of the Himalayas in Tibet and the southern slopes in Nepal.
- From a major confluence of tributaries north of the Chatra Gorge onwards, the Kosi River is also known as Saptakoshi, also called sorrow of Bihar.
- The river basin is surrounded by ridges which separate it from the Yarlung Tsangpo River in the north, the Gandaki in the west and the Mahananda in the east.
- It passes through the steep and narrow Chatra Gorge in Nepal.
- Catchment covers six geological and climatic belts varying in altitude from above 8,000 m (26,000 ft) to 95 m (312 ft) comprising the Tibetan plateau, the Himalayas, the Himalayan mid-hill belt, the Mahabharat Range, the Siwalik Hills and the Terai. The Dudh-Koshi sub-basin alone consists of 36 glaciers and 296 glacier lakes.
- Peaks located in the basin include Mount Everest, Kangchenjunga, Lhotse, Makalu, Cho Oyu and Shishapangma.

- Protected areas: Sagarmatha National Park, Koshi Tappu Wildlife Reserve(both in Nepal)

Mechi

Origin: Mahabharat Range in Nepal

Mouth: Mahananda River. Trans-boundary river flowing through Nepal and India.

Special Features:

- It flows through the Indian state of Bihar to join the Mahananda in Kishanganj district
- It's a tributary of Mahananda river

12. Why turkey earthquake more dangerous

Section: Physical geography (Geomorphology)

Context:

- Two large earthquakes, one of **magnitude 7.8** and closely followed by a **magnitude 7.5**, hit **south-eastern Turkey**, claiming at least 17,000 lives and counting, wreaking considerable damage in **Turkey** as well as **Syria**. Nearly 200 aftershocks have followed with earthquakes of **magnitude 6** being reported in the region three days after the first tremblor.

What causes earthquakes?

- The earth's crust is made up of roughly **15 massive segmented chunky slabs** called **tectonic plates** which are constantly in motion.
- The land on which buildings are built rests on these plates.
- The plates continually collide, push and grate against each other and the meeting points of these plates are made up of a series of **'faults.'**
- The pent-up energy from the moving plates, along faultlines, is often released when an **imbalance in pressure** causes rocks on either side of the fault to **re-adjust**.
 - One set of rocks rising up relative to the other is a **'normal'** fault, and one sliding down relative to the other is a **'reverse'**
 - When they grate or move past one another, it's a **'strike-slip.'**
 - The energy released travels as waves that cause the ground to shake.

What kind of earthquake occurred in Turkey and Syria?

- Turkey and Syria** lie at the confluence of **three plates** — the **Arabian Plate**, the **Anatolian Plate** and the **Eurasian Plate**, making the region an **extremely seismically active zone**.
- The **Arabian Plate** is inching north into Europe, causing the **Anatolian Plate** (which Turkey sits on) to be pushed out west.
- The bulk of Turkey sits on the **Anatolian Plate** between **two major faults**: the **North Anatolian Fault** and the **East Anatolian Fault**.
- Geologists say that the earthquakes were from a **'strike-slip'** which is typical of the earthquakes in the region.



Sources: USGS, The Geological Society of London, Reuters

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Why were these earthquakes so devastating and deadly?

- A **lack of enforcement of building codes in Turkey** and the timing of the earthquake in the early morning are believed to be major factors for the death and devastation inflicted.
- The region hosts many fault systems, so the region is highly prone to earthquakes.
 - At **magnitude 7.8**, the February 6 event is much bigger than the ones the area has experienced before. The fault system runs along nearly 190 km which is why the impact of the earthquakes was so far-ranging.
 - The second earthquake, of **5 magnitude**, occurred further to the north on a different but adjacent fault system called the **Sürgü Fault**.
- The aftershocks can be experienced as far away as **Cairo (950km)** and **Istanbul (815km)**.

Measurement of earthquakes:

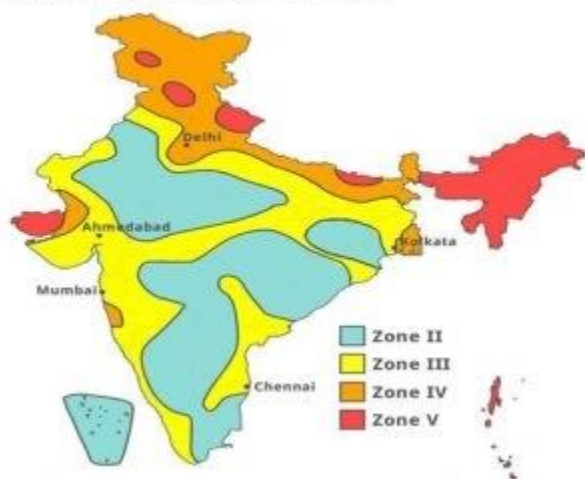
- The earthquake events are measured either according to the **magnitude** or **intensity of the shock**.
 - The **magnitude scale** is known as the **Richter scale**. The magnitude relates to the energy released during the quake. The magnitude is expressed in absolute numbers ranging between 0 and 10.
 - The **intensity scale** is named after **Mercalli**, an Italian seismologist. The intensity scale takes into account the visible damage caused by the event. The range of intensity scale is between 1 and 12.

13. Are there similarities to earthquakes in India? Can energy from latent pressure be built up over the years?

Section: Physical geography (Geomorphology)

- The **Indian Plate**, colliding into the **Eurasian plate** and **tilting upwards**, created the Himalayas.
- The **most common type of earthquake** in the **Himalayan region** is due to **reverse faults** because of the compressive forces between the two plates.
- Scientists have long warned of a **massive, overdue earthquake** in the **Garhwal-Kumaon range** here because of what is known about the pattern of quakes in the region.

Seismic zones in India



- The records of the last 300 or so years suggest that those earthquakes that have occurred haven't released all the pent-up energy and that's why geologists think a major one — maybe even an 8-magnitude one — is overdue.
- In the **Turkey-Syria earthquakes**, energy from nearly 300 years of accumulated strain was released.

How much does the magnitude of earthquakes correlate to the damage they inflict?

- The magnitude of the earthquake not exactly corresponds to the death and devastation.
- The impact of earthquakes can be reduced by:
 - Proper implementation of laws and rules on the building code of that region.
 - Proper awareness and rapid rescue plans.
 - Construction as per the earthquake zone.

Case study:1

- **Chile**, a country with a long history of devastating earthquakes (over 9), is considered to be a model for earthquake preparedness.
 - Despite experiencing earthquakes with **magnitudes over 8 in 2014 and 2015** casualties are extremely minimal due to years of strictly enforcing building codes.
 - This despite being a much poorer country than Japan, also known for its experience in earthquake-proofing structures.

Case study:2

- The **9-magnitude earthquake** that caused a tsunami and a radiation leak in the nuclear power plant in the country's Fukushima prefecture in 2011, didn't damage the stability of the structure.

14. Beaches in Visakhapatnam are now heading towards a disaster, say experts

Section: Indian Physical; Geography

Concept:

- It was reported in the Rajya Sabha that around 28.81 km of coastline in Visakhapatnam is prone to erosion.
- In 1930 two ships were sunk near the Dolphin's Nose in Vishakhapatnam to create a breakwater to control sedimentation at the mouth of harbour (during the construction of Visakhapatnam Port).
- Erosion was further aggravated by the construction of two breakwaters during the construction of the Outer Harbour (in the 1970s).

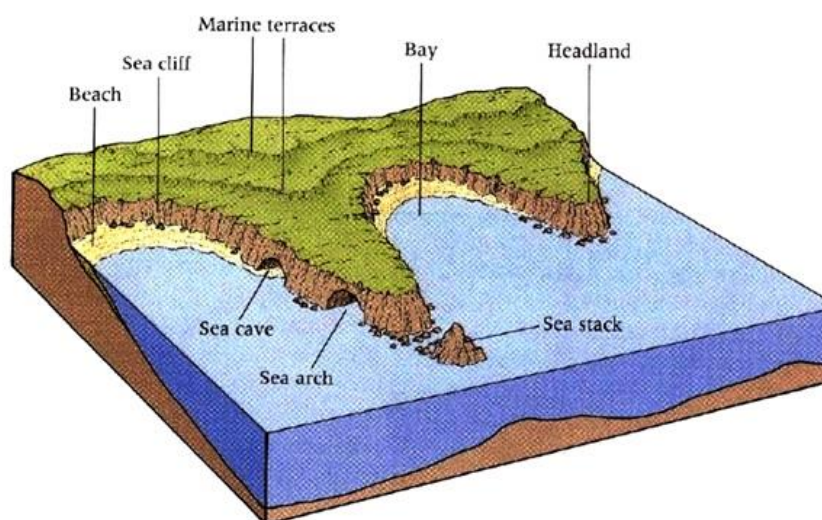
Significance of Beaches

- Beaches are dynamic landforms and the sand erosion and deposition of sand are majorly due to the high wave action and high wave energy.
- Experts point out that the **beaches act as cushions between the high wave action of the sea and the landmass.**
- Continuous nourishment of beaches through the natural process is essential and, if disturbed it might result in severe erosion.
- Due to the construction of breakwaters in the south, the sand is unable to reach the north parts hampering the natural nourishment of beaches.
- Beaches should be considered part of the sea instead of land.

Coastal erosion

- **Coastal erosion** is the process by which local sea level rise, strong wave action, and coastal flooding wear down or carry away rocks, soils, and/or sands along the coast.
- **Erosion and Accretion:** Erosion and accretion are **complementary to each other**. If the sand and sediments have drifted from one side, it must accumulate somewhere else.
- Soil erosion is the loss of land and human habitation as sea water washes off regions of soil along the coastline.
- Soil accretion, on the other hand, results in an increase in the land area.
- **Impact:**
- Recreational activities (sun bathing, picnicking, swimming, surfing, fishing, boating, diving, etc.) may be affected if existing beaches are reduced in width or disappear altogether. Also, there can be an impact on livelihoods of coastal communities.
- **Measures:**
- Coastal habitats such as **Mangroves, Coral Reefs and lagoons are recognized as the best defence against sea storms and erosion**, deflecting and absorbing much of the energy of sea storms.
- Therefore, it is important to maintain these natural habitats for shore protection as well as for environmental conservation.

What features does coastal erosion cause?



Causes for coastal erosion

- **Natural Phenomena:**
- **Wave energy** is considered to be the primary reason for coastal erosion.
- **Natural hazards** like cyclones, thermal expansion of seawater, storm surges, tsunami etc due to the melting of continental glaciers and ice sheets as a result of climate change hamper the natural rhythm and precipitate erosion.

- **Littoral Drift:**
- Strong littoral drift resulting in sand movement can also be considered as one of the major reasons for coastal erosion.
- Littoral drift means the natural movement of sediment along marine or lake shorelines by wave action in response to prevailing winds.
- **Anthropogenic Activities:**
- Dredging, sand mining and coral mining have contributed to coastal erosion causing sediment deficit, modification of water depth leading to longshore drift and altered wave refraction.
- Coastal erosion has been sparked by fishing harbours and dams constructed in the catchment area of rivers and ports reducing the flow of sediments from river estuaries.

15. Millet International Initiative For Research And Awareness (MIIRA)

Section : Agriculture

Concept :

- With food security and nutrition a top priority in agriculture during its G20 Presidency, India is planning to propose the launch of a **global initiative – MIIRA, to encourage the consumption and production of millets.**
- A draft charter of the initiative is ready and will be placed for approval at the first meeting of the Agricultural Deputies (under G20) from February 13-15 at Indore, MP.

Background

- The **United Nations General Assembly (UNGA) declared 2023 as the International Year of Millets (IYM)**, a proposal sponsored by the Government of India to promote these “nutri-cereals.”
- The declaration will be helpful to the Government of India in **articulating its goal of making IYM 2023 a “People’s Movement”** as well as presenting **India as the “Global Hub for Millets,” as India produces one-fifth of the world’s millets.**
- The year 2023 is also significant because of India’s G20 Presidency, which will also have five meetings on agriculture.
- In her Budget speech (2023-24), while describing various types of millets as ‘**Shree Anna**’, the Union **Finance Minister said that the Indian Institute of Millet Research, Hyderabad will be supported as the Centre of Excellence.**
- This will help in sharing best practices, research and technologies at the international level.

Millet International Initiative for Research and Awareness (MIIRA)

- The **global initiative** will be aimed at **coordinating millet research programmes at the international level** and will be launched keeping in mind the nutritional value and the climate resilient nature of millets.
- Besides **setting up a web platform to connect researchers and holding international research conferences**, the plan is also to **promote millet consumption by raising awareness.**
- **India would provide the “seed money” for MIIRA to take off, and each G20 member will subsequently be required to pay to its budget in the form of a membership fee.**
- According to the sources, the **MIIRA secretariat will be in Delhi**, and India being a major producer of millets, will ensure a flow of investment from the country’s industry and research bodies.

16. Hydroelectric plans in Arunachal will effect downstream Assam too

Section : Indian Physical Geography

Context: Arunachal Pradesh is highly susceptible to landslides; debris flowing downstream will change river behaviour, fear experts.

More on the News:

- A recent push by Arunachal Pradesh to realise its massive hydroelectric potential has faced criticism from activists, scientists and communities in the state as well as in the downstream Assam.
- Arunachal Pradesh is often **dubbed as the powerhouse of the country** and is home to 34 per cent (50,328 megawatts) of the country’s 148,701 MW hydropower potential, according to estimates of the Hydro Power Policy, 2008.
- About 150 hydropower projects have been proposed in the Himalayas across the state and have faced massive protests.
- However, analysts fear that the projects may **heavily affect the downstream areas in Assam.** There will be a massive change in the state’s economic and socio-cultural life, along with the river ecosystem.
- The rivers will **carry huge amounts of debris and sediments downstream** due to deforestation and earth cutting for the projects upstream, which will change the behaviour of the rivers.
- Massive landslides have already been experienced in the project site Subansiri Lower Hydroelectric Project at Gerukamukh. These incidents indicate that the **Eastern Himalayan part is more susceptible to landslides** and the slightest tampering may cause huge devastation.

Hydro-electric Project in Northeast India:

Project Name	River	State
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Subansiri Lower Hydroelectric Project	Subansiri River	Arunachal Pradesh
Kameng Hydroelectric Project	Kameng River	
Ranganadi Hydroelectric Project	Ranganadi River	
Naying hydropower project	Siyom river	
Emini hydropower project	Emini River	
Etalin Hydro Power Project	Dibang river	
Doyang Hydroelectric Project	Doyang River	Nagaland
Dikhu Hydroelectric Project	Dikhu River	
Uiam-Umtru Hydroelectric Project	Uiam River and Umtru River	Meghalaya
Myntdu Leshka Hydroelectric Project	Myntdu River	
Simsang Hydroelectric Project	Simsang River	
Borholla Hydroelectric Project	Borholla River	Assam
Kopili Hydroelectric Project	Kopili River	

About Hydro-electric Project <https://optimizeias.com/on-joshimath-hydropower-projects-in-the-himalaya-should-be-reconsidered-given-recent-crisis/>

17. Geological Exploration for Lithium

Section: Economic Geography

Concept:

- The Geological Survey of India (GSI) has categorized the recent discovery of lithium resources in **preliminary exploration, called the G3 stage.**
- According to The **United Nations Framework Classification for Resources (UNFC)**, there are **four stages of exploration for any mineral deposit:** reconnaissance (G4), preliminary exploration (G3), general exploration (G2), and detailed exploration (G1).

United Nations Framework Classification (UNFC):

- The **United Nations Framework Classification for Resources (UNFC)** is a resource project-based and principles-based classification system for **defining the environmental-socio-economic viability and technical feasibility of projects** to develop resources.
- UNFC provides a consistent framework to describe the level of confidence of the future quantities produced by the project.
- It is a **universally applicable scheme** for classifying/evaluating energy and mineral reserves/resources.
- It was **adopted in 2004 by the United Nations Economic Commission of Europe (UNECE).**
- The UNFC **consists of a 3-dimensional system** with the following three axes:
- The UNFC is a three-digit code-based system wherein:
 - First digit represents **economic viability axis**,
 - Second digit **represent feasibility axis**
 - Third digit represent **geologic axis**
- Each of these axes has further codes in decreasing order.

E Axis:

- The degree of economic viability (economic or potentially economic or intrinsically economic) is assessed in the course of prefeasibility and feasibility studies.

- A prefeasibility study provides a preliminary assessment with a lower level of accuracy than that of a feasibility study, by which economic viability is assessed in detail.
- The Economic viability has codes 1, 2 and 3 in decreasing order.

F Axis:

- Feasibility assessment studies form an essential part of the process of assessing a mining project.
- The typical successive stages of feasibility assessment i.e., geological study as initial stage followed by prefeasibility study and feasibility study/mining report are well defined.
- The feasibility assessment has codes 1, 2 and 3.

G Axis:

- Geological Assessment, which is more or less like the classification as per ISP adopted by GSI and other agencies in India.
- The process of geological assessment is generally conducted in stages of increasing details.
- The typical successive stages of geological investigation i. **reconnaissance, prospecting, general exploration and detailed exploration, generate resource data with clearly defined degrees of geological assurance.**
- The mineral extraction process **typically begins with the G4 stage.**
- These four stages are therefore used as geological assessment categories in the classification.
- The **geological assessment has 4 codes** i.e.
 - **Detailed Exploration (G1)**
 - **General Exploration (G3)**
 - **Preliminary Exploration (G3)**
 - **Reconnaissance (G4)**
- The **G3 stage is further categorised into a six-step process** to extract Lithium from Salt-flat brines or Mineral ores.
 - **Stage 1:** Geological Surveys: Mapping on a more extensive scale and linking prepared maps with a top grid. Assessment of lithology, structure, surface mineralisation, analysis of old workings etc.
 - **Stage 2:** Perform Geochemical sampling rock type wise, soil survey.
 - **Stage 3:** Detailed ground geophysical work and borehole logging.
 - **Stage 4:** Check the technicality of pits/trench to explore the mineralised zone and drill borehole spacing
 - **Stage 5:** Sampling for litho geochemical from a well-known section, pit/trench and core sample
 - **Stage 6:** Petrographic and mineralogical studies: the combined study of rocks in thin sections and the chemistry, crystal structure and physical properties of the mineral constituents of rocks.
- According to the **Indian Bureau of Mines (IBM)**, apart from the thorough examination of the above-mentioned geological axis, the proposal to mine minerals **also needs to be assessed from a feasibility point of view along with the prospects of economic viability.**

18. Geo-Strategic importance of J&K's lithium reserves

Section: Economic Geography

Concept:

- **China** at present **controls over 77% of the global lithium-ion battery** manufacturing capacity and is home to six of the world's 10 manufacturing companies.
- To overcome this challenge, countries such as the U.S., Canada, India, and the EU countries are undertaking efforts to leverage alternative supplies that can challenge China's geopolitical dominance.
- Dependencies on **critical mineral resources** are still a **major geostrategic concern** in the **transition to net-zero carbon energy systems.**
- A high level of **reliance on China for lithium and other critical resources** poses significant **energy security risks for India.**

Geo strategic Implications of the discovery

- The J&K region has historically been a site of cross-border tensions between India and Pakistan. The region has also been affected due to domestic insurgency and terrorism.
- Further, there are concerns about the risk of a socio-environmental conflict if the local populations are not engaged in the lithium extraction project.

Critical Minerals

- Critical minerals are **elements that are the building blocks of essential modern-day technologies** and are **at risk of supply chain disruptions.**
- These minerals are **now used everywhere** from making mobile phones, computers to batteries, electric vehicles and green technologies like solar panels and wind turbines.

Major Critical Minerals:

- It mostly includes **graphite, lithium, cobalt, rare earths and silicon** which is a key mineral for making computer chips, solar panels and batteries.
- **Graphite, Lithium and Cobalt** are used for making EV batteries.
- Aerospace, communications and defence industries also rely on several such minerals as they are used in manufacturing fighter jets, drones, radio sets and other critical equipment.
- While Cobalt, Nickel and Lithium are required for batteries used in electric vehicles, **rare earth minerals are critical, in trace amounts, in the semiconductors and high-end electronics manufacturing.**

Significance:

- As countries around the world scale up their transition towards clean energy and digital economy, these critical resources are key to the ecosystem that fuels this change.
- Any supply shock can severely imperil the economy and strategic autonomy of a country over-dependent on others to procure critical minerals.

Rare Earth Metals

- They are a **set of seventeen metallic elements**. These include the **fifteen lanthanides on the periodic table in addition to scandium and yttrium** that show similar physical and chemical properties to the lanthanides.
- The **17 Rare Earths** are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- These minerals have **unique magnetic, luminescent, and electrochemical properties** and thus are used in many modern technologies, including consumer electronics, computers and networks, communications, health care, national defense, clean energy technologies etc.
- Even futuristic technologies need these REEs.
- For example, high-temperature superconductivity, safe storage and transport of hydrogen for a post-hydrocarbon economy etc.
- They are called 'rare earth' because **earlier it was difficult to extract them from their oxides forms technologically.**
- They **occur in many minerals but typically in low concentrations** to be refined in an economical manner.

Rare earth in India

- Rare earth comprises seventeen elements and are classified as **light RE elements (LREE) and heavy RE elements (HREE).**
- **Some RE are available in India** such as **Lanthanum, Cerium, Neodymium, Praseodymium and Samarium**, while others such as **Dysprosium, Terbium, Europium** that are classified as HREE are **not available** in Indian deposits in extractable quantity.
- India would require supply support for such elements.

19. Sea level rise and Global Security Challenges

Section: Physical geography – Climate

Context: The rise in sea levels and its implications for international peace and security was **debated for the first time at the United Nations Security Council** February 14, 2023. However, **India, along with Russia and Brazil, pointed out the Council was not the place to address climate change.**

More on the News:

- **Sea-level rise (SLR) has doubled** since 1993, according to State of the Global Climate in 2022 report by the UN agency World Meteorological Organization. It is a direct negative effect of climate change and **creates global problems and, therefore, requires global solutions.**
- SLR unleashes both **sudden and gradual threats to the existence**, identity and security of people and nations.
- Submerged coastlines will threaten critical infrastructure, precipitate resource disputes and further marginalise the most vulnerable.
- Over 70 leaders at the meeting argued that climate change should be addressed as part of the Council's efforts **to prevent conflict, sustain peace and build resilience** in conflict-affected or otherwise fragile states.
- India, Russia and Brazil, however, stated that the **Council is not an appropriate forum** for such a discussion. The UNSC is an **unrepresentative body** that may not be the right platform to discuss climate change **as it could further polarise the debate by promoting interventionist measures** that disregard equity concerns.
- The United Nations Framework Convention on Climate Change (UNFCCC) process is the **most equitable architecture to address the issue.**
- A more **nuanced approach towards security implications** of climate change in light of growing climate vulnerabilities is required for long-term peace and security.

Rising Sea level in India and threat to coastal areas

- States such as Gujarat, Tamil Nadu and West Bengal have been witnessing rapid coastal erosion and face greater risk.

- The Global Mean Sea Level (GMSL) reached a new record high in 2021, increasing at an average 4.5 mm per year over the period 2013 -2021.
- This is more than double the rate at which sea levels rose between 1993 and 2002.
- GMSL integrates changes occurring in many components of the climate system, these include ocean warming via thermal expansion of seawater, melting of land ice and exchange of water with water bodies on land.

Rise not uniform

- Although the sea level has risen almost everywhere since 1993, it has not risen equally everywhere.
- Several regions continue to be affected by a rate of sea-level rise substantially faster than the global mean which shows the difference between local and global sea levels.
- This is particularly the case in the western Tropical Pacific, the Southwest Pacific, the North Pacific, the South-west Indian Ocean and the South Atlantic.

Affect on Indian coasts

- National Centre for Coastal Research (NCCR), Chennai under Ministry of Earth science is monitoring shoreline erosion since 1990 using remote sensing data and GIS mapping techniques.
- The approximately 6,907.18 km long Indian coastline of the mainland has been inspected from 1990 to 2018, and it has been noted that about 34 percent of the coastline is facing erosion in varying degrees.
- West Bengal has reported the highest 60.5 percent erosion followed by Puducherry (56.2 percent).
- The 15th Finance Commission has suggested that the National Disaster Management Authority and or Ministry of Home Affairs develop suitable norms as mitigation measures to prevent erosion, and that the Union and States develop a policy to deal with the extensive displacement of people due to coastal and river erosion.

About UNSC:

- The Security Council was **established by the UN Charter in 1945**. It is one of the six principal organs of the United Nations.
- The other 5 organs of the United Nations are—the General Assembly, the Trusteeship Council, the Economic and Social Council, the International Court of Justice, and the Secretariat.
- Its primary responsibility is to work to maintain international peace and security.
- **The council has 15 members: the five permanent members and 10 non-permanent members elected for two-year term**
- The five permanent members are the United States, the Russian Federation, France, China and the United Kingdom.
- **Each member of the Security Council has one vote.** Decisions of the Security Council on matters are made by an affirmative vote of nine members including the concurring votes of the permanent members.
- A “No” vote from one of the five permanent members blocks the passage of the resolution.
- Any member of the United Nations which is not a member of the Security Council may participate, without vote, in the discussion of any question brought before the Security Council whenever the latter considers that the interests of that member are specially affected.
- The council’s presidency is a capacity that rotates every month among its 15 members.
- The council is **headquartered at New York**.

20. El Nino and India

Section: Physical geography

Context: India should brace for dry and hot spring-summer, El Nino, say experts.

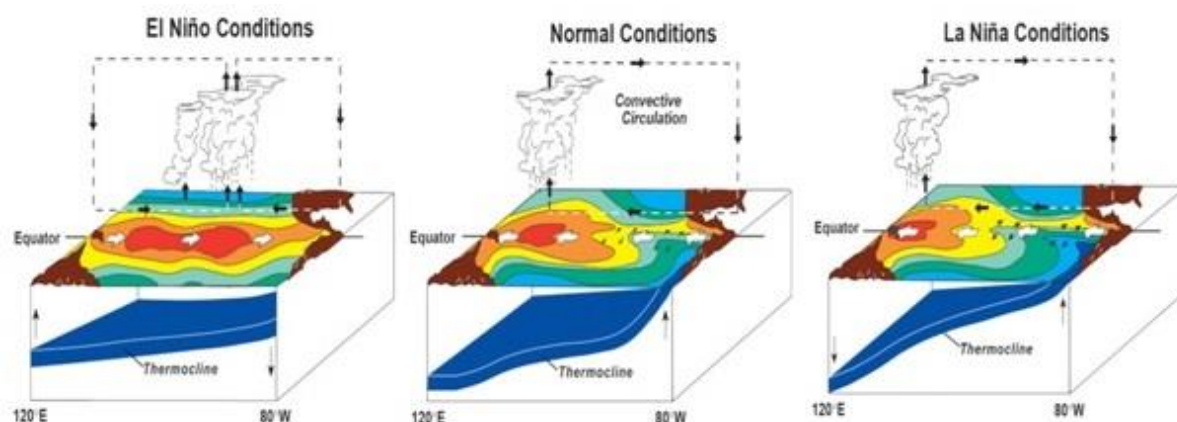
More on the News:

- Very little rainfall and warmer-than-normal temperatures projected for February as well as a declining La Niña indicate a hot and dry spring and summer months for most of India.
- United States Global Forecasting System data showed a **spike in maximum temperatures in the northwest and some parts of central, eastern and southern India** starting from February 17, 2023.
- The reason for this sudden spike in temperatures is
 - a **strong upper level westerly jet** that seems to be setting up lower-level winds that are sweeping in warm ocean and desert winds.
 - **The high-pressure region** is causing **subsidence of air** as well as enhancing the **influx of dry winds** from the northwest into India.
- During spring and summer seasons, there are concerns regarding the **decline of the La Niña conditions** by March-April and the **development of El Niño conditions** later in the year, which **could mean further rise in temperatures and subsequent heat waves**.
- Forecasting model of the United Kingdom Met Agency about the **5°C barrier being temporarily breached** for the average temperature anomaly for 2024 due to the prospective El Niño.

More about El Nino:

The ENSO cycle-

- **El Niño** is characterised by **warmer-than-average waters** in the **central and eastern tropical Pacific** and a **slowdown of trade winds** (which blow east to west), and **La Niña** by **cooler-than-average waters** and **intensified trade winds**.
- A **neutral phase** emerges when conditions are neither warm nor cool.
- **El Niño, La Niña** and **neutral phases** are a part of **ENSO**, climate phenomena that alter atmospheric circulation.
- This impacts temperature and precipitation across the globe.



El Nino impacts on India:

- In a normal monsoon year (without El Nino), the pressure distribution is as follows:
- The coast of Peru in South America has a higher pressure than the region near northern Australia and South East Asia.
- The Indian Ocean is warmer than the adjoining oceans and so, has relatively lower pressure. Hence, moisture-laden winds move from near the western Pacific to the Indian Ocean.
- The pressure on the landmass of India is lower than on the Indian Ocean, and so, the moisture-laden winds move further from the ocean to the lands.
- If this normal pressure distribution is affected for some reason, the monsoons are affected.
- El Nino means lesser than average rains for India. Indian agriculture is heavily dependent on the monsoons and because of this, lesser rainfall during the monsoons generally translates to below-average crop yields.

Triple-dip La-Niña-

- A “triple-dip” La Niña is a **multiyear cooling of the surface temperature** of the equatorial Pacific Ocean, which can cause droughts, fierce winds and heavy rainfall.
- According to **WMO**, the **current La Niña** is projected to **span three consecutive northern hemisphere winters**.
- Since **1950**, the **Earth** has witnessed a **triple La Niña thrice**, including the **current one**.
- A **La Niña phase four years in a row** has not been recorded so far.

Possible Consequence of El Nino :<https://optimizeias.com/four-possible-consequences-of-el-nino-returning-in-2023/>

21. Second aubrite meteorite found in India in 170 years – Diyodar meteorite

Section: Physical Geography (Geomorphology)

Concept :

- On August 17, 2022, a meteorite streaked over India, breaking apart as it descended through the air, to scatter over two villages in Banaskantha, Gujarat.
- The **meteorite** is a “**rare, unique specimen**” of **aubrite**, analysis by a group of scientists at the **Physical Research Laboratory (PRL)**, **Ahmedabad**, has revealed.
- India has been the site of hundreds of meteorite crashes **but this is only the 2nd recorded aubrite crash**. The past was in 1852 in Basti, Uttar Pradesh.

Diyodar Meteorite

- **Aubrite meteorite** is a **coarse-grained igneous rock** that **formed in oxygen-poor conditions** and contains **exotic minerals not found on Earth**.
- For example, the **mineral heideite** was first described in the **Basti meteorite**.
- The meteorite has been **named the Diyodar meteorite** after the taluka in which the villages are located.
- Around **90% of the Diyodar meteorite** was **composed of orthopyroxene**.
- Aubrites are typically **light-colored with a brownish fusion crust**. Most aubrites are **heavily brecciated**; they are **often said to look “lunar” in origin**.

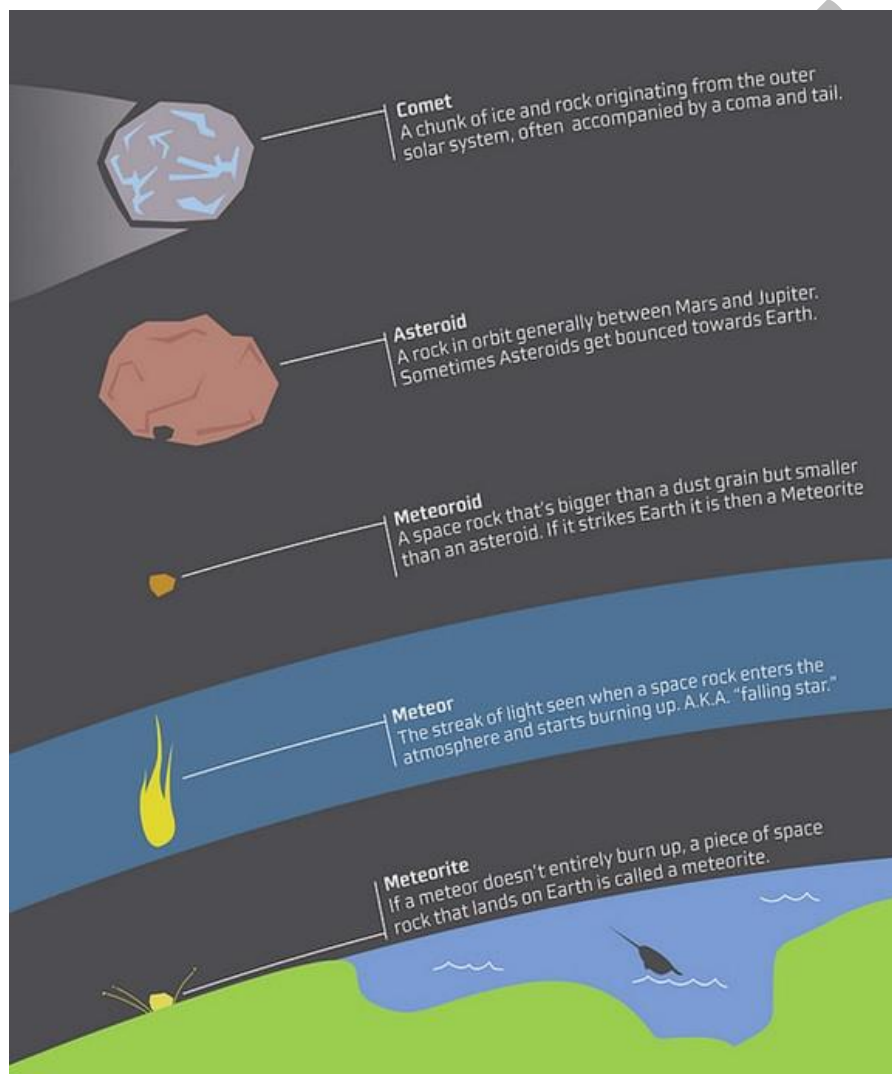
- Aubrites are **primarily composed of large white crystals of the Fe-poor, Mg-rich orthopyroxene, or enstatite**, with minor phases of olivine, nickel-iron metal, and troilite, indicating a magmatic formation under extremely reducing conditions.
- **Source of origin:** Scientists are not yet sure of their origin, but some signs indicate that they could be from the asteroid 3103 Eger or from the planet Mercury.

Pyroxenes

- **Pyroxenes are silicates consisting of single chains of silica tetrahedra (SiO_4); orthopyroxenes are pyroxenes with a certain structure.**
- Pyroxenes such as diopside and jadeite have been used as gems. Spodumene was historically used as lithium ore. Rocks with pyroxene have also been used to make crushed stone that is used in construction.
- Aubrites have crashed in at least 12 locations worldwide since 1836, including 3 in Africa and 6 in the U.S.

Meteorite

- A meteorite is a **solid piece of debris from space that survives its passage through the Earth's atmosphere and lands on the Earth's surface.**
- **Difference between Meteor, Meteorite and Meteoroid:**
- The difference between a meteor, meteorite and meteoroid is nothing but **where the object is.**
- **Meteoroids are objects in space that range in size from dust grains to small asteroids.**
- But when **meteoroids enter the Earth's atmosphere**, they are **called meteors.**
- But if a meteoroid **enters the Earth's atmosphere and hits the ground**, it is called a **meteorite.**



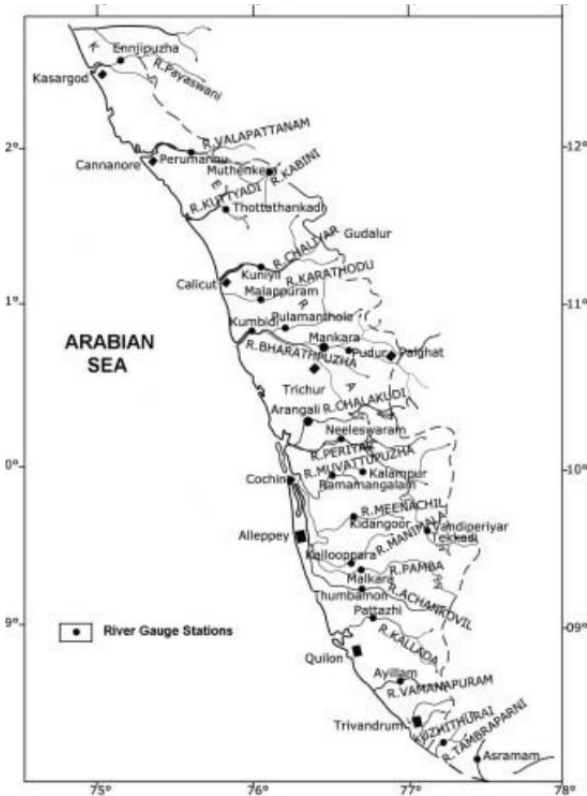
22. Central Travancore stares at drought as water level begins a drastic drop

Section: Indian Physical Geography

Context: The Irrigation department is planning to construct bunds at select points across the Meenachil ahead of the scheduled opening of the Thanneermukkam bund on March 15.

More on the News:

- Central Travancore is **enduring a searing summer** this time with the **water level in all major rivers across the region recording a drastic fall.**
- According to officials with the Irrigation department, **water level in the Meenachil, Manimala, and the Pampa**—which together feed most part of the region—**have fallen drastically** over the past couple of weeks.
- The level at the intake points of various water bodies, is sufficient to meet the requirements for the various drinking water projects for the time being though the situation is **expected to deteriorate with the rise in temperature.**
- Meanwhile, the **high-lying areas** in the eastern side are **staring at a severe drought condition** with the water level in Manimalayar river already hitting the bottom.
- The phenomenon, in turn, also has a **significant impact on the ground water levels** of the region.



- More than half of those who could be impacted live in four countries: **India, Pakistan, Peru, and China.**
- **Glacial lake outburst floods (GLOFs)** are a type of flood that occurs when a glacial lake or a dam containing the lake fails.

Important Findings of the study

- This study estimates that 15 million people live within the 50 km danger zone of glacial lakes.
- It adds that populations in **High Mountains Asia (HMA)** — a **region stretching from the Hindu Kush all the way to the eastern Himalayas** — are the **most exposed** and on average live closest to glacial lakes with around one million people living within 10 km of a glacial lake.
- Another interesting finding of the study is that the glacial flood risks don't only depend on the size and number of glacial lakes in an area. What also matters is the number of people living in the area, their proximity to the danger zone as well as the levels of social vulnerability.

Glacial lake outburst floods (GLOFs)

- A glacial lake outburst flood is a type of **catastrophic flood that occurs when the dam containing a glacial lake fails, releasing a large volume of water.**
- This type of flood is typically caused by **rapid melting of glaciers or the buildup of water in the lake due to heavy precipitation or the inflow of meltwater.**
- In February 2021, Chamoli district in Uttarakhand witnessed flash floods which are suspected to have been caused by GLOFs.

Causes:

- These floods can be triggered by a number of factors, including changes in the volume of the glacier, changes in the water level of the lake, and earthquakes.
- According to NDMA (National Disaster Management Authority), glacial retreat due to climate change occurring in most parts of the Hindu Kush Himalayas has given rise to the formation of numerous new glacial lakes, which are the major cause of GLOFs.

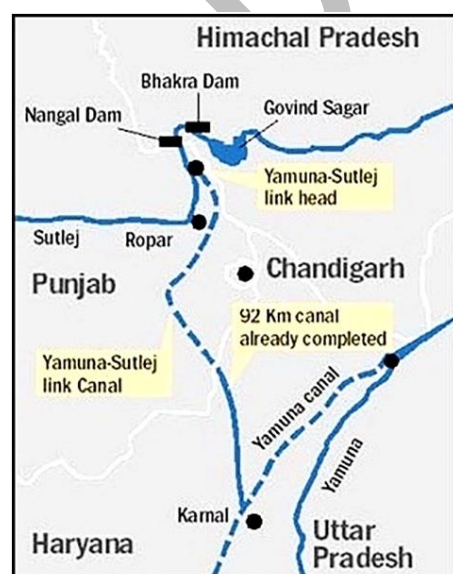
25. Haryana committed to construct Satluj-yamuna link canal says governor

Concept:

- The Haryana Governor said the State government is committed to constructing the Sutlej-Yamuna Link (SYL) canal in order to get the State's share of waters in the Ravi and the Beas rivers. The SYL canal is a focal point of a water-sharing dispute between Haryana and Punjab.

Sutlej-Yamuna Link (SYL) canal

- The canal, once completed, will enable sharing of the **waters of the rivers Ravi and Beas between Haryana and Punjab.**
- Haryana will get its share of Ravi and Beas waters by diverting equal amount of Sutlej water towards Haryana.
- The Satluj Yamuna Link Canal is a **proposed 214-kilometre-long canal connecting Sutlej and Yamuna rivers.**
- It is a 214-km canal, **122 km of which was to run through Punjab** and the **rest through Haryana.**
- **Haryana has completed its side of the canal, but work in Punjab has been hanging fire** for over three decades.
- Water resources are under the State List, while the Parliament has the power to make laws regarding inter-state rivers under the Union List.



Key Highlights about Sutlej and Yamuna River

Sutlej:

- The ancient name of Sutlej River is Zaradros (Ancient Greek) Shutudri or Shatadru (Sanskrit).
- It is the **longest of the five tributaries of the Indus River** that give the Punjab (meaning “Five Rivers”) its name.
- **Jhelum, Chenab, Ravi, Beas and Satluj are main tributaries of Indus.**
- **It rises on the north slope of the Himalayas** in Lake La’nga in **southwestern Tibet.**
- Flowing northwestward and then west-southwestward through Himalayan gorges, it enters and crosses Himachal Pradesh before beginning its flow through the Punjab plain near Nangal.
- Continuing southwestward in a broad channel, it **receives the Beas River** (and forms 65 miles of the India-Pakistan border before entering Pakistan and flowing another 220 miles to **join the Chenab River west of Bahawalpur.**
- **Sutlej River meets the Beas River in Harike** in the Ferozpur district before entering Pakistan.
- The combined rivers then form the Panjnad, the link between the Five Rivers and the Indus.
- **Luhri Stage-I Hydro Electric Project** is located on **River Satluj** in Shimla and Kullu districts of Himachal Pradesh.

Yamuna:

- The river **Yamuna, a major tributary of river Ganges, originates from the Yamunotri glacier** near Bandarpooch peaks in the **Mussoorie range of the lower Himalayas** at an elevation of about 6387 meters above mean sea level in Uttarkashi district of Uttarakhand.
- It meets the **Ganges at the Sangam (where Kumbh mela is held) in Prayagraj**, Uttar Pradesh after flowing through Uttarakhand, Himachal Pradesh, Haryana and Delhi.
- **Length: 1376 km**
- **Important Dam:** Lakhwar-Vyasi Dam (Uttarakhand), Tajewala Barrage Dam (Haryana) etc.
- **Important Tributaries:** Chambal, Sindh, Betwa and Ken (Right bank).

26. El Nino and La Nina

Section: Physical Geography (Climatology)

Concept :

- India is **currently witnessing a colder than normal winter** mainly **due to the north-south winter flow** because of the **climate phenomenon known as La Niña.**
- The **equatorial Pacific Ocean is experiencing the longest-ever La Niña episode** in recorded history.
- Having started in September 2020, it has prevailed for three consecutive years and thus has been classified as a **“triple dip La Nina”.**
- **However, the forecasts for the 2023 fall and winter are predicting that there is a 50% possibility for the occurrence of El Niño.**
- In the Indian context, **La Niña is associated with good monsoon rainfall, while El Niño is expected to suppress monsoon rainfall.**

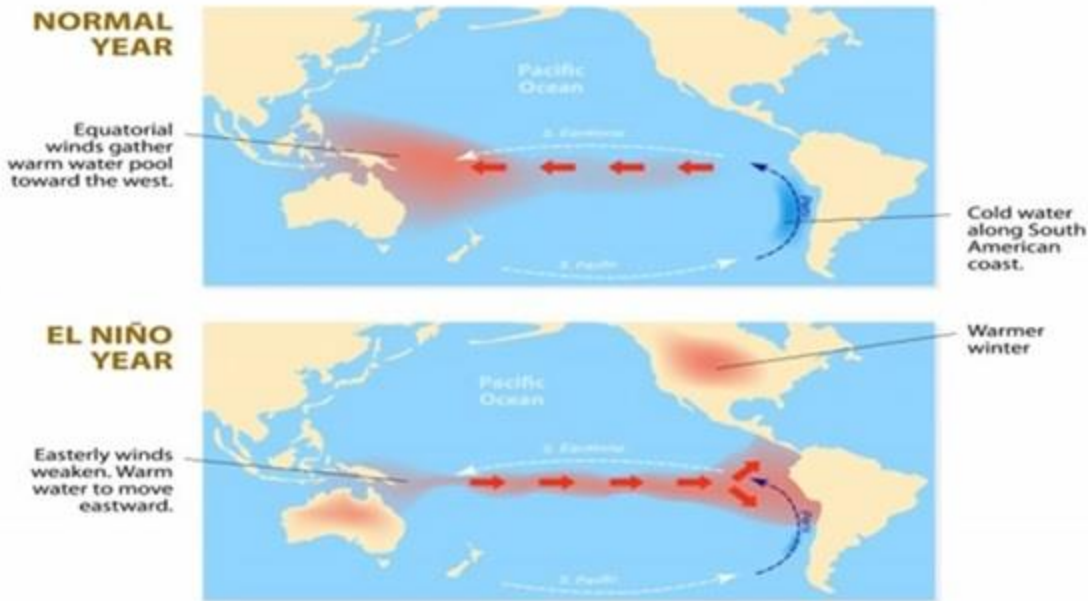
El Nino

- **El Nino** refers to the **large-scale ocean-atmosphere climate interaction** linked to periodic **warming in sea surface temperatures** across the **central and east-central Equatorial Pacific.**
- It is **associated with high pressure in the western Pacific.** El Nino adversely impacts the Indian monsoons and hence, agriculture in India.
- **El Nino impacts on India:**
- In a normal monsoon year (without El Nino), the pressure distribution is as follows:
- The coast of Peru in South America has a higher pressure than the region near northern Australia and South East Asia.
- The Indian Ocean is warmer than the adjoining oceans and so, has relatively lower pressure. Hence, moisture-laden winds move from near the western Pacific to the Indian Ocean.
- The pressure on the landmass of India is lower than on the Indian Ocean, and so, the moisture-laden winds move further from the ocean to the lands.
- If this normal pressure distribution is affected for some reason, the monsoons are affected.
- El Nino means **lesser than average rains for India.** Indian agriculture is heavily dependent on the monsoons and because of this, lesser rainfall during the monsoons generally translates to below-average crop yields.

What happens because of El Nino?

- The **cool surface water off the Peruvian coast goes warm because of El Nino.** When the water is warm, the **normal trade winds get lost or reverse their direction.**
- Hence, the **flow of moisture-laden winds is directed towards the coast of Peru** from the **western Pacific** (the region near northern Australia and South East Asia).
- This causes **heavy rains in Peru** during the El Nino years robbing **the Indian subcontinent of its normal monsoon rains.** The larger the temperature and pressure difference, the larger the rainfall shortage in India.

THE EL NIÑO PHENOMENON

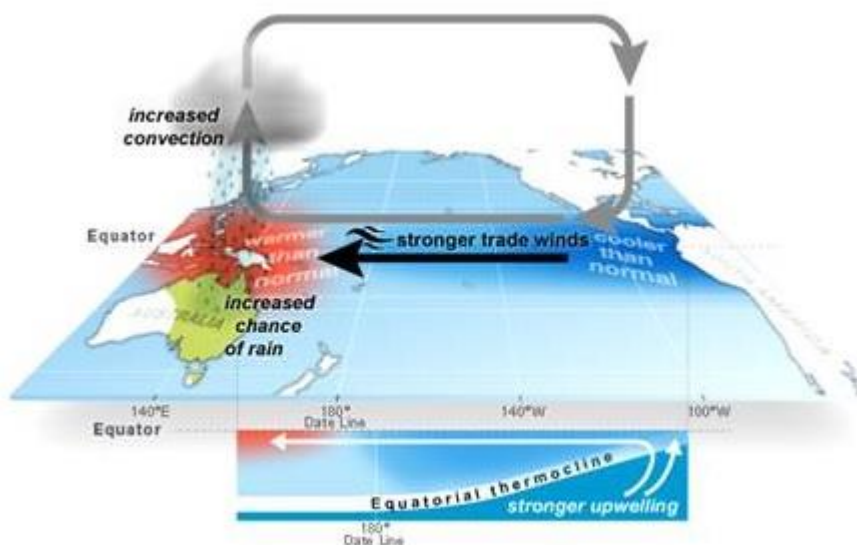


About La Nina:

- It means the **large-scale cooling of ocean surface temperatures in the central and eastern equatorial Pacific Ocean**, together with changes in the tropical atmospheric circulation, namely winds, pressure and rainfall.
- It has the **opposite impacts on weather and climate as El Niño**, which is the warm phase of the El Niño Southern Oscillation (ENSO).

Weather Changes due to La Nina :

- The **Horn of Africa and central Asia** will see **below average rainfall due to La Niña**.
- East Africa is forecast to see drier-than-usual conditions, which together with the existing impacts of the desert locust invasion, may add to regional food insecurity.
- It could also lead to **increased rainfall in southern Africa**.
- It could also affect the **South West Indian Ocean Tropical Cyclone season**, reducing the intensity.
- Southeast Asia, some Pacific Islands and the northern region of South America are expected to receive above-average rainfall.
- In **India, La Niña means the country will receive more rainfall than normal**, leading to floods.



El Niño–Southern Oscillation (ENSO): **La Niña**

ENSO Cycle

- **El Nino–Southern Oscillation (ENSO)** is an **irregularly periodic variation** in winds and sea surface temperatures over the **tropical eastern Pacific Ocean**.
- Every three to seven years, the surface waters across tropical Pacific Ocean warm or cool by 1°C to 3°C, compared to normal.
- The **warming phase of the sea temperature is known as El Nino and the cooling phase as La Nina**.
- Thus, El Nino and La Nina are opposite phases of what is known as the El Nino-Southern Oscillation (ENSO) cycle.
- These deviations from normal surface temperatures can have large-scale impacts not only on ocean processes, but also on global weather and climate.

27. Unusual February heat, and the ‘normal abnormal’ in global weather

Section: PHYSICAL Geography (climatology)

Concept:

- It is still February, technically a winter month, and temperatures in some parts of the country are touching 40 degrees Celsius. There are already concerns over the possibility of an intensely hot summer and extended heat waves this year.
- However, the current spell of abnormally high temperatures, mainly in northern and western India, is no indicator of how hot the summer, or the rest of the year will be.

India IMD Weather Forecast:

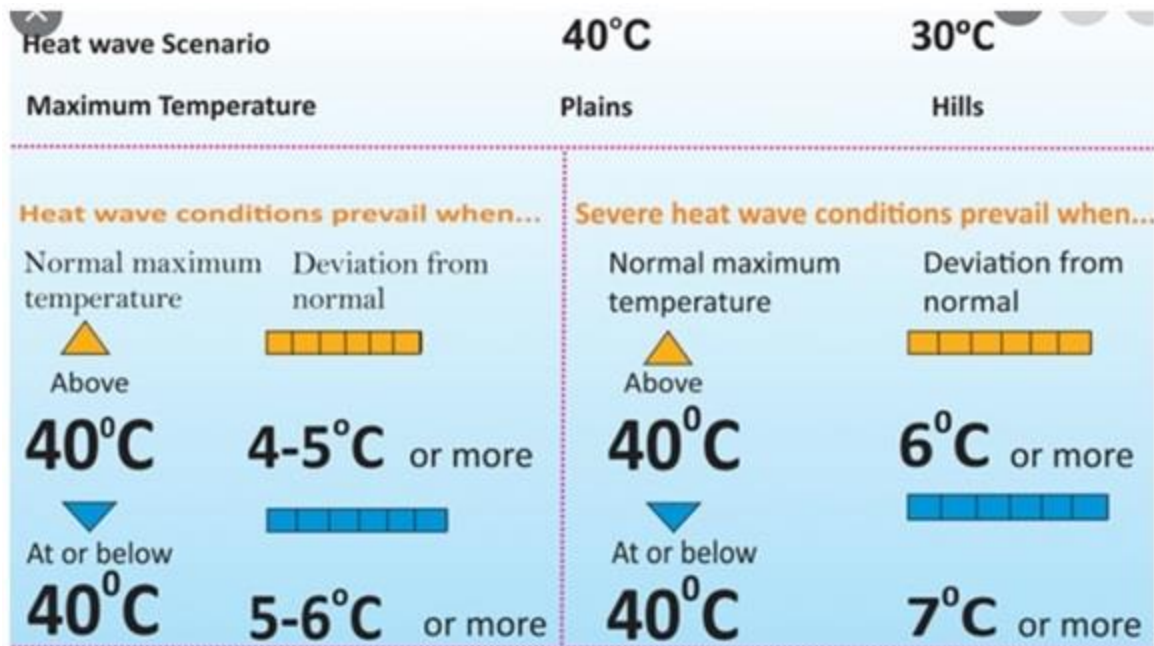
- The maximum temperature in February, averaged over the country as a whole, is expected to be around 28 degrees C based on the record of the 30-year period from 1981 to 2010. This is taken to be the “normal”. The minimum temperature is expected to be around 15 degrees C.
- However in the past week, maximum temperatures have been 5-11 degrees C higher than normal in most parts of northern and western India.
- These abnormal high temperatures are **qualified to be described as ‘heat waves’**.
- However, **heat wave declarations by the IMD**, which trigger follow-up action by the local administration, are **meant only for the April-July period, not for February or March**.

Possible Reasons

- The IMD has attributed the current spell of hot weather to a combination of factors, including the **absence of western disturbance activity in February**, which brings some rainfall in this month and keeps temperatures down.
- Until now, less than a sixth of the country has recorded normal or excess rainfall for February.
- The IMD has said that the plains have been relatively dry, and rainfall or snowfall in the hills has been subdued.
- According to the IMD, an **anticyclonic formation over south Gujarat is one of the main reasons for the warming on the west coast**. Its effect was being transmitted northward to Rajasthan, Punjab, Delhi, Himachal Pradesh, and western Uttar Pradesh.
- **At the global level**, this year is **widely expected to be a little hotter than the previous two years**, mainly **because of the expected end of the strongest ever La Niña event**.
- **The cushion against warming provided by the La Niña is projected to go in the next couple of months, raising fears that this year could set new warming records**.

What are heat waves?

- A **Heat Wave is a period of abnormally high temperatures**, more than the normal maximum temperature that occurs **during the summer season in the North-Western parts of India**.
- Heat Waves **typically occur between March and June, and in some rare cases even extend till July**.
- The extreme temperatures and resultant atmospheric conditions adversely affect people living in these regions as they cause physiological stress, sometimes resulting in death.
- The **Indian Meteorological Department (IMD) has given the following criteria** for Heat Waves :
- Heat Wave need not be considered till **maximum temperature of a station reaches atleast 40°C for Plains and atleast 30°C for Hilly regions**.
- When normal maximum temperature of a station is less than or equal to 40°C .
- Heat Wave **Departure from normal is 5°C to 6°C and Severe Heat Wave Departure from normal is 7°C or more**
- When **actual maximum temperature remains 45°C or more irrespective of normal maximum temperature**, heat waves should be declared.
- Higher daily peak temperatures and longer, more intense heat waves are becoming increasingly frequent globally due to climate change.
- India too is feeling the impact of climate change in terms of increased instances of heat waves which are more intense in nature with each passing year, and have a devastating impact on human health thereby increasing the number of heat wave casualties.



28. New policy to help Indian communities displaced by annual river & coastal erosion drafted

Section: Indian Physical Geography

Context: National Disaster Management Authority (NDMA) is drafting India's first national policy for the mitigation and rehabilitation of the people affected by river and coastal erosion.

About the draft policy:

- The **Union Ministry of Home Affairs** had directed **NDMA** to draft a policy based on the **15th Finance Commission's report for 2021**, in which it had for the first time emphasised on rehabilitation and resettlement for people displaced by the river and coastal erosion, in view of the increasing threat due to climate change.
- Until now, most policies in the country only address displacement after sudden rapid-onset disasters such as floods and cyclones.

Key features include:

- The **15th Finance Commission's report** considers two aspects related to the new policy.
 - First**, it introduces mitigation measures to prevent erosion under the **National Disaster Mitigation Fund (NDMF)**, with an allocation of **Rs 1,500 crore** for **2021-26**.
 - Second**, for the resettlement of displaced people affected by erosion, it allocates **Rs 1,000 crore** for the same period under the **National Disaster Relief Fund (NDRF)**.
- This is being taken out of the recovery and reconstruction window introduced for the first time under NDRF in 2021.
- NDMA** will coordinate the allocations and expenses under **NDRF** and **NDMF** at the national level for mitigation and rehabilitation.
- District disaster management authorities** would be the nodal agency to implement the measures, aided by other district agencies and a specific panchayat-level committee.
 - The **DDMA** will prepare **mitigation and rehabilitation plans** and **submit** them to the **SDMAs**, from where the proposed measures will be appraised by **NDMA** and finally submitted to the home ministry.
 - A **high-level committee of the ministry** will then approve the disbursal of funds.
 - DDMAs** will also be responsible for **organising, monitoring and evaluation of the efforts** under the supervision of their state and national counterparts.
- Detailed hazard assessments** carried out by central agencies such as the National Centre for Coast Research, National Centre for Sustainable Coastal Management, Central Water Commission and, high-resolution LiDAR data available with National Remote Sensing Centre should be made available to the **SDMAs**.
 - These should be made available in easy-to-access in **geographic information systems (GIS) formats** by the **NDMA**.
- The policy insists on mapping coastal and river erosion impacts and coming up with a database of diverse challenges confronted by the affected and vulnerable habitations.
- The draft policy also recommends **impact and vulnerability assessments of regions threatened by coastal and river erosion** to be undertaken periodically, which will be spearheaded by **SDMAs** in coordination with the state departments and **DDMAs**.

29. Reviving Adi Ganga: Central funds, international project give hope

Section: Indian Physical Geography

Context:

- The **National Mission for Clean Ganga** has allotted around **Rs 650 crore** to revive the ancient river, the **Adi Ganga** (the original channel of River Ganga passing through the city of Kolkata), and it has also been included in a **multi-country river project** on combating pollution.

More on the news:

- The developments come after the **National Green Tribunal** had directed the **West Bengal** government to complete its rejuvenation by 2025.
- The panelists at an **international water conference** organised in **Sylhet, Bangladesh** by the **non-profit Action Aid** decided to explore the possibility of a pan-south Asian project to address the pollution of one key river each in India, Bangladesh, Nepal, China and Malaysia. **Adi Ganga** was selected from India.
- Apart from **Adi Ganga**, **Buriganga** in Bangladesh, **Puyang** in China, **Bagmati** in Nepal and **Klang** in Malaysia were also chosen for pollution study

About the river: Adi Ganga

- **Adi Ganga** (also known as the **Gobindapur Creek** and **Tolly's Canal**), is a stream that was part of the **Hooghly River** in the Kolkata area of India.
- **Adi Ganga** was the **river's main channel** till the **17th century**.
 - Source of the river- **Sundarbans**
 - Around **1750**, a canal was dug to connect the main course of the river with the lower part of **River Saraswati** adjacent to
 - The resultant **Hooghly** became the **main river stretch** and **Adi Ganga** turned into a secondary tributary.
- However, **Adi Ganga** continued to thrive till the **1970s**. Since then, its water quality gradually deteriorated until it turned into a sewer and got rapidly encroached, even fully filled up just beyond the boundary of the city's municipal corporation.
- Also the **choking of Adi Ganga** severely impacted the natural drainage of the area.
- According to the **state pollution control board data** the dissolved oxygen is zero for **Adi Ganga** river.
- After crossing the Kolkata city, the river vanishes into the concrete houses, halls and roads.

Efforts to clean the river:

- In **1998** the **Calcutta High Court** directed removal of all encroachments within a month, but a report, came after two decade of the order, showed that the encroachments were still existing.
- The **expansion of the Metro Rail in 2009** from the Tollygunge tram depot to Garia in the southern part of the city accentuated the situation as 300 pillars supporting the rails were being anchored at the middle of the channel.

30. Venice's famous canals are now drying

Section: Places in news

Concept :

- A high-pressure system is stuck over Venice, **creating low tides, which has led to low water levels and dry canals**.
- However, experts suggest the root cause behind the issue is the **drought-like situation across Italy**.
- Apart from this, tourists have also been left disappointed as **gondolas, the flat-bottom long boats that travel under the famous bridges of Venice**, can't navigate the dried-up routes.
- **Note : In 2019**, the city of Venice was flooded due to high tides.

Acqua alta

- **Acqua alta** is the name given to **exceptionally high tides in the Adriatic Sea**.
- **Late autumn and winter** are the seasons for **high tides** or **acqua alta in Venice**.
- The phenomenon occurs mainly between autumn and spring, when the astronomical tides are reinforced by the prevailing seasonal winds that hamper the usual reflux.
- The main local winds involved are **the sirocco and the Bora**.

City of Venice

- Located in northern Italy, the city of Venice has a unique geography.
- It is a **collection of over 118 small islands spread over a lagoon**, which is a kind of water body that is separated from a larger water body through some kind of land formation.
- Covering 70,176.4 ha., the **Venetian lagoon is separated from the Adriatic Sea**.
- The **islands are located in the shallow Venetian Lagoon**, an enclosed bay that lies between the **mouths of the Po and the Piave rivers**.
- The lagoon and a part of the city are **listed as a UNESCO World Heritage Site**.
- Venice has been known as "La Dominante", "La Serenissima", "Queen of the Adriatic", "City of Water", "City of Masks", "City of Bridges", "The Floating City", and "City of Canals".

Water Crisis in Italy

- Since last summer, the region has been seeing a severe shortage of water in its rivers and lakes.
- Italian Alps have received nearly half of the normal snowfall during this winter. This is worrying as snow is an important source of water in spring and summer when, by melting, it ensures water supplies in the months it is most needed.
- Meanwhile, **Italy's longest river, the Po**, which travels from **the Alps to the Adriatic**, has 61 per cent less water than normal at this time of year.
- To make matters worse, **Italy's largest lake, Lake Garda**, is also suffering from low water levels.



31. First ever lithium mines auction likely by June

Section: Economic Geography

Context: India plans to auction blocks of lithium mines, recently discovered in Jammu and Kashmir, between April and June, a mines ministry official said

Concept:

- India had recently declared that it has established “**lithium inferred resources**” calculated on the basis of physical and chemical study of the surface and samples along the **SalalHaimana area of Reasi district in Jammu & Kashmir**.

Stages of exploration (G4 TO G1) and future prospects by GSI

- The resources are estimated at 5.9 million tonnes (mt), and work is at a **preliminary exploration stage also called G3**.
- Most of the resources are in **rock formation** and those acquiring the blocks may need to put up processing plants.
- **Mapping** is considered the first step in identifying the presence of a mineral, followed by exploration's had **mapped and reported** the deposits of lithium in Jammu and Kashmir in
- India moved from **reconnaissance or mapping stage (G4) to prospecting stage (G3)** for the lithium mines. Generally conducted for smaller areas, a few kms. To tens of Sq.kms. Pitting and trenching carried out to expose the orebody if near to the surface.
- The next stage, **G2 (general exploration)** entails studies to estimate the **shape, size and grade of minerals**. length, width and depth identified based on surface studies and drilling data. Pitting, trenching and bed rock sampling on all outcrop sections.
- Ultimately, in the **G1 stage**, the characteristics of the deposit are **established with accuracy**. Exploratory openings or boreholes are drilled at closer intervals along the strike and also depth wise, to accurately determine the shape, size, disposition of ore and grade of ore body.
- As we go from G4 to G1 the size of the area being explored is reduced.
- According to mines ministry officials, there will be more “field studies in the Himalayan regions” **Uttarakhand and Himachal Pradesh** given the topographical similarities

Import dependence:

- India currently imports all the major components that go into lithium ion cell manufacturing, with the import bill estimated at around ₹16,300 crore during the April–December period this fiscal.
- China controls nearly 77 percent of lithium ion manufacturing capacities and six of the 10 major producers are based there.
- It also controls mines globally by investing in the companies that mine the metal.

32. Cyclone Freddy travelled from Australia to batter Madagascar, one of the most climate-vulnerable nations

Section: Physical geography

Context:

- Cyclone Freddy made landfall along **Madagascar's south-eastern coast**.

- **Details:**
- Madagascar was also hit by tropical storm Cheneso in January 2023.
- There were a total of six tropical weather systems (tropical storm Gombe on March 8 and tropical storm Jasmine on April 26), apart from the ITCZ, that affected Madagascar between January and April.
- Madagascar is also undergoing the worst famine in the recent history.
- The **World Food Programme (WFP)** called it the **world's first famine caused because of climate change**.

About Cyclone Freddy:

- Freddy travelled around 7,200 km from the southeast Indian Ocean to Madagascar in 15 days.
- This is the first time since 2000 that a cyclone has moved such a long distance from the south-eastern parts to the south-western parts of the Indian Ocean.
- It is highly unusual for cyclones to be sustained for such long time periods and travel such long distances.
- The storm carried winds of 130 kilometres per hour at landfall and has brought torrential rainfall for south-eastern Madagascar.
- The cyclone is now moving towards Mozambique.
- **Role of Inter-tropical convergence zone (ITCZ):**
- The rainfall started with an inter-tropical convergence zone (ITCZ) in mid-January.
- **ITCZ** is the region near the equator where the northeast and southwest trade winds converge to form a band of clouds with rainfall and occasional thunderstorms.
- The **ITCZ** gave way to **two back-to-back tropical storm systems:**
- **tropical storm Ana** in the last week of January.
- **cyclone Batsirai** in the first week of February.

Tropical cyclones:

- Tropical cyclones are violent storms that originate over oceans in tropical areas and move over to the coastal areas.
- It brings large-scale destruction caused by violent winds, very heavy rainfall and storm surges.
- The winds blow counter clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Terminology:

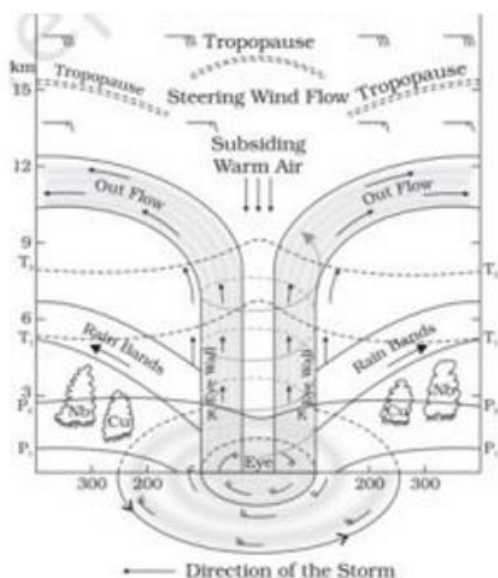
- **It varies location to location.** They are known as
 - Cyclones in the Indian Ocean
 - Hurricanes in the Atlantic
 - Typhoons in the Western Pacific and South China Sea, and,
 - Willy-willies in the Western Australia.

Conditions favorable for the formation:

- Large sea surface with temperature higher than 27° C;
- Presence of the Coriolis force;
- Small variations in the vertical wind speed;
- pre-existing weak low-pressure area or low-level-cyclonic circulation;
- Upper divergence above the sea level system.

Characteristics:

- The **energy that intensifies the storm** comes from the **condensation process** in the towering cumulonimbus clouds, surrounding the centre of the storm.
- With continuous supply of moisture from the sea, the storm is further strengthened. The more time they spend over the seas, the stronger they become.
- **On reaching the land** the moisture supply is cut off and the storm dissipates. The place where a tropical cyclone crosses the coast is called the **landfall of the cyclone**.
- The cyclones, which **cross 20° N** latitude generally, **re-curve and they are more destructive**.
- A **mature tropical cyclone** is characterized by the strong spirally circulating wind around the centre, called the eye. The diameter of the circulating system can vary between **150 and 250 km**. The eye is a region of calm with subsiding air.
- Around the **eye** is the **eye wall**, where there is a strong spiraling ascent of air to greater height reaching the tropopause. The wind reaches maximum velocity in this region, reaching as high as 250 km per hour. Torrential rain occurs here.
- From the eye wall rain bands may radiate and trains of cumulus and cumulonimbus clouds may drift into the outer region.



33. Low tides and drought: Why have Venice's famous canals gone dry?

Section: Places in News

Context: Some of Venice's iconic secondary canals have almost dried up in the past few days, rendering it impossible for water taxis, gondolas and even ambulance boats to navigate.

Details:

Experts say the reason is a prolonged spell of low tides coupled with the lack of rain.

In 2019, it witnessed the worst floods since 1966, resulting in damage worth hundreds of millions of euros.

Reason for drying up of canals:

- Weather analysts believe that a **high-pressure system is stuck over the region**, which has created **low tides**, leading to low water levels.
- However, researchers say the root cause is the **drought-like situation in Italy**, especially in its northern parts.

Water crisis in Italy:




- Italy has been seeing a severe shortage of water in its rivers and lakes.
- In 2022, Italy experienced its **worst drought in 70 years** and authorities declared a state of emergency in several northern areas.
- **Italian Alps** have received about half the normal snowfall during this winter.
- Italy's longest river, **the Po**, which travels from the **Alps** to the **Adriatic Sea**, has **61 per cent** less water than normal at this time of year.
- Its largest lake, **Lake Garda**, also has low water levels.




Worst Drought in Europe:



- After the record-breaking summer heat, **2022 was the worst drought year in Europe in 500 years**. Large rivers have been reduced to shallow streams, hitting power generation.
- Some of Europe's biggest rivers — **Rhine, Po, Loire, Danube** — which are usually formidable waterways, are unable to support even mid-sized boats.
- **Causes include:**
 - Significant deviation from normal weather patterns.
 - Prolonged heatwave
 - Unusually high temperatures have led to increased evaporation of surface water and soil moisture.
- **Impact of drought:**
 - Damage to transport and tourism sector.
 - Electricity shortages leading to increased energy prices.
 - Food has become sharply more expensive
 - Agriculture has also been affected badly




Important rivers of Europe:

River	Description	Map
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<p>Volga river</p>	<p>The Volga River is about 3,531 km in length and is the longest river on the European continent.</p> <p>The Volga is also widely considered as the National River of the Russian Federation.</p> <p>It originates in the Valdai Hills and flows through the central part of Russia to its southern part where it eventually drains into the Caspian Sea.</p> <p>The Volga River is fed by numerous tributaries, notable among which are Sura, Oka, Vetluga, and Kama.</p> <p>During Soviet rule, many hydroelectric reservoirs were built on the Volga River. Some of these reservoirs are Volgograd, Saratov, Uglich, Gorky, and Cheboksary.</p>	
<p>Dnube river</p>	<p>The Danube River has a length of about 2,850 km and is considered the second-longest river in the European continent.</p> <p>It rises at the confluence of the Brigach and Breg rivers, near the German town of Donaueschingen in the Black Forest region of Germany.</p> <p>The river flows across major portions of central and southeastern Europe, passing through the 10 European nations of Germany, Austria, Romania, Hungary, Bulgaria, Serbia, Croatia, Slovakia, Ukraine, and Moldova.</p> <p>There are many tributaries of the Danube river including Lech, Isar, Inn, Enns, Rába, Drava, Mlava, etc.</p> <p>The Danube River finally drains into the Black Sea via the Danube Delta.</p>	
<p>Dnieper River</p>	<p>The Dnieper River has a length of about 2,200 km and is the fourth-longest river in Europe.</p> <p>It originates in the Valdai Hills located near the Russian city of Smolensk.</p> <p>The river then flows in a southerly direction through the western part of the Russian Federation and the European nations of Belarus and Ukraine before draining into the Black Sea.</p>	

	<p>It has been estimated that there are more than 32,000 tributaries of the Dnieper River.</p> <p>Some of these tributaries are Berezina, Bilozerka, Drut, Desna, Prypiat, Sozh, Myareya, Samara, Sula, and Vyazma.</p>	
Don river	<p>The Don River has a length of about 1,870 km and is the fifth-longest river in Europe.</p> <p>It originates in the Russian Tula oblast near the city of Novomoskovsk.</p> <p>It then flows in a southeasterly direction towards the Volga river, but abruptly turns in the west to join the Gulf of Taganrog in the Sea of Azov.</p> <p>Some of the tributaries of the Don River include Chir, Seversky Donets, Chyornaya Kalitva, Krasivaya Mecha, Khopyor, and Medveditsa.</p> <p>The 101 km-long Lenin Volga-Don Shipping Canal links the Don River with the Volga River.</p>	
Elbe River	<p>The Elbe River has a length of about 1,112-km and originates in the southern part of the Krkonoše Mountains which is located near the boundary between Poland and the Czech Republic.</p> <p>It then flows through Bohemia in the northwestern part of the Czech Republic and enters Germany through its eastern side and finally ends in the North Sea near the town of Cuxhaven.</p> <p>Some of the major tributaries of the Elbe River include Saale, Mulde, Ohre, Vltava, Schwarze Elster, Havel, and Alster.</p>	
Loire River	<p>The Loire River has a length of about 1,006 km and is recognized as France's longest river.</p> <p>It rises from the foothills of the Massif Central in the Cévennes mountain range which is located in the French department of Ardèche.</p> <p>It then flows across the northern and western areas of France and finally drains into the Bay of Biscay.</p>	

	<p>Some of the major tributaries of the Loire river include Erdre, Nièvre, Maine, Cher, Vienne, Sèvre Nantaise, Allier and Indre.</p> <p>Located in the central part of the Loire river valley is the Forest of Orléans which encompasses an area of 94,480 acres and is considered as the largest forest in France.</p> <p>About 164 bird species and 57 fish species are found in the Loire River basin.</p>	
Oder river	<p>The Oder River has a length of about 840 km and is the second-longest river in Poland.</p> <p>It originates in the rugged mountains of the eastern Czech Republic and flows through the western part of Poland where it forms a border between Poland and Germany.</p> <p>The main branch of the river empties into the Szczecin Lagoon and its other three branches, the Peene, Świna, and Dziwna drains into the Baltic Sea.</p>	
Po river	<p>The Po River has a length of about 652 km and is Italy's longest river.</p> <p>It rises from the upper reaches of the Cottian Alps and flows from west to east across the northern portion of Italy and eventually drains into the Adriatic Sea.</p> <p>The Po River flows through several major Italian cities including Cremona, Milan, Ferrara, Piacenza, and Turin.</p> <p>The cities of Milan and Turin, which serve as major industrial centers in the country, utilize the waters of the Po River for industrial purposes.</p> <p>The river is fed by a total of 141 tributaries such as Rotaldo, Pellice, Grana del Monferrato, Nure, Adda, Chisola, and Dora Riparia.</p>	

<p>Tagus river</p>	<p>The Tagus River measures about 1,007 km long and is the Iberian Peninsula's longest river.</p> <p>It originates from the Montes Universales mountain range in the eastern part of Spain and flows westwards across the country.</p> <p>It then enters Portugal and flows in the southwestward direction before emptying into the Atlantic Ocean near the Portuguese capital city of Lisbon.</p> <p>Some of the major tributaries of the Tagus river include Gallo, Alberche, Jarama, Alagón, Algodor, Guadiela, Ibor, and Almonte.</p>	
<p>Shannon river</p>	<p>The Shannon River has a length of about 360.5 km and is the Republic of Ireland's longest river.</p> <p>It rises from the Shannon Pot, a small pool on the slopes of the Cuileagh Mountain.</p> <p>The river then flows southwards through a series of lakes and turns west to eventually drain into the Atlantic Ocean via the Shannon Estuary.</p> <p>The river passes through 11 Irish counties that are situated in the massive Shannon River Basin that covers about one-fifth of the total land area of Ireland.</p>	
<p>Rhone river</p>	<p>The Rhône River has a length of about 813 km and originates in the Rhône Glacier of the Swiss Alps.</p> <p>This fast-flowing river flows into the eastern end of Lake Geneva and then moves in the southward direction through the southeastern part of France.</p> <p>Before emptying into the Mediterranean Sea, the Rhone river divides into two sections, namely the Great Rhône and Little Rhône, at the French city of Arles.</p>	

Rhine river

The **Rhine River** has a length of about **1,230 km** and **originates** from the southeastern part of the **Swiss Alps** in the **Canton of Grisons, Switzerland**.

The river then flows northwards through the **large Rhine Valley** and forms the international boundary between **Switzerland and Liechtenstein** and later the boundary between **Switzerland and Austria**.

In Austria, the river flows into **Lake Constance**. The river then flows westwards out of the lake as **High Rhine** and forms Switzerland's northeastern border with Germany.

The river then falls over **22 m** and is then known as the **Rhine Falls**.

In the **city of Basel in Switzerland**, the river turns in the northward direction and is referred to as the **Upper Rhine**.

This part of the river forms the **boundary** between **Germany and France**.

Then, the Rhine flows into the Netherlands where it is divided into **three branches (Rhine-Meuse-Scheldt)**.

The river then finally empties into the **North Sea**.

Some of the **notable tributaries** of the **Rhine river** include **Aare, Tamina, Moselle, Erft, Rein da Tuma, Plessur, Rotach, and Wiese**.

The **principal cities** that are located along the Rhine river include **Düsseldorf, Basel, Rotterdam, Cologne, and Strasbourg**.



34. INS Sindhukesari

Section: Places in news

Concept:

- **INS Sindhukesari has become the first Indian submarine to dock in Jakarta, Indonesia.**
- The submarine, which was on operational deployment, travelled through the **Sunda Strait** and undertook the maiden docking in Indonesia for Operational Turnaround.
- It significantly expands the area operational reach of the submarine arm near crucial shipping lanes and the strategic **Malacca Strait**.

About INS Sindhukesari :

- It is a 3,000-tonne Kilo-class diesel-electric submarine.

- It was **designed as part of Project 877** and built under a contract between Rosvooruzhenie, Russia, and the Ministry of Defence (India).
- **Features:**
 - It has a displacement of 3,000 tons.
 - It has a maximum diving depth of 300 meters, a speed of up to 18 knots, and can operate solo for 45 days with a crew of 53.

Strait of Malacca



- Strait of Malacca connects the **Andaman Sea (Indian Ocean) and the South China Sea (Pacific Ocean)**.
- **Stretching about 800km**, it is the **longest straits in the world** and facilitates not just shipping and the movement of people in the surrounding communities but is a confluence of trade, cultures, ideas, and knowledge between the East and West.
- It runs between the **Indonesian island of Sumatra to the west and peninsular (West) Malaysia and extreme southern Thailand to the east** and has an area of about 25,000 square miles (65,000 square km).
- The strait derived its name from the trading port of Melaka (formerly Malacca)—which was of importance in the 16th and 17th centuries—on the Malay coast.
- As the link between the **Indian Ocean and the South China Sea**, the Strait of Malacca is the **shortest sea route between India and China** and hence is one of the most heavily travelled shipping channels in the world.
- **Singapore, one of the world's most important ports**, is situated at the **strait's southern end**.
- The global shift in economic power from the West to the East coupled with burgeoning trade, investments, and production in areas spanning the Indian and Pacific Ocean regions has given increasing importance to this region.

Sunda Strait



- It links the **Java Sea (Pacific Ocean) with the Indian Ocean** (south).
- **Sunda Strait**, Indonesian Selat Sunda, is a channel, 16–70 miles (26–110 km) wide, **between the islands of Java (east) and Sumatra**.
- The Sunda Strait is an important passage connecting the **Indian Ocean with eastern Asia**.
- The strait stretches in a roughly northeast/southwest orientation, with a minimum width of 24 km (15 mi) at its northeastern end between Cape Tua on Sumatra and Cape Pujat on Java.
- It is very deep at its western end, but as it narrows to the east it becomes much shallower, with a depth of only 20 m (65 feet) in parts of the eastern end.
- It is notoriously difficult to navigate because of this shallowness, very strong tidal currents, sandbanks, and man-made obstructions such as oil platforms off the Java coast.
- **The strait's narrowness, shallowness, and lack of accurate charting make it unsuitable for many modern, large ships, most of which use the Strait of Malacca instead.**

8. Earth's innermost inner core

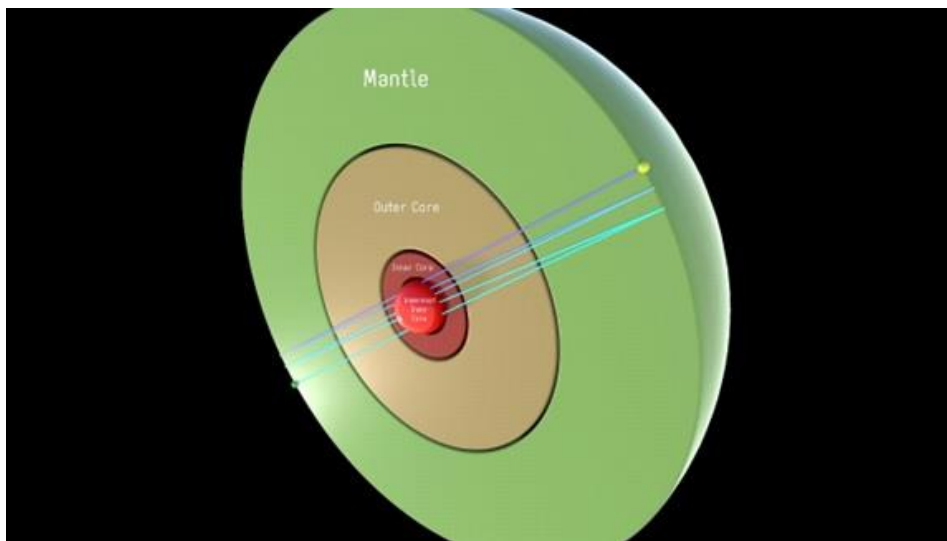
Section: Physical Geography

Concept:

- Seismologists at The Australian National University (ANU) recently documented the evidence of a distinct fifth layer of earth at the centremost part of Earth—the “innermost inner core”.

About Earth's innermost inner core (IMIC):

- It is a 400-mile-wide (644-kilometer-wide) ball of metal.
- IMIC exists in a solid state as an alloy of iron and nickel** because of the extreme pressure at the center of the Earth.
- Its temperature is estimated to be about 5,500-6,000 degrees (Celsius/9,930-10,830 Fahrenheit), **similar to the sun's surface temperature**.
- It has a distinct anisotropy, which is a property of a substance that allows it to take on different characteristics depending on the angle from which it's approached.
- The concept of the innermost part of the inner core was first proposed in 2002 by seismologists from Harvard University—Miaki Ishii and Adam Dziewonski.



About the Inner core of the Earth:

- It is a **solid metallic ball made mainly of iron**.
- The inner core is solid due to the pressure caused by the weight put on it by the Earth's other top layers.
- It is **distinct from the outer core, which is a liquid**.
- Radius:**
 - The inner core has an average radius of 1220 km.
 - The boundary between the inner and outer core is located at approximately 5150 km below the surface of the Earth.
 - This boundary is called the **Lehman Seismic Discontinuity**.
- Temperature:** Inner core temperatures reach extraordinary levels, estimated to be between 7,200–8,500°F (4,000–4,700°C).
- Properties:**
 - It is predicted to have very high thermal and electrical conductivity.
 - The inner core generates its own magnetic field and spins a bit faster than the rest of the planet.

35. IMD is already sensing heat waves

Section :Climatology

Context: In the week of February 21, the India Meteorological Department (IMD) warned that the maximum temperatures over northwest, west, and central India would be 3-5° C higher than the long-term average.

Origin of heat waves

- Heat waves are **formed for one of two reasons**: because warmer air is flowing in from elsewhere or because something is producing it locally.
 - Air is warmed locally when the **air is warmed by higher land surface temperature** or because the **air sinking down from above is compressed along the way**, producing hot air near the surface.

- A study published in **Nature Geoscience** offers some clues as to how different processes contribute to the formation of a heat wave.
 - In **spring**, India typically has **air flowing in from the west-northwest**. In the context of climate change, the **Middle East is warming faster** than other regions in latitudes **similarly close to the equator**, and **serves as a source of the warm air** that blows into India.
 - Likewise, **air flowing in from the northwest rolls in over the mountains of Afghanistan and Pakistan**, so some of **the compression also happens** on the leeward side of these mountains, entering India with a bristling warmth.
 - The **air flowing in over the oceans** is expected to bring cooler air, since land warms faster than the oceans. The Arabian Sea is warming faster than most other ocean regions.
 - The **strong upper atmospheric westerly winds that come in from the Atlantic Ocean** over to India **during spring** control the near-surface winds. Any time winds flow from the west to the east. The descending air compresses and warms up to generate some heat waves.
 - The so-called **lapse rate** – the rate at which temperatures cool from the surface to the upper atmosphere – **is declining under global warming**. In other words, global warming tends to warm the upper atmosphere faster than the air near the surface. This in turn means that the **sinking air is warmer due to global warming**, and thus produces heat waves as it sinks and compresses.

Heat Waves:

- A heat wave is a **period of abnormally high temperatures**, more than the normal maximum temperature that occurs during the summer season in the North-Western and South Central parts of India.
- It is a condition of air temperature which **becomes fatal to the human body** when exposed.
- The IMD declares a heatwave when the **maximum temperature crosses a certain threshold — 40°C in the plains, 37°C along the coast, and 30°C in hilly regions**.
- Alternatively, a heatwave is declared **if the maximum temperature rises by between 5°C and 6.4°C above normal**.
- A **severe heatwave** is declared when the **maximum temperature rises more than 6.4°C above normal**.
- A third condition for a heatwave arises when an area records a **maximum temperature of more than 45°C and up to 47°C on any given day**.

36. The Yellow River has been known as ‘China’s sorrow’

Section: Places in news

Context: Deforestation, erosion on the Loess Plateau caused the Chinese to construct levees to tame the river, in turn, worsening the risk of flooding

More on the News:

- The mighty Yellow River, the ‘mother river’ of Chinese civilisation, has also been **known as the ‘River of Disaster’ and ‘China’s sorrow’** because of the devastating floods it has wrought in its basin from pre-history to the last century.
- The study’s author’s geologists, paleontologists and environmental scientists from Jiangsu Normal University, the Chinese Academy of Science as well as the Coastal Carolina University in the United States visited several sites along the river.
- They also **studied sediment and historical records** to conclude that the river **used to flood four times every century** before humans began to alter the environment.
- Around 6,000 years (3500 Before Common Era), when humans brought the **practice of settled farming** to the region, the **river began to flood 10 times**.
- The authors pinpointed the **Chinese practice of building mud embankments** especially during the Imperial Period to **‘tame’ the river as having only made matters worse**.

Yellow River

- Yellow River or Huang He is the **second-longest river** in China, **after the Yangtze River**, and the **sixth-longest river system in the world** at the estimated length of 5,464 km.
- **Originating** in the **Bayan Har Mountains in Qinghai province** of Western China, it flows through nine provinces, and it **empties into the Bohai Sea** near the city of Dongying in Shandong province.
- The river has long been critical to the development of northern China, and is regarded by scholars as **one cradle of civilization**.
- Among the deadliest were the 1332–33 flood during the Yuan dynasty, the 1887 **flood during the Qing dynasty** which killed anywhere from 900,000 to 2 million people, and a Republic of China era 1931 flood (part of a massive number of floods that year) that killed 1–4 million people.
- The cause of the floods is the **large amount of fine-grained loess** carried by the river from the Loess Plateau, which **is continuously deposited along the bottom of its channel**. The sedimentation causes natural dams to slowly accumulate.
- These subaqueous dams are unpredictable and generally undetectable. Eventually, the enormous amount of water needs to find a new way to the sea, **forcing it to take the path of least resistance**. When this happens, it **bursts out across the flat North China Plain**, sometimes taking a new channel and inundating most farmland, cities or towns in its path.

37. Coconut

Section :Economic geography

Context: Coconut Development Board, in association with International Coconut Community (ICC), is organizing the two-day International Conference on Trade and Marketing of Coconut Products, in Hyderabad.

Concept:

- **Ranking in production:** India is the **largest coconut producing country** in the world, with 30.93% share of global production, followed by Indonesia and Philippines. India ranks **second in terms of productivity**
- **Distribution: Traditional areas** of coconut in India are the states of Kerala, Tamilnadu, Karnataka, Andhra Pradesh, Orissa, Goa, West Bengal, Pondicherry, Maharashtra and Islands of Lakshadweep and Andaman and Nicobar. However, **several states like** Assam, Gujarat, Madhya Pradesh, Bihar, Tripura, Manipur, Nagaland and Arunachal Pradesh have emerged as non-traditional areas for the cultivation of coconut.
- **Climatic Conditions: tropical plant** but has been found to grow under varying agro climatic conditions.
- **Temperature and rainfall:** mean annual temperature of around 27°C, evenly distributed annual rainfall ranging from 100 cm to 300 cm.
- **Altitude:** 600 m above sea level.
- **Soil types :** laterite, alluvial and coastal sandy soils.

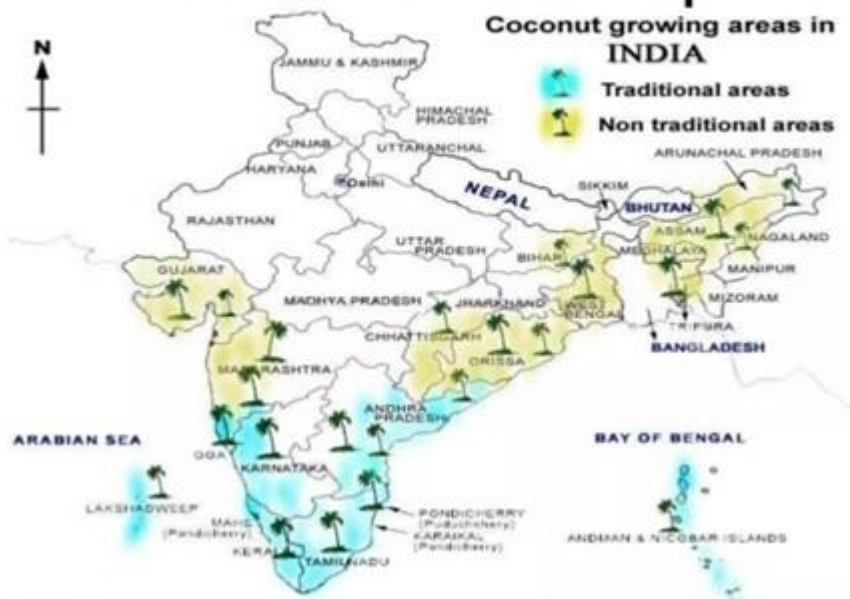
Coconut Development Board

- Coconut Development Board (CDB) is a **statutory body** established under the **Ministry of Agriculture and Farmers Welfare**, for the integrated development of coconut cultivation and industry with focus on productivity increase and product diversification.
- **Headquarters:** Kochi in Kerala
- **Regional Offices** at Bangalore, Chennai, Guwahati and Patna.
- **State Centres:** Pitapally in Odisha, Kolkata, Thane, Vijayawada and Port Blair.
- **Market Development cum Information Centre:**
- **Technology Development Centre:** Vazhakulam near Aluva in Kerala and a **Field office** at Thiruvananthapuram in Kerala.

FUNCTIONS OF THE BOARD

- Adopting measures for the development of coconut industry, inter alia.
- Imparting technical advice to those engaged in coconut cultivation and industry.
- Providing financial and other assistance for the expansion of area under coconut.
- Encouraging adoption of modern technologies for processing of coconut and its products.
- Adopting measures to get incentive prices for coconut and its products.
- Recommending measures for improving marketing of coconut and its products.
- Recommending measures for regulating imports and exports of coconut and its products.
- Fixing grades, specifications and standards for coconut and its products.
- Financing suitable schemes to increase the production of coconut and to improve the quality and yield of coconut.
- Assisting, encouraging, promoting and financing agricultural, technological, industrial or economic research on coconut and its products.
- Collecting statistics on coconut and its products and publishing them.
- Undertaking publicity activities and publishing books and periodicals on coconut and its products.

India Coconut Map



38. Ocean energy systems

Context: National Institute of Ocean Technology, is currently coordinating the development of the maiden ocean energy-powered desalination plant, at Kavaratti island in Lakshadweep. The plant is presently powered by diesel.

Ocean Energy:

- Ocean energy is a **form of renewable energy** which can be harnessed with the power of waves, currents, tides, temperature gradients and salinity gradients.
- The energy from oceans can be harvested in the following forms:
 1. **Tidal Energy**
 - The **difference in water level from low tide and high tide** is potential energy that can be harnessed.
 - Similar to hydropower generated from dams, **tidal water is captured in a barrage across an estuary during high tide and forced through a turbine during low tide**
 2. **Wave Energy**
 - Wave energy is **generated by the movement of a device either floating on the surface of the ocean or moored to the ocean floor** by the force generated by the ocean waves
 - The kinetic energy pumps fluid through turbines and generates electric power
 3. **Current Energy**
 - Kinetic energy **can be captured from the ocean currents, and other tidal currents** with submerged turbines that are very similar in appearance to miniature wind turbines
 - Similar to wind turbines, the movement of the marine current moves the rotor blades to generate electric power
 4. **Ocean Thermal Energy Conversion (OTEC)**
 - Ocean thermal energy conversion, or OTEC, **uses ocean temperature differences from the surface to depths lower than 1,000 meters**, to harness energy. A temperature difference of even 20°C can yield energy efficiently.
 5. **Osmotic Energy**
 - This technique **produces energy from the movement of water across a membrane between a saltwater reservoir and fresh water reservoir.**

About Deep Ocean Mission <https://optimizeias.com/deep-ocean-mission-gets-rs-600-crore/>

Government Schemes

1. PM CARES Fund administered like PM's National Relief Fund, HC told

Concept:

- The **Prime Minister's Office (PMO)** has told the Delhi High Court that **the PM CARES Fund is administered in a similar pattern as that of the Prime Minister's National Relief Fund (PMNRF)** as both are **chaired by the Prime Minister.**

- The PMO has held that the **PM CARES Fund, which was created in 2020** in the wake of the COVID pandemic, **cannot be considered a government fund** as the donations to it do not flow into the Consolidated Fund of India.
- The **PMO has further added that the PM CARES Fund has been created as a “Public Charitable Trust,” and no third-party information can be parted** with irrespective of its status.
- **Petitions have been filed in the courts** of India seeking to declare the PM CARES Fund a “State” under the Constitution and **also to declare PM CARES as a “public authority” under the Right to Information (RTI) Act.**

About PM CARES Fund:

- The **Prime Ministers Citizen Assistance and Relief in Emergency Situations Fund (PM CARES Fund)** was created on 28 March 2020, following the COVID-19 pandemic in India.
- It was created for combating, and containment and relief efforts against the coronavirus outbreak and similar pandemic like situations in the future.
- It has been **registered as a Public Charitable Trust.**

Objectives:

- To provide assistance and relief to all the affected persons in the event of any calamity, disaster, public health emergency or any other emergency of any kind that may be either natural or man-made.
- Creation as well as upgradation of any pharmaceutical facilities, funding a research, creation or upgradation of any necessary infrastructure, healthcare support or any other kind of support.

Composition of the Trust:

- **Prime Minister is the ex-officio Chairman** of the PM CARES Fund.
- **Minister of Defence, Minister of Home Affairs and Minister of Finance, Government of India are ex-officio Trustees** of the Fund.
- The **Trust Deed of the Fund** gives the Chairman of the Board of Trustees, i.e. the Prime Minister, the **power to nominate three Trustees to the Board of Trustees.**

Contributions:

- The fund **consists entirely of voluntary contributions from individuals/organizations** and does not get any budgetary support.
- The contributions to the Fund **can be from any individuals or any organizations** including companies, other charitable institutions, associations, etc.
- PM CARES Fund allows **option for Micro donation, one can donate as low as Rs 10** in the PM CARES Fund.
- Donations to PM CARES Fund **would qualify for 80G benefits for 100% exemption under the Income Tax Act.**
- Donations to PM CARES Fund will also **qualify to be counted as Corporate Social Responsibility (CSR)** expenditure under the Companies Act, 2013.
- It has also got exemption under the FCRA. This enables PM CARES Fund to accept donations and contributions from individuals and organizations based in foreign countries

2. Accelerator fund for agri-startups

Section :Agriculture

Context: The government will set up an accelerator fund for agri-startups: Budget

More on the News:

- The government will **set up an accelerator fund for agri-startups to increase digital infrastructure in the rural areas and boost startups** in this space.
- The fund will work towards **implementing cost-effective solutions to address the various challenges faced by farmers** by introducing cutting-edge technologies and increasing output.

Agriculture Accelerator Fund:

- The fund is to be setup to **increase the number of agricultural startups** in the rural areas
- The main aim of the fund is to **provide innovative and affordable solutions**
- It will focus only on farmers and the challenges faced by them
- **More young entrepreneurs will be encouraged** to begin agri-startups using these funds
- Startups focusing on **cost-effective solutions** will be given priorities
- Also, technology startups that **aim to increase agricultural outputs** will be given preference.

3. Funds for minority scheme slashed by 38 percent

Concept :

- The Budget allocation for the Ministry of Minority Affairs was reduced by 38% for the financial year 2023-24 to the year 2022-23.

- Several scholarship and skill development schemes got major fund cuts including the merit cum means scholarship for professional and technical courses for students from minority communities.
- The schemes have been allotted funds of ₹44 crore this year, while the Budget for the same was ₹365 crore last year.
- Also, the budget allocation for the Pradhan Mantri Jan Vikas Karyakram (PMJVK) is reduced massively this year.
- The Budget for PMJVK was ₹1,650 crore last year which is reduced to 600 crores this year.

Pradhan Mantri Jan Vikas Karyakram

- The **Pradhan Mantri Jan Vikas Karyakram (PMJVK)** is a **Centrally Sponsored Scheme**, under the Ministry of Minority Affairs.
- PMJVK is implemented through the **State Governments/ Union Territory Governments**.
- **Projects under PMJVK are proposed by the States/ UTs** where land is already available with the State/ UT.
- The **Central Government does not acquire land for construction under the scheme**. The **land cost or land acquisition costs are not covered under this programme**.
- The State Government/UT administration **reports the progress to the Ministry of Minority Affairs in respect of each project on quarterly basis** for both physical and financial progress in the performance of Quarterly Progress Report (QPR) prescribed for this purpose.
- The PMJVK guidelines also provide for quarterly **meetings by the District Level Committee to review the progress of implementation of the projects under PMJVK and submission of reports to the State Level Committee (SLC)**.
- The **Pradhan Mantri Jan Vikas Karyakram (PMJVK)** is **implemented in 1300 identified Minority Concentration Areas (MCAs) of the Country** with the objective to develop socio-economic infrastructure assets and basic amenities in these areas.
- The scheme is **now implemented in all Districts of the country including all the Aspirational Districts**.

4. Vehicle scrapping policy

Concept :

- The Union Budget for 2023-24 has laid special emphasis on vehicle scrapping policy by allocating adequate funds to replace vehicles that are over 15 years.
- Finance Minister Nirmala Sitharaman today **announced that “adequate funds” have been allocated in the Union Budget 2023-24** to scrap and **replace old vehicles of the central government**.
- Also, the **states will be supported in replacing old government vehicles and ambulances**.
- The move is part of Prime Minister Narendra Modi government’s aim to support a green economy.
- In furtherance of the **Vehicle Scrapping Policy, mentioned in the Budget 2021-22**, I’ve allocated adequate funds to scrap old vehicles of the central government,” Sitharaman said.

Vehicle Scrappage Policy

- It was first **announced in the Union Budget 2021-22**.
- The Vehicle Scrapping Policy is aimed at creating an eco-system for phasing out unfit and polluting vehicles in an environment friendly and safe manner.
- The policy intends to create scrapping infrastructure in the form of Automated Testing Stations and Registered Vehicle Scrapping Facilities across the country.
- **Old and unfit vehicles whose life cycle is complete shall be scrapped**. This will be a **voluntary process but defined by rules**.
- For instance, old vehicles (15 to 20 years) need not be scrapped compulsorily. However, **they will have to undergo a fitness test after a defined period. Failing the test would most likely lead to vehicle scrappage**.
- The policy would cover an estimated 51 lakh light motor vehicles (LMVs) that are above 20 years of age and another 34 lakh LMVs above 15 years of age.
- Rules and regulations will be made around the actual scrapping process, which shall be laid out in the announcement made by the MoRTH.
- Vehicle owners will be given certain benefits for scrapping old vehicles.
- As a **disincentive, increased re-registration fees would be applicable for vehicles 15 years or older** from the initial date registration.
- The **state governments may be advised to offer a road-tax rebate of up to 25% for personal vehicles and up to 15% for commercial vehicles to provide incentive to owners of old vehicles to scrap old and unfit vehicles**.

5. FM moots national digital library

Concept :

- Finance Minister Nirmala Sitharaman has **proposed a national digital library for children and adolescents along with strengthening of the National Book Trust**, for building a “culture of reading” and to make up for pandemic time learning losses.
- She said the States would be encouraged to set up physical libraries at panchayat and ward levels, and provide infrastructure for accessing the **National Digital Library resources**.

National Digital Library

- National Digital Library of India (NDLI) is a project of the **Ministry of Human Resource Development** under the aegis of **National Mission on Education through Information and Communication Technology (NMEICT)**.
- It is **developed by IIT Kharagpur**.
- **Objective:** The objective of NDL is to make digital educational resources available to all citizens of the country to empower, inspire and encourage learning.
- **Key facts:**
- NDL is the **Single Window Platform** that collects and collates metadata from premier learning institutions in India and abroad, as well as other relevant sources.
- It is a **digital repository** containing textbooks, articles, videos, audio books, lectures, simulations, fiction and all other kinds of learning media.
- It makes quality learning resources available to all learners and has 1.7 Crore content from more than 160 sources, in over 200 languages.

About NMEICT:

- The **National Mission on Education through Information and Communication Technology (ICT)** has been envisaged as a **Centrally Sponsored Scheme** to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions in any time anywhere mode.
- The **Mission has two major components** – providing connectivity, along with provision for access devices, to institutions and learners; and content generation.

National Book Trust

- NBT, India is an **apex body established by the Government of India** (Department of Higher Education, Ministry of Human Resource Development) in the **year 1957**.

Objectives of the NBT are

- to produce and encourage the production of good literature in English, Hindi and other Indian languages.
- to make such literature available at moderate prices to the public.
- to bring out book catalogues, arrange book fairs/exhibitions and seminars and take all necessary steps to make the people book minded.

6. Assam crackdown on Child Marriage – What does the law say

Concept :

- The Assam Government has arrested over 2,000 men in a state-wide crackdown on child marriages.
- Chief Minister Himanta Biswa Sarma said that the police will retrospectively book people who participated in child marriage in the last seven years.
- Assam has a high rate of maternal and infant mortality, with child marriage being the primary cause, according to reports by the National Family Health Survey (NFHS).

Men are arrested under which law?

- Men who married girls below 14 years of age would be booked under the **Protection of Children From Sexual Offences Act, 2012 (commonly known as POCSO Act)**.
- The POCSO Act criminalises sex between a minor and an adult.
- The law does not recognize a minor's consent as valid.
- Meanwhile, those marrying girls between 14 and 18 years would be booked under the **Prohibition of Child Marriage Act, 2006**.

Protection of Children from Sexual Offences (POCSO) Act:

- The POCSO Act was enacted in 2012. It criminalises sex between a minor and an adult.
- It is a gender-neutral act; it also recognizes that boys can also become victims of sexual violence as well.
- It defines a child as someone under the age of 18.
- The law **does not recognize a minor's consent as valid**.
- **Section 19 of the POCSO Act** imposes a “**mandatory reporting obligation**” which requires every person who suspects or has knowledge of a sexual offence being committed against a child must report it to the police or the Special Juvenile Police Unit. Failure to do so will result in imprisonment, a fine, or both.
- The mandatory reporting obligations also **require doctors to report cases where minor girls seek medical services during pregnancies**.

Prohibition of Child Marriage Act 2006:

- The act says that **child marriages are illegal but not void**.
- They are **voidable only when the minor partner asks the court to declare the marriage void**.

- The Act prescribes **18 years as the minimum marriageable age for women**, while for men it is 21 years.
- The Act punishes child marriage with imprisonment **which may extend to 2 years or with a fine which may extend to Rs 1 lakh or both.**
- The punishment also extends to anyone who performs or conducts any child marriage.

The debate over the Muslim legal age of marriage under personal law:

- Under Muslim personal laws, the **marriage of a bride who has attained puberty is legal.**
- Puberty is **presumed on completed at the age of 15 years.**
- The age gap difference provision between Muslim personal law and special legislation prohibiting child marriages or the sexual activity of minors classifying it as a criminal offence.

Judiciary's Opinion:

- The Supreme Court is currently examining this issue since different High Courts have ruled differently on it.
- In January 2013, the Karnataka High Court ruled that the Prohibition of Child Marriage Act will have an overriding effect on the provisions of Muslim personal laws.
- Recently, The Punjab and Haryana High Court in a string of rulings has held that a Muslim girl can legally marry after attaining puberty.
- In October 2022, the Karnataka High Court quashed a POCSO case against a Muslim man.
- He was arrested after a hospital made mandatory disclosures under the law when his pregnant wife, aged 17 years and two months visited a doctor.

Central Government's Opinion:

- In 2021, the Central government sought to introduce the Prevention of Child Marriage (Amendment) Bill 2021, to raise the marriageable age for women across all religions, from 18 to 21 years.
- However, the Parliament panel examining this is yet to submit its report, after receiving an extension in October 2022.
- Ministry of Women & Child Development in 2020 had formed a **committee headed by Jaya Jaitly to examine the matter.**
- The committee submitted a report stating that the **marriageable age for women should be increased from 18 to 21 years of age, in light of factors like reproductive health, education, etc.**

7. PM- ABHIM

Section: Health

Concept:

- World Bank has approved \$1 billion loans for Pradhan Mantri Ayushman Bharat Infrastructure Mission (PM ABHIM).
- The loan agreements have been signed to augment PMABHIM which was launched **on October 25, 2021, with an outlay of about ₹64,180 crore (till FY 2025-26)** to strengthen healthcare infrastructure across the country.

PM-Ayushman Bharat Health Infrastructure Mission

- The scheme aims at strengthening healthcare infrastructure across the country.
- Its objective is to **fill gaps in public health infrastructure**, especially in critical care facilities and primary care in both urban and rural areas.
- Through this, **critical care services will be available in all the districts of the country with more than five lakh population** through exclusive critical care hospital blocks, while the remaining districts will be covered through referral services.
- It will provide support to 17,788 **rural Health and Wellness Centres in 10 'high focus' states and establish 11,024 urban Health and Wellness Centres** across the country.
- People will have **access to a full range of diagnostic services in the public healthcare system** through a network of laboratories across the country.
- **Integrated public health labs will also be set up in all districts**, giving people access to "a full range of diagnostic services" through a network of laboratories across the country.
- All the public health labs will be connected through the Integrated Health Information Portal, which will be expanded to all states and UTs.
- **An IT-enabled disease surveillance system will be established** through a network of surveillance laboratories at **block, district, regional and national levels.**

Institutions to be set-up under the scheme:

- Under the scheme, a **national institution for one health**, four new national **institutes for virology**, a regional **research platform for WHO** (World Health Organization) South East Asia Region, **nine biosafety level-III laboratories**, and **five new regional national centres for disease control** will be set up.
- **Biosafety Level 3:** The **pathogens that can cause serious health hazards** are worked under biosafety level 3.

8. India moves to 5th place in global ranking of accreditation systems for quality

Section :Indices

Concept:

- India has been **placed at the fifth position out of 184 countries** in terms of its **accreditation system**, according to the recently released **Global Quality Infrastructure Index (GQII) 2021**.

Global Quality Infrastructure Index (GQII)

- GQII is an initiative on metrology, standardization, accreditation and related services, supported by **Physikalisch-Technische Bundesanstalt (PTB)** and the **Federal Ministry for Economic Cooperation and Development (BMZ), Germany**.
- The GQII ranks 184 economies on the basis of their **quality infrastructure (QI)**.
- QI is the technical backbone for international trade, with metrology, standardisation, accreditation and conformity assessment services providing reliability and trust between trading partners.
- The GQII measures the **relative development of countries' QI**.
- The GQII rankings are **published and presented post-facto for each year** based on the data **collected till the end of that year**.

India's Performance

- India's overall QI system ranking continues to be tenth.**
- According to the index, **India was ranked 21st in terms of metrology and ninth in standardization.**
- Quality Council of India (QCI) is the national body for accreditation, Bureau of Indian Standards (BIS) is the main body for formulation of standards and the Council Of Scientific And Industrial Research – National Physical Laboratory (CSIRNPL) for the metrology system.**

Accreditation system

- Accreditation helps establish the competence and credibility of conformity assessment bodies which perform testing, certification and inspection.
- The **national accreditation system** as per international standards in India is **established by the QCI**.
- The system is operated through the **constituent boards of QCI**, primarily the **National Accreditation Board for Certification Bodies**, which provides accreditation to the certification, inspection, and validation/ verification bodies, and the **National Accreditation Board for Testing and Calibration Laboratories**, which provides accreditation to the testing, calibration and medical laboratories.

9. PM to open Aadi Mahotsav Festival

Section :Tribal

Concept :

- Prime Minister of India will inaugurate the Aadi Mahotsav festival of the Tribal Cooperative Marketing Development Federation of India Ltd. (TRIFED) on February 16 in New Delhi's Major Dhyan Chand Stadium.

About Aadi Mahotsav:

- It is an **annual Tribal Festival** that was started in **the year 2017**.
- It is a **joint initiative of the Ministry of Tribal Affairs & Tribal Cooperative Marketing Development Federation of India (TRIFED)**.
- It aimed to familiarise the people with the rich and diverse craft, and the culture of the tribal communities, in one place.
- Theme: **"A Celebration of the Spirit of Tribal Crafts, Culture and Commerce"**

About TRIFED

- TRIFED came into existence in 1987 under the **Multi-State Cooperative Societies Act, of 1984**.
- It is a **national-level apex organization** functioning under the **administrative control of the Ministry of Tribal Affairs**.
- It is headquartered at **New Delhi**.
- Objectives of the Organisation:** Socio-economic development of tribal people in the country by way of marketing development of tribal products.
- The organisation assists tribal people in exploring and creating opportunities to market the developed products in national and international markets on a sustainable basis.
- Under the **TRIBES India brand**, the sourced handcrafted products from the tribal people are sold.

10. Changes in organ transplant rules

Section :Health

Concept :

- The Union health ministry modified national organ transplantation guidelines to allow even those above 65 years of age to register to receive an organ for transplantation from deceased donors.

Background

- The Union Health Ministry is working on a '**One Nation, One Organ Allocation**' policy in consultation with states to come up with uniform guidelines for registration, allocation and other aspects of the process.
- Working towards firming up the policy, the ministry has recommended several changes in the organ transplant rules.
- The government is also planning to introduce a chapter in school curriculum regarding organ donation awareness for students.

What are the changes brought in organ transplantation policy?

- **Upper age limit for registration has been removed :**
 - The new guidelines have done away with the 65-year age limit for registration of patients seeking organs from a deceased donor.
 - There was no age cap for living donor transplants, where family members donate organs like kidneys and livers.
 - However, people over the age of 65 years couldn't register to receive organs from deceased donors as per guidelines of NOTTO
- **No domicile requirement :**
 - It has asked states to remove the domicile criterion for registering those seeking organs from deceased donor for transplant procedures.
 - Now the needy person can go to any state of the country and register for getting organ and also get the transplant done.
 - The patient will be allotted a unique ID by NOTTO on registering.
 - This will get carried forward even if the patient changes multiple hospitals in different States.
- **No registration fee required :**
 - Noting that some states have been charging fees ranging between Rs 5,000 to 10,000 for registering such patients, the Union Health Ministry has asked them not to charge money.

Regulatory frameworks guiding the organ transplantation in India

- **Legislation**
- In 1994, The **Transplantation of Human Organs Act (THOA)** was promulgated by the government of India.
- The **Transplantation of Human Organs Rules followed in 1995** and were **last amended in 2014**, increasing the scope of donation and including tissues for transplantation.
- The act made **commercialization of organs a punishable offence and legalized the concept of brain death in India** allowing deceased donation by obtaining organs from brain stem dead person.
- **National Organ and Tissue Transplant Organization (NOTTO)** is a national level organization set up **under Ministry of Health and Family Welfare**.
- Besides laying down policy guidelines and protocols for various functions, it coordinates all the activities associated with organ donation at national level.

National Organ and Tissue Transplant Organisation (NOTTO)

- NOTTO is a national level organization set up under **Directorate General of Health Services, Ministry of Health and Family Welfare**.
- It functions as apex centre for all India activities of coordination and networking for:
 - **National Human Organ and Tissue Removal and Storage Network** – procurement and distribution of organs and tissues.
 - **National Biomaterial Centre (National Tissue Bank)** – registry of Organs and Tissues Donation and Transplantation in country.
- Besides laying down policy guidelines and protocols for various functions, it coordinates all the activities associated with organ donation at national level.

11. Pradhan Mantri Kisan Urja Suraksha evam Uttham Mahabhayan (PM KUSUM) behind schedule

Section : Renewable energy

Concept

- **Kisan Urja Suraksha Evam Uttham Mahabhayan (KUSUM)** is a farmer-oriented solar power scheme that will allow setting up grid-connected solar plants in rural areas and off-grid solar pumps.
- This scheme is implemented by **Ministry of new and renewable energy**.
- Under the scheme, the government plans to incentivise farmers to run solar farm, water pumps and use barren land for generating power for extra income up to Rs 60,000 per acre every year.

Aim:

1. Boosting farmers' income by allowing them to sell additional power to the grid through solar plants.
2. Help farmers access reliable daytime solar power for irrigation
3. Reduce power subsidies
4. Decarbonize agriculture
 - Its previous target is to set up 25,750 megawatts (MW) solar capacity by 2022 to power irrigation pumps.
 - It comprises of three components:
 - Setting up of 10,000 MW of decentralised ground / stilt-mounted grid-connected solar or other renewable energy based power plants
 - Installation of 17.5 lakh standalone solar agriculture pumps
 - Solarisation of 10 lakh grid-connected agriculture pumps
 - Subsidy for buying solar pumps: 30% central + 30% state government + bank loans for 30% of the cost (If farmer needs).

12. 6 years minimum age for Class 1 admission

Section: Education

Context: Students can be admitted to Class 1 only at the age of "6+" years instead of the earlier practice of "5+" years, the Education Ministry told States and Union Territories

Concept:

- NEP 2020, children in the age group of 3 years to 6 years were not covered within the 10+2 structure of formal schooling.
- Under the new structure, children aged 3 to 8 years come under the foundational section including three years of pre-school and two years of primary school followed by preparatory, middle and secondary sections in a 5+3+3+4 formula.

Department of School Education and Literacy has now reiterated

- align their age of admission with the policy and provide admission to Grade-I at the age of 6+ years
- ensure accessibility to three years of quality preschool education for all children, whether they were studying in anganwadis, or in preschools run or aided by the government, by NGOs or by other private players.
- States such as Delhi consider April 1 in the year of admission as the date when a child should be 6 years old or older, while many other States consider January 1 or July 1. The Central government-run Kendriya Vidyalayas also use July 1 as their cut-off date.
- The Centre's reminder is in line with the latest National Education Policy's emphasis on improving foundational learning by bringing early childhood care and education under the formal schooling system and moving it from the aegis of the Ministry of Women and Child Development to the Education Ministry.

13. Adopt a Heritage Scheme

Concept :

- The Dalmia Bharat Group, under the Central Government's **Adopt A Heritage: ApniDharohar, ApniPehchaan** scheme, is now showcasing the history of the Red Fort (17th Century monument) to visitors.

About the Scheme

- The '**Adopt a Heritage: ApniDharohar, ApniPehchaan**' scheme is an initiative of the **Ministry of Tourism, in collaboration with the Ministry of Culture** and the **Archaeological Survey of India**.
- It was launched in **September 2017**.
- Under it, the **government invites** entities, including public sector companies, private sector firms as well as individuals, **to develop selected monuments and heritage and tourist sites across India**.
- Development of these tourist sites calls for providing and maintaining basic amenities, including drinking water, ease of access for the differently abled and senior citizens, standardized signage, cleanliness, public conveniences and illumination, along with advanced amenities such as surveillance systems, night-viewing facilities and tourism facilitation centres.
- The **sites/monument are selected on the basis of tourist footfall and visibility** and can be **adopted by private and public sector companies and individuals** — known as **Monument Mitras** — for an initial period of five years.
- The Monument Mitras are selected by the 'oversight and vision committee,' co-chaired by the Tourism Secretary and the Culture Secretary, on the basis of the bidder's 'vision' for development of all amenities at the heritage site.
- **Note: There is no financial bid involved.**
- The corporate sector is **expected to use corporate social responsibility (CSR) funds** for the upkeep of the site.
- The **oversight committee also has the power to terminate** a memorandum of understanding in **case of non-compliance or non-performance**.

14. Budget for cooperatives to achieve inclusive growth

Concept :

- Budget 2023-24 strengthens the cooperatives to take forward the agenda for inclusive growth.
- Cooperatives as economic entities have a major role in enhancing the income of the small and weaker sections, providing opportunities for employment, enabling access to credit and the market.

Initiatives for Cooperatives

- The Cabinet has also approved the **Centrally Sponsored Scheme — Vibrant Villages Programme for the FYs 2022–23 to 2025- 26 with a financial allocation of ₹4,800 crore.** The scheme will strengthen the cooperative movement through two lakh multipurpose Primary Agricultural Credit Societies in each uncovered panchayat.
- It will lead to infrastructure development and livelihood opportunities in four States and one Union Territory along the northern land border.
- Budget outlay of ₹1,150.38 crore is allocated for **Computerization of 63,000 Primary Agricultural Credit societies (PACS), and establishing National Multi State Cooperative Societies in export, seed and organic products, creation of large grain storage infrastructure and national cooperative database.**
- The **model byelaws on PACS** pave the way to make PACS as multi service centres to dispense services in a timely and affordable manner.
- Budget provides for the **new association and or cooperative society in manufacturing**, to be formed on or after April 2023, which commences manufacturing or production by March 2024.
- It Provided **15% concessional tax to promote new manufacturing co-operative society.**
- **A massive decentralised storage capacity** will be set up to help farmers store their produce and realise remunerative prices through sale at appropriate times through cooperative ecosystem

Draft bye-laws Proposals:

- The Primary Agricultural Cooperative Societies (PACS), are set to get transformed with a **different name and have a CEO to undertake** infrastructure development, building and managing community centres, hospital or educational institutions, and dealership in petrol or diesel, if States agree to accept the draft bye-laws prepared by the Centre.
- The Centre has proposed the PACS may promote subsidiary organisations, such as Farmer Producers Organisation (FPO) with 100 per cent funding from the society for the furtherance of its stated objectives.
- The Centre's proposals brings **enrollment of members under two classes—A and B.**
- A class members (shareholders) will have voting rights and claims over dividends
- B-class (nominal members) will not get voting rights or contest for Board of Governors.
- **For Vibrant Villages Programme, refer – <https://optimizeias.com/vibrant-villages-programme/>**

15. International Intellectual Property index

Section : Reports and Indices

Concept :

- India ranks 42nd among 55 leading global economies on the International IP Index.

International Intellectual Property Index

- It was **released annually by the US Chamber of Commerce Global Innovation Policy Centre (GIPC).**
- The index was started in 2012 and the first edition compared IP environments in 11 economies.
- The Intellectual Property (IP) Index evaluates each economy's ecosystem based on 50 unique indicators which the industry believes represent economies with the most effective IP systems
- **Parameters:** It ranks countries based on **50 unique indicators.**
- These **indicators are divided across nine categories of protection:** 1) Patents 2) copyrights 3) trademarks 4) design rights 5) trade secrets 6) commercialization of IP assets 7) enforcement 8) systemic efficiency and 9) membership and ratification of international treaties.
- **Significance:** The IP Index serves as a roadmap for policymakers who look to support creativity, innovation and economic growth through more robust IP policy.

16. Govt plans 10 'Clean Plant Centres'

Section :Agriculture

Concept :

- With the demand for foreign planting materials of fruits like apples, avocados and blueberries rising over the years, the Central government plans to set up 10 'Clean Plant Centres'

About Clean Plant Centre

- **Objective:** To boost domestic production of the selected fruit crops
- Some of the services offered are **disease diagnostic, therapeutics, multiplying of plants and generation of mother plants.**
- Ministry of Agriculture and Farmers Welfare is the nodal ministry for the programme.
- **Implementing agency:** National Horticulture Board (NHB)

- **It is 100% funded by Central government**
- It will be set up **under the ‘Atmanirbhar Clean Plant Program’** (announced in Budget 2023-24)
- **Significance:**
- Currently, it is difficult to get disease-free and genuine planting materials for horticultural crops in India.
- Also, the process of importing plants is very cumbersome, as the imported plants must be kept in quarantine for two years.
- After the establishment of the Clean Plant Centres, this period will be reduced to six months.

Atmanirbhar Clean Plant Program

- The Program will be **launched with an outlay of 2,200 crores** (in the next 7 years till 2030) to boost availability of disease-free, quality planting material for high value horticultural crops.
- The Program will aim to –
 - Enhance the yield of horticulture crops,
 - Disseminate and adopt climate resilient varieties,
 - Protect the ecosystem through proactive virus and disease control measures.
- The programme **will be anchored by the National Horticulture Board (NHB)** which in turn will set up Clean Plant Centers across the country and ensure the global competitiveness of the Indian horticulture sector.
- The centers will work with the stakeholders so that they adopt clean plant seeds and nurseries.

17. eSanjeevani is a great boon

Context: PM Modi praised eSanjeevani

About eSanjeevani

- It is **Ministry of Health & Family Welfare’s National Telemedicine Service**.
- It is operational in 31 States/Union Territories.
- It is first of its kind online OPD service offered by a country government to its citizens.
- It is conceptualised as a doctor to doctor telemedicine platform in November 2019 for implementation at 155,000 Health and Wellness Centres under Ayushman Bharat Scheme in a Hub & Spokes model.
- It supports two types of telemedicine services viz. Doctor-to-Doctor (eSanjeevani) and Patient-to-Doctor (eSanjeevani OPD) Tele-consultations.
- The eSanjeevani AB-HWC is the doctor to doctor telemedicine platform.
- It has been implemented at around 20,000 Health and Wellness Centres as spokes and over 1800 hubs in around 30 States.
- The eSanjeevani OPD (Patient-to-Doctor) was rolled out in 2020 in order to provide free online medical consultation to sick people at their residence.
- It was developed by the Centre for Development of Advanced Computing (C-DAC).

Centre for Development of Advanced Computing (C-DAC)

- It is the premier R&D organization of the Ministry of Electronics and Information Technology (MeitY) for carrying out R&D in IT & E (Information Technologies and Electronics).

18. SC asks govt. what it has done to end manual scavenging

Section Vulnerable Section

Context: The Supreme Court has directed the government to place on record within six weeks the steps taken by it to implement its nearly 10 years old judgment to end manual scavenging and prevent future generations from the “inhuman practice” while making entry into sewers without safety gear a crime even in emergency situations.

The top court itself had reinforced the prohibition and directed there habilitation of people employed as manual scavengers in its judgment in **Safai Karamchari Andolan And Others vs Union of India**.

What is manual scavenging?

- Manual scavenging is the **practice of removing human excreta by hand from sewers or septic tanks**.
- India **banned the practice under the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 (PEMSR)**.
- The Act bans the use of any individual for manually cleaning, carrying, disposing of or otherwise handling in any manner, human excreta till its disposal.
- In 2013, the definition of manual scavengers was also broadened to include people employed to clean septic tanks, ditches, or railway tracks.
- The Act recognizes manual scavenging as a “dehumanizing practice,” and cites a need to “correct the historical injustice and indignity suffered by the manual scavengers.”

Why is it still prevalent in India?

- According to activist Bezwada Wilson from the SafaiKarmachariAndolan, 472 deaths due to manual scavenging had been recorded from 2016 to 2020.
- The lack of enforcement of the Act and exploitation of unskilled labourers are the reasons why the practice is still prevalent in India.
- The Mumbai civic body charges anywhere between Rs 20,000 and Rs 30,000 to clean septic tanks. The unskilled labourers, meanwhile, are much cheaper to hire and contractors illegally employ them at a daily wage of Rs 300-500.

Compensation:

- As per the Prohibition of Employment of Manual Scavengers and their Rehabilitation (PEMSR) Act, 2013 and the Supreme Court's decision in the **SafaiKarmachariAndolan v/s Union of India case**, to identify all those who died in sewage work since 1993 and provide Rs. 10 lakh each as compensation to their families.

The Prohibition of Employment as Manual Scavengers and their Rehabilitation (Amendment) Bill, 2020:

- It proposes to **completely mechanise** sewer cleaning, introduce ways for 'on-site' protection and provide compensation to manual scavengers in case of sewer deaths.
- It will be an amendment to The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013.
- It is still awaiting cabinet approval.

Governance

1. Open Prison Model

Concept :

- The open prison model adopted in Rajasthan, with convicts staying on community land without high walls or strict surveillance, has promoted a reformatory form of punishment and succeeded in transforming the lives of inmates.

What is Open Prison?

- Open prisons have relatively **less stringent rules as compared to controlled jails**.
- They go by many names like minimum-security prisons, open-air camps or prisons without bars.
- The fundamental rule of an open prison is that the jail has minimum security and functions on the self-discipline of the inmates.
- The jail does not confine them completely but requires them to earn their living to support their families, living with them inside the jail.
- Prisoners can move out of prison for their work and are supposed to come back to the prison campus after their working hours.
- Every state in India has a prison law, like the Rajasthan Prisoners Rules and Andhra Pradesh Prison Rules, 1979.
- **Seventeen states are reported to have functional open jails with Rajasthan having 31 such prisons, the highest that any state has.**
- The **United Nations Standard Minimum Rules for the Treatment of Prisoners, popularly known as the Nelson Mandela Rules**:
- It **laid down the objectives of open prisons** stating that such prisons provide no physical security against escape but rely on the self-discipline of the inmates, providing the conditions most favourable to the rehabilitation of carefully selected prisoners.

Benefits of open prison

- It will reduce overcrowding and operational costs of the prison administration.
- It will reduce the psychological pressure and lack of confidence among prisoners when they assimilate into society.
- It goes with the repeated call to develop a humane attitude and reformatory approach towards the offenders in society.

Right to Life and Personal Liberty For Prisoners

- **Article 21:**
 - The Supreme Court in various cases has declared the right to medical care comes under the ambit of Article 21 of the Constitution
 - Article 21 of the Constitution also guarantees the right to personal liberty and thereby prohibits any inhuman, cruel or degrading treatment to any person whether he is a national or foreigner.
- **Article 39A:**
 - Article 39A of the Constitution of India deals with the obligation of the State to **provide free Legal Aid to such accused prisoners both in the prison and outside**, as they are unable to engage a lawyer due to a lack of means to defend themselves in the Court for the criminal charges brought against them.

2. Bloomberg gender equality index

Section : Important Reports

Concept :

- Bloomberg has selected 484 companies for the 2023 Bloomberg Gender-Equality Index (GEI), from a fray of over 600, as recognition of the progress they have made in **promoting gender inclusion and implementing diversity policies**.
- Nine Indian companies have made it to this Index.
- The 600-plus participating companies had disclosed their gender-related data through what is called Gender Reporting Framework.

Gender-Equality Index

- The Gender-Equality Index (GEI) is a **modified market capitalization-weighted index** that aims to track the **performance of public companies committed to transparency in gender-data reporting**.
- By publicly releasing detailed, consistent and comparable gender-related data, the companies included in the Bloomberg Gender-Equality Index are setting a new standard for data reporting.
- The breadth of GEI member data is made available to the investment community on the Bloomberg Terminal.
- It includes disclosure by more than 600 companies, across developing and developed markets, and with depth that far surpasses the total data points made available by other providers.

3. Sachar panel report

Concept:

- The Rajya Sabha on Friday took up a **private member's resolution** urging the government to **implement the recommendations of the Sachar Committee** and other reports that have discussed educational and social backwardness of the Muslim community.

Sachar Committee

- The Sachar Committee was a **seven-member High Level Committee in India established in March 2005**.
- The committee was headed by former Chief Justice of Delhi High Court Rajinder Sachar.
- **Aim of the committee:** To examine the socio-economic and educational status of the Muslim community in India. The availability of data on religion was useful in highlighting the relative deprivation of minorities.
- The report highlighted a **range of disabilities faced by the Muslim community**.
- It placed Indian **Muslims below Scheduled Castes and Scheduled Tribes in backwardness**.
- It highlighted the huge mismatch between the percentage of Muslims in the population and in decision-making positions such as the IAS and IPS,
- It highlighted poor representation of the community in the police.

Main recommendations of the committee

- The Committee made a number of recommendations to address the status of the Muslim community in India, including:
- Set up an 'Equal Opportunity Commission' to look into grievances of deprived groups like minorities.
- Create a nomination procedure to increase the participation of minorities in public bodies.
- Establish a delimitation procedure that does not reserve constituencies with a high minority population for SCs.
- Increase employment share of Muslims, particularly where there is a great deal of public dealing. Work out mechanisms to link madrasas with the higher secondary school boards.
- Recognize degrees from madrasas for eligibility in defence, civil and banking examinations.

Private Members Bill /Resolution

- Any Member of Parliament (MP) who is **not a minister is referred to as a private member**.
- Its **drafting is the responsibility of the member concerned**.
- Its introduction in the **House requires one month's notice**. Whereas **government bill requires 7 days' notice**.
- The government bills/public bills can be introduced and discussed on any day, **private member's bills can be introduced and discussed only on Fridays**.
- In case of multiple Bills, a ballot system is used to decide the sequence of bills for introduction.
- The **Parliamentary Committee on Private Member's Bills and Resolutions** goes through all such bills/resolutions and classifies them based on their urgency and importance.
- Its rejection by the House has **no implication on the parliamentary confidence in the government or its resignation**.

4. Movement to get horizontal quota for transgender people

Concept :

- The central government **revealed in a reply in Parliament that it is not considering any proposal to provide quotas to trans people**.
- This move has been widely criticized by activists, scholars and lawyer fighting for the rights of transgenders.

Background

- Nearly nine years after the **Supreme Court's landmark National Legal Services Authority (NALSA) decision**, which **recognized transgender persons as a third gender** and issued directions to **protect their rights and dignity, public education for trans people**, the movement to secure horizontal reservation and employment is gathering momentum.
- It includes a legal battle that seeks to modify a part of the landmark 2014 judgement.
- The judgment directed the central and state governments to provide "all forms of reservation" to transgender people in admission to educational institutions and employment, but still not enforced.
- But since the judgment also calls for trans people to be treated as 'socially and educationally backward classes', which runs the risk of lumping them with the OBCs, the community is also demanding that separate trans reservations be ensured in all categories.

About Horizontal Reservation:

- **Horizontal Reservation refers to the equal opportunity provided to other categories of beneficiaries such as women, veterans, the transgender community, and individuals with disabilities, cutting through the vertical categories.**
- The **percentage of reservation allotted to Horizontal reservation** categories should be **adjusted against percentage of SC/ST/ OBC and General categories in vertical reservation.**
- It is also called as **Interlocking reservation.**
- Article 15(3) allows protective discrimination in favour of women.

Application of Reservations:

- The horizontal quota is **applied separately to each vertical category, and not across the board.**
- **For example**, if women have 50% horizontal quota, then half of the selected candidates will have to necessarily be women in each vertical quota category i.e., half of all selected Scheduled Caste candidates will have to be women, half of the unreserved or general category will have to be women, and so on.

5. India will emerge as a lighthouse for the world in the field of innovation: Rajnath Singh

Concept :

- Defence Minister Rajnath Singh on Wednesday expressed confidence that India will soon be among the leading countries in the field of innovation and emerge as the "lighthouse" to the entire world.
- Speaking after inaugurating the **annual defence innovation event 'Manthan' during Aero India** here, he said, if we want to bring the next generation industrial revolution, then we should either do new things or try to do the existing things in a new way.

Manthan Platform

- Organised by **Innovations for Defence Excellence (iDEX)**, the **Manthan platform** brings **leading innovators, start-ups, MSMEs, incubators, academia and investors** from the defence & aerospace ecosystem under one roof.
- **Innovation for Defence Ecosystem (iDEX)**
- **iDEX, launched in 2018**, is an **ecosystem to foster innovation & technology development in Defence and Aerospace** by engaging innovators & entrepreneurs to deliver technologically advanced solutions for modernizing the Indian Military.
- The Government has approved a **central sector scheme for iDEX** with **budgetary support of Rs. 498.78 crore** for the next 5 years from **2021-22 to 2025-26.**

Core Objectives:

- **Indigenization:** Rapid development of new, indigenized and innovative technology.
- **Innovation:** Creates a culture of engagement with innovative startups to encourage co-creation.
- It provides **funding/grants to MSMEs, start-ups, individual innovators, R&D institutes and academia** to carry out **research and development.**
- The **iDEX-Prime** aims to support **projects requiring support beyond Rs 1.5 crore up to Rs 10 crore**, to help ever-growing start-ups in the defence sector.
- iDEX is **funded and managed by "Defence Innovation Organisation"**.
- **iDEX portal** was launched to provide wider publicity and better visibility of iDEX activities and enable more efficient running of future challenges through better information management.

Defence Innovation Organisation (DIO)

- DIO is established by the **Department of Defence Production (DDP)** is aimed at promoting innovation and indigenisation in the aerospace and defence sector at the start-up level.
- DIO is a **not for profit organisation** formed under **section 8 of the Companies Act 2013.**
- It is funded by **Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL).**
- It provides **high-level policy guidance to iDEX.**

History

1. International theatre festival of Kerala

Section : Art and Culture

Concept :

- The International Theatre Festival of Kerala will turn Thrissur into a global stage.
- Music, art, and drama will be the central focus during this 10-day event.
- The **theme for this year's festival is 'Humanity Must Unite'**. Global events including the pandemic and the war in Ukraine will take the centre stage.
- With 10 international productions, 14 plays from across India, talks, discussions, workshops and art shows, the **festival is a celebration of theatre and a unique meeting place for theatre-makers and theatre-goers.**

International Theatre Festival of Kerala

- International Theatre Festival of Kerala (ITFoK) is an **international theatre festival held every year** in December in Thrissur city of Kerala State, India.
- The festival is organised by Kerala **Sangeetha Nataka Akademi and Cultural Department of Government of Kerala.**
- The **International Theatre Festival of Kerala (ITFoK) began in 2008** by Kerala Sangeetha Nataka Akademi under the leadership of late Murali (Malayalam actor) in Thrissur city.
- From world over independent, experimental and contemporary theatre groups participate in this festival.
- The festival is held in G.Sankara Pillai Cultural Complex in Thrissur city over eight days. The main stages are Murali Outdoor Theatre and K. T. Muhammed Regional Theatre.

2. Age of consent in India

Section : Modern India

- India's age of consent for sex is set at **18 years** under the Criminal Law (Amendment) Act, 2013, regardless of gender.
- **In 1892**, the marital rape and subsequent death of a 10-year-old girl, Phulmoni Dasi, caused **the age of consent to be raised from 10 to 12 years.**
- **In 1949, it was raised to 16 years** after agitation from women's groups about the adverse effect of early pregnancy.
- The Criminal Law (Amendment) Act, of 2013 increased the **legally permissible age for sexual consent from 16 to 18.**
- Although the Criminal Law (Amendment) Act, of 2013 initially sought to lower the age to 16, it was set at 18 due to political pressure from conservative parties.
- **Section 375 of the Act:** A man is said to commit "rape" if he has sexual relations with a girl less than 18 years of age with or without her consent.
- POSCO Act, 2012 disallows any such sexual relationships between people under 18 years of age and puts such crimes within marriages as an aggravated offence.
- An exception under the act; According to Section 375, Sexual Intercourse by a man with his wife, the wife not being under 15 years of age, is not rape.

History of child marriage

- From Rig Vedic period to modern times, child marriage is practiced throughout the country with religious sanctions.
- Hindu and Muslim Personal Laws do not explicitly prohibit child marriage.
- The **Rig Veda mentions garbhadhan** — literally, attaining the wealth of the womb. It is the first of the 16 samskaras a Hindu is expected to perform.
- The Greek traveller **Megasthenes (350-290 BC) has written** that he was told that the **women of the Pandian kingdom in South India bear children at six years of age.**
- About seven centuries later, the Persian polymath, **Al Biruni, wrote that child marriages were rampant in India.**
- The Muslim clergy too considered child marriages to be valid, though such children have the option to nullify their marriage.
- The colonial state should be credited for reforming marriage laws. **The Age of Consent Acts of 1861 and 1891 brought in reform in conjugal rights.**

Age of consent 1861

- The 1861 Act laid down 10 years as the minimum age for sexual intercourse. The Hindu intelligentsia opposed raising this age to 12 on the grounds that it violated norms related to garbhadhan.

Age of consent act 1891

- The Age of Consent Act, 1891 was a legislation enacted in British India on 19 March 1891 which raised the age of consent for sexual intercourse for all girls, married or unmarried, from ten to twelve years in all jurisdictions, its violation subject to criminal prosecution as rape.
- The sufferings of two young girls **Rukhmabai and Phulmoni Dasi** has led to this act.

- Tilak's newspapers **Maratha** and **Kesari** were at the forefront of this campaign.

Sarda Act

- The child marriage Restraint Act set the minimum age of marriage for women and men at 16 and 18 years respectively in 1929.
- This law is also known as the Sarda Act after its sponsor Harbilas Sarda, a judge and member of Arya Samaj.
- The Sarda Act was amended in 1978 to prescribe the age of marriage for a girl and boy as 18 and 21 years respectively.

3. Vijayanagara Kingdom

Section : Medieval History

Concept :

- Salman Rushdie's latest work, "**Victory City**" is a fictionalised telling of the story of Vijayanagara, one of the richest and most powerful kingdoms in mediaeval India.

About Vijayanagar Kingdom

- It was **founded in 1336 by Harihara and Bukka** (with the blessings of Guru Vidyaranya) of the Sangama dynasty who originally served under the Kakatiya rulers of Warangal.
- They later proclaimed their independence and founded a new city on the south bank of the Tungabhadra River **named it "Vijayanagar" (City of Victory)**
- Early Vijayanagar rulers were **followers of Saivism. Virupaksha was their family God.** Later they came under the influence of Vaishnavism. However, Siva continued to be worshipped.
- There was constant **conflict between Vijayanagar Empire and Bahmani kingdom** over Raichur doab (fertile region between Krishna and Tungabhadra), Tungabhadra doab (fertile areas of Krishna-Godavari delta) & Marathwada.
- In the south its **main rivals were the Sultans of Madurai.**
- **The kingdom reached its peak under Krishna Deva Raya (reign 1509-1529), a period in which it enjoyed military superiority to its rival kingdoms such as the Bahmani Sultanate, the Golconda Sultanate and the Gajapatis of Odisha.**
- During the reign of Rama Raya, the combined forces of Bijapur, Ahmednagar, Golkonda and Bidar defeated him at the **Battle of Talaiakotta in 1565** which marked an end of the Vijayanagar Empire.
- The last ruler of Vijayanagar was Sri Ranga III.

Dynasties of Vijayanagar Kingdom

Sangama(1336-1485)

- Sangama was the first dynasty to rule over the Vijayanagara empire. The founders of the empire, Harihar I and Bukka belonged to this dynasty. It ruled from 1334 AD to 1485 AD.

Saluva(1485-1505)

- Saluva dynasty, founded by Narasimha, succeeded Sangama dynasty as the second dynasty of the empire. It ruled from 1485 to 1505 AD. They ruled over almost the whole South India.

Tuluva(1505-1570)

- Tuluva, founded by Vir Narsimha, was the third dynasty, which ruled Vijayanagar Empire. It ruled from Tuluva dynasty. The most famous king of Vijayanagar Empire, Krishna Deva Raya belonged to this dynasty. It ruled from 1491 AD to 1570 AD.

Aravidu(1570-1650)

- Aravidu, founded by Tirumala, was the fourth and last Hindu dynasty to rule Vijayanagar kingdom in South India.

Administration

- The king enjoyed absolute authority in executive, judicial & legislative matters.
- The succession to the throne **was hereditary.**
- Administrative units divided as: **Mandalams, Nadus, Sthals and finally into Gramas.**
- **Mandaleswar or Nayaka** was the governor of Mandalam.
- He had considerable autonomy- had right to issue coins of small denominations & right to impose new tax or remit old one.
- **Sources of income:** land revenue, tributes, and gifts from vassals and feudal chiefs, customs at ports, & taxes on various professions.
- The army consisted of cavalry, infantry, artillery and elephants.
- **Nayakar System** – The top-grade officers of the army were known as Nayaks/Poligars.
- They were granted land in lieu of their services which were called
- **Manyams were tax free lands.**

- A body of 12 functionaries known as **Ayangars**, conducted village affairs.
- **Trade**
- While the economy of the kingdom was largely dependent on agriculture, trade thrived in its many ports on either coast.
- Traveller **Abd al-Razzaq Samarqandi** chronicled how the ports of **Mangalore, Honavar, Bhatkal, Barkur, Cochin, Cannanore, Machilipatnam**, and **Dharmadam** saw traders from **Africa, Arabia, Aden, the Red sea, China** and Bengal and also served as ship building centres.
- The empire's principal exports were pepper, ginger, cinnamon, cardamom, myrobalan, tamarind timber, anafistula, precious and semi-precious stones, pearls, musk, ambergris, rhubarb, aloe, cotton cloth and porcelain.
- Razzaq also chronicled the high degree of monetisation in the Vijayanagara kingdom. In his classic *History of South India*, K A NilakantaSastri wrote that coins were minted by the state as well as by merchant guilds using gold, silver, copper and brass, and their value depended on material weight.

Art and Cultural contributions

- Vijayanagara architecture is a vibrant combination and blossoming of **the Chalukya, Hoysala, Pandya and Chola styles**.
- The chief characteristics of the Vijayanagara architecture were the **construction of tall Raya Gopurams or gateways and the Kalyanamandapam** with carved pillars in the temple premises.
- The sculptures on the pillars were carved with distinctive features.
- The **horse** was the most common animal found in these pillars.
- The most important temples built: **Vittalaswamy and Hazara Ramaswamy temples, the Stone chariot at Hampi**.
- **Vijayanagara's capital Hampi is a UNESCO World Heritage Site today**, known for its sophisticated fortifications as well as innumerable temples and other architectural marvels
- The **Varadharaja and Ekamparanath** temples at **Kanchipuram**.
- **Different languages such as Sanskrit, Telugu, Kannada and Tamil** flourished in the regions.
- Vijayanagar has been remembered as an **era of "cultural conservatism"**, when **classical forms of Hinduism were preserved amidst growing Islamization** of the rest of the subcontinent, especially the North.

Foreign Travelers during the period

- Abu Abdullah/ IbnBatuta (Book:Rihla),Morocco – Harihara I
- Nicolo de Conti, Italy – Devaraya-II
- Abd al-Razzaq Samarqandi, Persia – Devaraya-II
- Athanasius Nikitin, Russia- Virupaksha Raya II
- Ludvico de Vortheima, Italy- Krishna Deva Raya
- Duarte Barbosa,Portugal – Krishna Deva Raya
- Dominigo Paes, Portugal – Krishna Deva Raya
- FernaoNuniz, Portugal – Achyuta Deva Raya.

4. Aligarh Muslim University (AMU)

Section: Modern INDIA

Concept:

- It grew out of the work of Sir Syed Ahmad Khan and the Aligarh Movement.
- It was founded as the **Madrasatul Uloom in 1875 in Aligarh** and evolved into the Mohammedan Anglo-Oriental College.
- In 1877, **Sir Syed founded the Muhammadan Anglo-Oriental College in Aligarh** and patterned the college after Oxford and Cambridge universities that he had visited on a trip to England.
- The objective was to build a college in tune with the British education system but without compromising its Islamic values.
- **AMU became a University in 1920**, through an **Act of Indian Legislative Council** by elevating the **Mohammedan Anglo Oriental (MAO) College to the status of a Central University**.
- The **University campus is located in the city of Aligarh, Uttar Pradesh**. It also has three off-campus centres in Malappuram (**Kerala**), Murshidabad-Jangipur (**West Bengal**) and Kishanganj (**Bihar**).

Contributions of Syed Ahmed Khan

- He started his career as a **civil servant and served the British before the revolt of 1857**.
- The 1857 revolt was one of the turning points in Syed Ahmed's life and he penned a pamphlet titled **"The Causes of the Indian Revolt"** to explain the reasons of the revolt from a "native perspective".
- He **supported the British** during the 1857 revolution.
- He raised voice against the **existing religious intolerance, ignorance and irrationalism** prevailing in the society at that time.
- He **denounced the orthodox systems of purdah, polygamy and easy divorce** of the Muslim community.
- **TahzebulAkhlq (Social Reformer in English)**, a magazine founded by him, tried to awaken people's consciousness on social and religious issues in very expressive prose.

- He instituted **the Scientific Society in 1863** to instill a scientific temperament into the Muslims and to make the Western knowledge available to Indians in their own language.
- He launched **The Aligarh Institute Gazette**, an organ of the Scientific Society in March 1866 and succeeded in agitating the minds in the traditional Muslim society.
- In **1875, Sir Syed founded the MadarsatulUloom in Aligarh** and patterned the **MAO College after Oxford and Cambridge universities** that he went on a trip to London. His objective was to build a college in line with the British education system but without compromising its Islamic values.

The Aligarh Movement:

- Sir Syed Ahmad Khan is best known for the **Aligarh Movement** a systemic movement aimed at **reforming the social, political and educational aspects of the Muslim community**.
- In **1886, he set up the Mohammedan Anglo-Oriental Education Congress** which was later renamed the Mohammedan Anglo-Oriental Educational Conference. It aimed to bring together education and culture.
- He also emphasised the need for an autonomous Muslim institution free of any government funding.
- It undertook to modernise Muslim's education by adapting English as a medium of learning and western education rather than just focusing on traditional teachings.
- The movement helped the Muslims revival and **gave them a common language Urdu**.

5. History of child marriage

Section :Modern history

Concept :

- From Rig vedic period to modern times, child marriage is practised throughout the country with religious sanctions.
- Hindu and Muslim Personal Laws do not explicitly prohibit child marriage.
- **Manusmritis:**
- It says that if the father fails to marry off his daughter within three years of her attaining puberty, she can find a spouse on her own.
- Medhatithi, one of the oldest and earliest commentators on the Manusmriti, eight years is the right age for a girl to be given in marriage
- The **Rig Veda mentions garbhadhan** — literally, attaining the wealth of the womb. It is the first of the 16 samskaras a Hindu is expected to perform.
- The Greek traveller **Megasthenes (350-290 BC)** has written that he was told that the **women of the Pandian kingdom in South India bear children at six years of age**.
- About seven centuries later, the Persian polymath, **Al Biruni, wrote that child marriages were rampant in India**.
- The Muslim clergy too considered child marriages to be valid, though such children have the option to nullify their marriage.
- The colonial state should be credited for reforming marriage laws. **The Age of Consent Acts of 1861 and 1891 brought in reform in conjugal rights.**
- **Age of consent 1861**
- The 1861 Act laid down 10 years as the minimum age for sexual intercourse.
- The Hindu intelligentsia opposed raising this age to 12 on the grounds that it violated norms related to garbhadhan.

Age of consent act 1891

- The Age of Consent Act, 1891 was a legislation enacted in British India on 19 March 1891 which raised the age of consent for sexual intercourse for all girls, married or unmarried, from ten to twelve years in all jurisdictions, its violation subject to criminal prosecution as rape.
- Tilak's **newspapers Maratha and Kesari** were at the forefront of this campaign, which was opposed to the age of consent act.

Background

- The sufferings of two young girls **Rukhmabai and PhulmoniDasi** has led to this act.
- **Rukhmabai case**
- In **1884, Rukhmabai, a 20-year-old woman** was taken to Bombay high court by her husband Bhikaji after she refused to live with him.
- Having married him at the age of 11 years, never having consummated the marriage and having lived separately for nearly 8 years she refused to move back with him.
- She was ordered by the court to live with her husband or face a six month imprisonment. She **refused to comply and the rising costs of the trial** forced Bhikaji withdrew the case in July 1888 upon a settlement of 2000 rupees.
- This trial was one of the precursors for the passage of this legislation.

PhulmoniDasi

- In 1889, the death of an 11-year-old Bengali girl **Phulmoni Dasi** after being brutally raped by her 35-year-old husband **Hari Mohan Maitee** served as a catalyst for its legislation.
- Hari Mohan Maitee was acquitted on charges of rape, but found guilty on causing death inadvertently by a rash and negligent act.

Sarda Act

- The Child Marriage Restraint Act, 1929 was also known as **Sarda Act**. The act was passed on 28 September 1929.
- As per the act the age of marriage for **girls was fixed at 14 years and for boys it was 18 years**.
- This law is also **known as the Sarda Act** after its sponsor **Harbilas Sarda**, a judge and member of **Arya Samaj**.
- **This act applied to the whole of the British India and the Princely states were exempted from the purview of this act.**
- The Sarda Act was amended in 1978 to prescribe the age of marriage for a girl and boy as 18 and 21 years respectively.

Joshi Committee and the act

- Various bills addressing questions on the age of consent were introduced in the Indian legislatures and defeated.
- The **Joshi Committee was formed for the purpose of recommending the age for marriage and consent for males and females in British India.**
- The All-India Women's Conference, Women's Indian Association and National Council of Women in India, through their members developed and articulated the argument in **favour of raising of the age for marriage and consent before the Joshi Committee.**
- Muslim women presented their views to the **Joshi Committee** in favour of raising the age limit of marriage even when they knew that they would face opposition from Muslim Ulemas.
- The **Joshi Committee presented its report on 20 June 1929** and was passed by the Imperial Legislative Council on 28 September 1929 and became a law on 1 April 1930, after **approval from Lord Irwin extending to the whole of British India.**
- It fixed 14 and 18 as the marriageable age for girls and boys respectively of all communities.

International law on child marriage

- Along with the Indian laws and constitutional provisions **modern international laws and conventions do mandate countries to stipulate a minimum legal age for marriage.**

Some of the conventions are:

- The **United Nations (UN) Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages (1962).**
- The **UN Convention on the Elimination of All Forms of Discrimination against Women (1979).**
- The **Beijing Declaration (1995).**

6. Appeal for cow hug day unconstitutional – AITUC

Section : Modern India

Concept :

- Leftwing trade union **All India Trade Union Congress (AITUC)** questioned the appeal of Animal Welfare Board of India (AWBI) to mark February 14 as 'cow hug day'.
- Terming it as shocking and outrageously appalling, the AITUC secretariat said the Centre approving such an appeal was all the more deplorable.
- The appeal was 'unconstitutional' as the Indian **Constitution stood for encouraging scientific temper**, it said and urged the Centre to immediately withdraw it.

All India Trade Union Congress (AITUC)

- The most important development in the workers' movement during independence struggle was the **formation of All-India Trade Union Congress under the leadership of Bal Gangadhar Tilak and Lala Lajpat Rai.**
- **It was formed in 1920 at Bombay.**
- Since then the working class movement became strong and by 1930 onwards, an ideological tone was added to the movement.

Cause of Formation:

- Many people connected with labour realised that there was a need for a central organisation of labour to coordinate the works of the trade unions all over India.
- The formation of the **International Labour Organisation (ILO) in 1919** acted as a catalyst for it.
- The **members selected from AITUC represented the Indian Labour at the ILO.**

Leaders Involved:

- **Bal Gangadhar Tilak, N.M.Joshi, B.P.Wadia, Diwan Chamanlall, Lala Lajpat Rai and Joseph Baptista** were the main leaders behind the formation of AITUC.
- Lala Lajpat Rai became the **first president of the AITUC** and Joseph Baptista its vice president.
- **Lajpat Rai** was the **first to link capitalism with imperialism**: “imperialism and militarism are the twin children of capitalism”.

Ideology of AITUC:

- In the beginning, the AITUC was influenced by social democratic ideas of the British Labour Party.
- The Gandhian philosophy of non-violence, trusteeship and class-collaboration had great influence on AITUC.
- Since 1945, the All India Trade Union Congress has been politically associated with the Communist Party of India.
- **Trade Union Act, 1926:**
- The act **recognised trade unions as legal associations**.
- It laid down conditions for registration and regulation of trade union activities.
- It secured civil and criminal immunity for trade unions from prosecution for legitimate activities, but also put some restrictions on their political activities.

Animal Welfare Board of India (AWBI)

- AWBI is a **statutory advisory body** under the **Union Ministry of Fisheries, Animal Husbandry and Dairying (Department of Animal Husbandry and Dairying)**
- It **derives its legal structure from the Prevention of Cruelty to Animals Act, 1960**.
- It was established in
- It was started under the **stewardship of Late Smt. Rukmini Devi Arundale**, well known humanitarian.
- Headquarters: **Chennai**
- **Mandate:**
- It frames rules on how animals ought to be humanely treated everywhere.
- It has also frequently litigated to have stricter laws to ensure animals were not unduly harassed or tortured.

Membership:

- Several government organisations, along with animal rights activists and parliamentarians, are represented on the Board.
- The Board consists of 28 Members.
- The term of **office of Members is for a period of 3 years**.

7. The Central Hall

Section: Art and Culture

- It is a place of historical importance.
- The transfer of power on the midnight of 14-15 August, 1947 from British to Indian hands took place in this Hall.
- The Indian Constitution was also framed in the Central Hall.
- The Central Hall is circular in shape and its dome which is 98 ft. (29.87 meters) in diameter is one of the most magnificent domes in the world.
- The Central Hall was originally used as the Library of the erstwhile Central Legislative Assembly and the Council of States. In 1946, it was converted and refurnished into the Constituent Assembly Hall.
- The Constituent Assembly met there from 9 December, 1946 to 24 January, 1950.
- At present, the Central Hall is used for holding Joint Sitzings of the two Houses.
- At the commencement of the first Session after each General Election to Lok Sabha and at the commencement of the first Session of each year, the President addresses Members of both the Houses of Parliament assembled together in the Central Hall.
- When the Houses are in Session, the Central Hall is used by Members for informal discussions among themselves.
- The Central Hall is also used for special occasions when the Members of Parliament are addressed by distinguished Heads of State of other countries.
- The Hall is also equipped with Simultaneous Interpretation System. The Hall has been upgraded with digital sound system. Overlooking the dais in the Centre of the Central Hall is the portrait of Mahatma Gandhi painted by Sir Oswald Birley and donated to the nation by Shri A.P. Pattani, a Member of the Constituent Assembly of India. Gilded panels on the walls and arches on either side of the dais carry portraits of the following distinguished national leaders: —
 - Dadabhai Naoroji
 - Lokamanya Bal Gangadhar Tilak
 - Lala Lajpat Rai
 - Motilal Nehru
 - Pandit Madan Mohan Malaviya
 - Sardar Vallabhbhai Patel
 - Deshbandhu Chittaranjan Das
 - Rabindranath Tagore

- Smt. Sarojini Naidu
 - Maulana Abul Kalam Azad
 - Dr. Rajendra Prasad
 - Pandit Jawaharlal Nehru
 - Subhas Chandra Bose
 - C. Rajagopalachari
 - Smt. Indira Gandhi
 - Dr. B.R. Ambedkar
 - Dr. Ram Manohar Lohia
 - Dr. Syama Prasad Mookerjee
 - Rajiv Gandhi
 - Lal Bahadur Shastri
 - Chaudhary Charan Singh • Morarji Desai
 - Swatantryaveer Vinayak Damodar Savarkar
 - Shri Atal Bihari Vajpayee
- There are also 12 gilded emblems on the wall of the Hall representing the 12 Provinces of undivided India. Surrounding the Central Hall are six Lobbies which are suitably covered and furnished. One Lounge is reserved for the exclusive use of lady Members, one for First Aid Post and one for Panel of Chairpersons of Lok Sabha. The Central Hall has six Galleries on its first floor. At the time of Joint Sitzings of the two Houses, the two Galleries which are towards the right of the dais are occupied by press correspondents, the one facing the dais is set apart for distinguished visitors and in the other three, the guests of the Members of the two Houses are accommodated.

8. Draft Geo-heritage Sites and Geo-relics (Preservation and Maintenance) Bill 2022

Section: Art and Culture

Concept :

- A draft Bill, aimed at protecting India's geological heritage that includes fossils, sedimentary rocks, natural structures, has raised alarm in India's geo-sciences and paleontology community.

Geo Heritage:

- **“Geoheritage”** is a generic but descriptive term **applied to sites or areas of geologic features with significant scientific, educational, cultural, or aesthetic value.**
- Geoheritage sites serve the public interest.
- Such sites are critical to advancing knowledge about natural hazards, groundwater supplies, soil processes, climate and environmental changes, evolution of life, etc.
- The **Geological Survey of India has declared 32 geo-heritage sites.** These include –
 - Siwalik Fossil Park, Himachal Pradesh;
 - Stromatolite Fossil Park, Jharmarkotra Rock Phosphate deposit, Udaipur,
 - Akal Fossil Wood Park, Jaisalmer.
- The delapidated state of many of these places shows the need for a geo-heritage Bill.
- **India is a signatory to the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage, adopted in 1972,** which recognises it has a “duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated in its territory”.
- Currently, there is **no legislation for the protection of geo-heritage sites in India.**
- Due to this, the sites are threatened with destruction due to decay, population pressure, and changing social and economic conditions.
- Hence, the Ministry of Mined introduced the draft Geo-Heritage Sites and Geo-relics (Preservation and Maintenance) Bill, 2022.

Key Features of the Draft Bill:

- **Declaration of Geoheritage sites :**
- The central government may declare a site as a geoheritage site of national importance.
- Geoheritage sites must contain features of geological significance, such as geo-relics or natural rock sculptures.
- Geo-relics are movable relics such as fossils or meteorites.
- **Protection of Geoheritage sites :**
- The draft Bill empowers the central government to acquire, preserve, and maintain geoheritage sites.
- Director General of the Geological Survey of India will be given powers for this purpose, such as surveying and excavation.
- Construction on these sites will be prohibited.

Protection of Geo-relics:

- The central government may declare that a geo-relic cannot be moved from its site, by notification, unless permitted by the Director General.
- The Director General may direct the acquisition of a geo-relic to protect it.

Offences & Penalties :

- Offences under the Bill include (i) destruction or misuse of a geoheritage site, (ii) illegal construction, and (iii) damaging or illegally moving a geo-relic.
- These offences are punishable with a fine of up to five lakh rupees or imprisonment of up to six months, or both.

Criticism of the Bill:

- The critics argue that all the authority w.r.t. geoheritage sites and geo-relics is being vested in the hands of the DG of the Geological Survey of India.
- As an alternative, the critics suggest that there needs to be a broader committee of experts from a wider range of institutions.
- This would mean that the interests and difficulties faced by researchers, who actually work in the field, are kept in mind.
- At present, the Bill has not been presented before the Union Cabinet by the Ministry of Mines. Only after an approval from the Union Cabinet, can the Bill be tabled in the Parliament.

9. History of Ladakh

Section: Modern History

Concept:

- Ladakh is a mountaneous region which is **sandwiched between Karakoram Range in North and Himalayan Range in the South.**
- It is **composed of two districts:**
- **Leh** – It is the 2nd largest district of India and it covers more than half of the area of Jammu and Kashmir.
- **Kargil** – It lies near Line of Control. Zaskar Range is a part of Kargil.

Ladakh through the History

- Ladakh was originally inhabited by people of Indo-Aryan and Tibetan descent.
- Historically the region included the valleys of Baltistan, Indus, and Nubra, besides Zaskar, Lahaul and Spiti, Aksai Chin, Ngari and Rudok.
- Located at the crossroads of important trade routes since ancient times, Ladakh has always enjoyed great geostrategic importance.
- At the **beginning of the first century AD, Ladakh was part of the Kushan Empire. Till the 15th century, it was part of Tibet and was ruled by dynasties of local Lamas.**

Dogras invasion:

- In 1834, Hindu Dogras (from Jammu, which is southwest of Ladakh) invaded it.
- The **Sikhs acquired Kashmir in 1819**, Emperor Ranjit Singh turned his ambition towards Ladakh. But it was **Gulab Singh, the Dogra feudatory of the Sikhs in Jammu**, who went ahead with the task of **integrating Ladakh into Jammu and Kashmir.**

Tibet invasion:

- In May 1841, Tibet under **the Qing dynasty of China invaded Ladakh** with the hope of adding it to the imperial Chinese dominions, leading to the Sino-Sikh war.
- However, the **Sino-Tibetan army was defeated, and the ‘Treaty of Chushul’ was signed** that agreed on no further transgressions or interference in the other country’s frontiers.

British suzerainty:

- After the **first Anglo-Sikh war of 1845-46**, the **state of Jammu and Kashmir, including Ladakh**, was **taken out of the Sikh empire and brought under British suzerainty.**
- **As a buffer zone:** The state of Jammu and Kashmir was essentially a British creation, **formed as a buffer zone where they could meet the Russians.**
- Consequently, there was an attempt to delimit what exactly was Ladakh and the extent of the state of Jammu and Kashmir, but it became convoluted since that area came under Tibetan and Central Asian influence.

Pakistan and China border dispute:

- Ladakh became a contested territory between the newly independent nations of India and Pakistan. In the early 1960’s a substantial area of eastern Ladakh was annexed by China.
- Due to increasing tensions between India and Pakistan, the Chinese invasion of Tibet in the 1950s, and their occupation of the Aksai Chin region in 1962, Ladakh has become one of India’s most important strategic zones.
- Strategic location and border disputes with Pakistan and China have assured a firm foothold for army presence since the past 50 years.

10. Lavani dance

Section: Art and Culture

Concept:

- NCP leader Ajit Pawar has directed members of his party to not organise raunchy public shows in the name of Lavani, a folk song-and-dance performance that is popular in Maharashtra.

Lavani folk art form

- The word Lavani comes from ‘lavanya’ or beauty.
- Lavani is a **traditional folk-art form** in which **women dancers** wearing **nine-yard-long sarees** in bright colours, make-up, and ghunghroos **perform on dholak beats on a stage before a live audience**.
- As an indigenous art form, Lavani has a history going back several centuries, and it attained particular popularity in the **Peshwa era in the 18th century**.
- Traditionally, performances were held in front of kings or lords, and for the entertainment of tired soldiers resting during breaks in fighting.

Genres of Lavani

- There are several types of Lavani, of which the **most popular is the Shringarik** (erotic) kind, in which the lyrics are often teasing, with sensuous dance steps and delicate gestures employed to convey erotic meaning.
- Over the years, Lavani has gained more acceptability among the people, even though certain taboos around it continue.
- The audience has historically been all-male, but in recent years, some women too have begun to attend performances.

Reasons for the controversy

- **Lost its original form:** Some also argue that the commercialization of Lavani has led to a loss of authenticity and cultural significance.
- **Objectifying women:** The criticism of Lavani dance centres on the traditional dance form’s alleged objectification and commodification of women’s bodies.
- **Public obscenity:** It has been accused of promoting obscenity and vulgarity and reinforcing patriarchal attitudes towards women.
- **Communalizing/Stereotyping:** Critics have also argued that the dance form perpetuates negative stereotypes of women from marginalized communities, such as the notion that Dalit women are “loose” or sexually promiscuous.

11. Anti-encroachment drive in historic city of Mehrauli

Section: Medieval India

Concept:

- The Delhi Development Authority (DDA) carried out an anti-encroachment drive in the nearby villages of Mehrauli and Ladha Sarai leaving hundreds of families in uncertainty about their future.
- **History of Delhi**
- Purani Dilli, commonly referred to as Old Delhi, is a misnomer as the **city’s history dates back to before the establishment of Shahjahanabad**.
- The oldest evidence of habitation in Delhi, **dating back to the Iron Age (around 1100-800 BC)**, is the **painted grey ware fragments** found in **Purana Quila**.
- Historians recognize **seven cities of Delhi**, from the **11th century onwards**, namely **Lalkot/Quila Rai Pithora/Mehrauli, Siri, Tughlaqabad, Firozabad, Shergarh (Old Fort), Shahjahanabad, and New Delhi**.
- However, depending on what is considered a city, this number can be as high as 11.

City of Mehrauli

- **Mehrauli** is widely **considered to be the oldest ‘city’ of Delhi** and is the oldest area of the metropolis to be continuously inhabited.
- It was first **built by a ruler called Anangpal II in the 11th century**, and it was called Lalkot.
- Later, it was known as ‘**Quila Rai Pithora**’ and was **fortified by the Chauhans**.
- This was christened ‘**Quila Rai Pithora**’ by Mughal court historian **Abu’lFazl in his epic hagiography, ‘Ain-i-Akbari’**.
- The **Mamluk dynasty took control of the city in 1192**, and **QutubudinAibak, the first ruler of the dynasty, built the Qutub Minar and the Quwwat-al-Islam mosque** (oldest mosque in North India).
- In the following century, more buildings like tombs, step wells, palaces, and fortifications were constructed during the reigns of Iltutmish, Razia Sultan, and Alauddin Khilji.

Continued relevance and inhabitation

- Even as the newer cities came up and the seat of power shifted northwards, Mehrauli witnessed **building activity as late as the Mughal and British periods**.
- Due to its location on the lap of the Aravallis hills, the area was preferred as a summer retreat.

- **Two Mughal summer palaces (Zafar Mahal and Jahaz Mahal)** and a summer abode of Sir Thomas Metcalfe (Dilkhusha) are situated here.
- Mehrauli lay on a **historic trade route**, as the number of sarais (**Ladho Sarai, Ber Sarai, Neb Sarai**) around the area would suggest.
- Note : **A sarai was a resthouse for weary travellers.**

Cultural significance of Mehrauli

- Mehrauli is also a spiritual centre.
- Sufi saint **Hazrat Qutubuddin Bakhtiar Kaki (1173 -1235 AD)** was buried in the city and his dargah remains popular till date, across religious lines.
- Some historians cite the dargah as a reason for the city surviving the test of time – despite power shifting elsewhere, the dargah remained a revered destination for pilgrims far and wide.
- Historian Rana Safvi, in her book, ‘Where Stone Speaks’ talks about **Sultan Jalaluddin Khilji’s (1290-1296)** contribution to **building the bazaar (market) in Mehrauli.**
- Some of the markets still exist, though much smaller.
- Another spiritual centre for the community is the **Yogmaya mandir**, believed to be one of the oldest in the city.
- **Yoginis (semi-divine deities)** have been an **integral part of Indian folklore and this temple dedicated to them** is believed to have been **constructed by the Pandavas.**
- **‘Phool Walon ki Sair’ Festival :**
- The cosmopolitan spirit and secular heritage of Mehrauli are perhaps best expressed in the annual community celebration of **‘Phool Walon ki Sair’ or Sair-e-Gulfaroshan (walk of the flowers).**
- This **19th-century Mughal-era festival** was revived in 1962 by India’s first prime minister, Jawaharlal Nehru, and has become the symbol of the city’s communal harmony since then.
- The **three-day festival includes processions and festivities led by shehnai players and dancers.**
- An offering of **pankhas**(large floral fans) is made to the **Yogmaya Temple** and a **chadar** is offered at the **dargah of Khwaja Bakhtiyar Kaki.**

Encroachments

- Like much of the rest of Delhi, the Partition brought many changes to Mehrauli too.
- Many refugees from the West found sanctuary here. The city has also seen sectarian tensions.

12. Contributions of Annie Besant

Section :Personalities

Concept :

- Annie Besant, born on **October 1, 1847, in Ireland**, was a **well-known political activist**, freedom fighter, and supporter of the anti-Church movement and women’s rights.
- In the **1870s**, **Besant joined the National Secular Society and the Fabian Society**, both of which advocated for freedom of thought and liberation from the tyranny of the Catholic Church in England.
- Besant **traveled to India for the first time in 1893** and later settled there, becoming involved in the Indian nationalist movement.
- She founded the Indian Home Rule League, of which she later became president, in 1916. She was also a key figure in the Indian National Congress.

Background:

- Annie Besant was **born in London to an Irish-origin family as Annie Wood.** Besant’s father died when she was five years old, leaving her family impoverished.
- She married a vicar, Frank Besant, when she was 20 years old. They had two children but divorced legally due to religious differences.
- Besant was a **staunch supporter of Irish independence.**
- She also began to question her religious beliefs. She **went so far as to criticize the Church of England.** She was a **feminist political and religious activist**, which caused her problems in society.
- She advocated for **intellectual freedom, secularism, women’s rights, birth control, workers’ rights, and Fabian socialism.** She was particularly opposed to the church meddling in people’s lives.
- After meeting Helena Blavatsky in 1889, **Besant became a Theosophist.**
- Her search for socialist movement and spiritual solace led her to the Theosophical Society. During her time as a member of society, she developed an interest in Hinduism and its spiritual ideals.
- From **1907 to 1933, Annie Besant served as the society’s president.**
- A few days after arriving in India, she was inspired by the ongoing struggle for independence against British rule and gradually became an active participant in it.

Annie Besant – Role in India’s Independence

- In 1902, Annie Besant wrote that “India was not ruled for its benefit, but rather for the benefit of its conquerors.”
- She promoted national awakening while combating social ills such as caste discrimination and child marriage. She devoted a lot of time and effort to improving education in India.
- Annie Besant **entered politics when she joined the Indian National Congress**. When she first joined, the Congress was merely a debating body whose members deliberated on which resolutions to pass.
- These resolutions were mild in nature, requesting more representation for middle-class Indians in the British government. It had yet to grow into a mass movement demanding complete independence.
- When World War I broke out in 1914, Britain enlisted the help of its colonies against its adversaries. But, according to Annie Besant, this was where India’s opportunities lay.
- Annie Besant founded **the All India Home Rule League in September, 1916 (Tilak home rule league was formed in April 1916)**. This was India’s first faction to demand complete independence. The league worked all year to establish a network of local branches and organize agitations.
- The colonial authorities, for their part, placed her under house arrest as a result of her activities. Other political parties threatened more riots if she was not released.
- As a result, the government was forced to **make minor concessions. One of them was that once the war was over, the possibility of self-rule would be considered.**
- In **September 1917, Annie Besant was released**. In December of that year, **she was elected president of the Indian National Congress for a one-year term.**
- The new Congress leadership would be handed over to Mahatma Gandhi at this time. He was a key supporter of her release from house arrest.
- Annie Besant would fight for India’s independence until the end of her life. She would go on speaking tours in India and abroad to spread the word about the independence movement.

Educational Reforms

- Annie Besant advocated for research into ancient Indian religions, philosophies, and doctrines.
- She also founded the **Central Hindu School in 1898 at varanasi, to promote education.**
- **Later it has become the Banaras Hindu University with the efforts of Madan Mohan Malaviya in 1916.**
- **By 1918**, she had founded the following:
 - Madras Parliament
 - Madanapalle College (now in Andhra Pradesh)
 - Adyar Arts League
 - Bombay Home Rule League
 - Girls’ College in Benares
 - Order of the Brothers of Service
- **She is one of the founders of Women’s Indian Association in 1917** — from which grew the **All-India Women’s Conference in Poona (now Pune) in 1927** and the **Women’s Indian Association at Adyar.**
- Unfortunately, **she fell out of favor with the Indian National Congress due to her opposition to Gandhi’s non-cooperation and civil disobedience** agenda, which she saw as a threat to the rule of law.
- Despite her admiration for Gandhi as a man who lived a life guided by honesty and compassion, she advocated for constitutional methods of bringing about democratic change.
- Gandhi’s policies were implemented, and the disasters she had predicted occurred across India. Despite becoming unpopular and losing her political status, she continued to work for India.
- Annie Besant **remained a member of the Theosophical Society until she fell ill in 1931**. She passed away on **September 20, 1933**, at the age of 85, in Adyar, Madras Presidency

13. French Invasion of Russia

Section: World History

Concept:

- Russia asked French President Emmanuel Macron to remember the fate of Napoleon Bonaparte, after he called for Russia’s defeat against Ukraine.
- It also accused the president of being duplicitous in his diplomacy with Moscow.

French Invasion under Napoleon Bonaparte

- After winning the **battle of Friedland in 1807**, **Napoleon signed the Treaties of Tilsit with Russia’s Tsar Alexander I.**
- It marked the beginning of an alliance between the two empires as they agreed to help each other in disputes.
- Notably, the Russians also accepted to become part of Napoleon’s Continental Blockade, which prohibited both neutral parties and French allies from trading with Great Britain.
- Tsar broke the agreement in 1810 and start trading with Britain openly, much to France’s displeasure. Tensions escalated quickly and when all the attempts of negotiations failed.

- The **French invasion of Russia**, also known as the Russian campaign, the **Second Polish War**, the **Army of Twenty nations**, and the **Patriotic War of 1812** was launched by Napoleon to force the Russian Empire back into the continental blockade of the United Kingdom.

Course of war

- When the France army reached the Russian territory, the Tsar's army retreated into the interior regions, compelling the French to cover much longer distances than expected.
- This led to a shortage of food and other supplies. Napoleon's military strategists also realised that restocking was a daunting task in Russia because it had a poor road network.
- Moreover, food scarcity was made worse by Russian soldiers, who adopted a **scorched earth policy of destroying everything possible as they retreated** before the French.
- After the Tsar refused to respond to any of Napoleon's proposed negotiations for weeks, the French emperor begrudgingly ordered his men to return.
- By the time the army crossed into Poland in early December, less than 100,000 exhausted, tattered soldiers remained of the 600,000 proud soldiers who crossed the Nieman five months before.

Consequences of the war

- Napoleon's failed conquest of Russia **united the rest of Europe against him**.
- **In 1813**, Austria, Prussia, Russia, Spain, the United Kingdom, Portugal, Sweden and a number of German states joined their forces and went to war against France.
- Known as the **War of the Sixth Coalition**, the battle concluded with the defeat of Napoleon, who then went into exile.
- He briefly **returned to power in France in 1815** but had to abdicate his throne for the second time **after he lost the Battle of Waterloo during the War of the Seventh Coalition**.
- Napoleon was exiled to the remote island of Saint Helena in the Atlantic, where he died in 1821.

14. Survey of India

Section : Art and Culture

Context: The Survey of India (SoI), India's **250-year-old map maker (as of 2017)**, while no longer having a monopoly on making high resolution maps, **will remain the arbiter of maps that deal with State borders and national boundaries** says Sunil Kumar, Surveyor General of India and Joint Secretary, Ministry of Science and Technology.

More in news:

- In December **2022**, the Centre officially released the **National Geospatial Policy of India** that **allows any private agency to make high resolution maps**.
- Before this, the Survey of India made various categories of maps that, while available for nominal charges, were relatively hard to access. Moreover, maps made for "civilian purposes" were coarser than the "defence series maps" that were more detailed but only accessible to the Defence Ministry.
- The **SoI will continue to maintain CORS** (Continuously Operating Reference Stations) that are necessary to create accurate digital maps to cartographers. A CORS consists of a GPS receiver operating continuously, and a stable antenna for continuously streaming raw data.

Concept:

Survey of India:

- **Origin:** 1767, Major **James Rennell** was appointed as the **Surveyor General of Bengal**.
- It is the **oldest scientific department** in India and one of the oldest survey establishments in the world.
- Foundation for the scientific survey and mapping of the country was laid with **The Great Trigonometric Survey** in the 19th C by noted surveyors **Col Lambton** and **George Everest**.
- It has played an indispensable pioneering role in understanding the country's priorities in growth and Defense and was **pivotal** in the foundation of almost all **major developmental activities of the modern India**.
- It looks forward to **create a new era of geospatial evolution** which would facilitate India to achieve future economic milestones **along with Sustainable Development Goals**.
- Significant Developments include:
 - 1787: 1st Indian survey based on Triangulation system conducted from Madras to the Southern Peninsula
 - 1843: Measurement of the Great Arc from Cape Comorin to the Himalayas completed
 - 1849: Height of Highest Himalayan peak Mt. Everest (computed by RadhanathSikdar)

National Geospatial Policy,2022:

- It is a **citizen-centric policy** that seeks to strengthen the Geospatial sector to support national development, economic prosperity and a thriving information economy.

- The policy has divided **14 Geospatial Data Themes** to support the development of commercial geospatial applications in various sectors e.g., disaster management, mining, forestry etc.
- Some of the major Goals include:

2025	2030	2035
-an enabling policy and legal framework that supports liberalization of Geospatial sector and democratization of data for enhanced commercialization with Value Added Services.	<p>–High resolution topographical survey & mapping (5-10 cm for urban & rural areas and 50 cm-100 cm for forests & wastelands).</p> <p>–High accuracy Digital Elevation Model (DEM) for entire country (25 cm for plain, 1-3 metre for hilly and mountainous areas).</p> <p>–Develop a Geospatial Knowledge Infrastructure (GKI) underpinned by Integrated Data and Information Framework</p>	<p>–High resolution/accuracy Bathymetric Geospatial Data of inland waters and sea surface topography of shallow/deep seas – to support Blue Economy.</p> <p>–National Digital Twin of major cities and towns.</p>

15. 900-year-old parrot lady relives journey from Canada

Section: Art & Culture

Context: At Maharaja Chhatrasal Convention Centre, Khajuraho, Madhya Pradesh, an exhibition titled ‘**Re(ad)dress: Return of Treasures**’ was inaugurated.

More in the news:

- The exhibition is **part of the first G20 Culture Working Group (CWG)**
- The exhibition comprises **26 artefacts** that have returned to the country after being stolen from India and smuggled abroad and their cultural biographies. The ‘**Parrot Lady**’, a **sandstone sculpture from Khajuraho**, is among the 26 artefacts on display.
- Others include: the **12th-century Dancing Ganesha**, a stone sculpture from **central India** that went missing but was repatriated from the US in 2021; the **11th-century marble sculpture of Brahma and Brahmani from Gujarat**, repatriated from the UK in 2017; and the **Yaksha, Amin Pillar from 2nd century BC**, which went missing from Haryana, but was later discovered in the UK and repatriated in 1979-80.
- The **objective** of the meet is to **achieve a reduction in illicit trafficking of cultural property by 2030**, strengthen regulation of online trading platforms and also create awareness about restitution laws and conventions and highlight successful case studies.
- The exhibition is conceptualised in **six thematic sections**: cultural heritage, repatriation of cultural property, historical precedents, conventions and guiding principles, global cooperation and glimpses of the return.

Concept:

- The **ASI** was also a **nodal agency to retrieve stolen or illegally exported** art objects. From 1976 to 2001, 19 antiquities had been retrieved by the ASI from foreign countries either through legal means, indemnity agreement, voluntary action or through out of case settlement. But **after 2001, the ASI had not been able to achieve any success due to discretion and abuse** in granting non-antiquity certificates for exports.
- **India is a signatory to the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property** (ratified it in 1977).
- Perhaps there is a **need to sign the 1995 UNIDROIT** (International Institute for the Unification of Private Law) Convention on Stolen or Illegally Exported Cultural Objects.
- **Steps taken by India to preserve and conserve monuments and antiquities include:**
 1. **Article 51 A (f)**–“It shall be the duty of every citizen of India to value and preserve the rich heritage of our composite culture.”
 2. **Article 49**–to protect monuments, places and objects of national importance.
 3. **Ancient Monuments and Archaeological Sites and Remains (AMASR) Act of 1958**
 4. **AAT (Antiquities and Art Treasures) Act, 1972**– to effectively control movable cultural property consisting of antiquities and art treasures.
 5. **Antiquities Export Control Act, 1947** – regulate the export of antiquities

6. **National Mission on Monuments and Antiquities, 2007**– prepare a national register to document antiquities from different sources in a uniform format.
7. **India Pride Project**– Volunteer network spread across globe that tracks and brings India's stolen antiquities and art treasures.

16. Kerala Mural paintings

Section : Art and Culture

Concept :

- Pooja Kashyap, a noted artist in Kerala Mural Paintings, who teaches History at Delhi's Gargi College is exhibiting 30 of her works in acrylic paint, this week at the All India Fine Arts and Crafts Society (AIFACS).

Kerala Mural Paintings

- **Kerala painters (16th to 18th century)** evolved a **pictorial language and technology of their own** while discriminately adopting certain stylistic elements from Nayaka and Vijayanagara schools.
- It is one of the **Later Mural traditions** in India.
- **Later Mural Traditions**
- Even after Ajanta, very few sites with paintings have survived which provide valuable evidences to reconstruct the tradition of painting.
- The sculptures too were plastered and painted and the tradition of cave excavation continued further in many places where sculpting and painting were done simultaneously.
- The painters evolved a language **taking cues from contemporary traditions like Kathakali and Kalam Ezhuthtu** using vibrant and luminous colours, representing human figures in three dimensions.
- Most of the paintings are seen on the **shrine walls, cloister walls of temples and some inside the palaces.**
- Thematically too, paintings from Kerala stand apart.
- Most of the narrations are based on those episodes from Hindu mythology which were popular in Kerala.
- The artist seems to have derived sources from oral traditions and **local versions of the Ramayana and the Mahabharata for painting narrations.**
- Apart from the Mahabharata, Ramayana, and The Gita, some texts that inspire these paintings include **15th Century Tantrasamuchhaya on temple architecture by Narayana, 16th Century Shilparatna by Sreekumara, Kumara-sambhava by Kalidasa.**
- More than 60 sites have been found with mural paintings.
- The important palaces where mural paintings can be found are :**Dutch Palace, Kochi, Krishna Puram palace, Kayamkulam and Padmanabhapuram palace.**
- The mature phase of Kerala's mural tradition can be seen at **Pundareekapuram Krishna Temple, Panayanarkavu, Thirukodithanam, Tripayar Sri Rama temple and Thrissur Vadakkunnatha temple.**

17. Keeladi Findings

Section : Art and Culture

Concept :

- Recently, the **Archaeological Survey of India (ASI)** has submitted a detailed report on the findings during the first two phases of the digging at the Sangam-era site and their significance.
- Also, the **Keeladi Site Museum** is coming up in Sivaganga that would house significant ones of the over 18,000 artefacts unearthed so far.

About Keeladi

- **Keeladi is a tiny hamlet in the Sivaganga district** in south Tamil Nadu. It is about 12 km south-east to the temple city of Madurai and is located along the Vaigai river.
- The excavations here from 2015 prove that an **urban civilization existed in Tamil Nadu** in the **Sangam age** on the **banks of the Vaigai river.**

What are the Key Findings?

- In the eight rounds of excavations, including the first three by the ASI, **over 18,000 artefacts have been unearthed** from the site and the unique artefacts will be on display at the museum to be opened soon.
- **Unearthing of heaps of pottery** suggest the **existence of a pottery making industry, mostly made of locally available raw materials.** Over 120 potsherds containing **Tamil Brahmi inscriptions** have been found.
- Over a thousand inscribed potsherds, found at Keeladi and other sites clearly suggest the long survival of the script.
- **Spindle whorls, copper needles, terracotta seal, hanging stones of the yarn, terracotta spheres and earthen vessels** to hold liquid suggest various **stages of a weaving industry.** There also existed a **dyeing industry** and a **glass bead industry.**

- **Gold ornaments, copper articles, semi-precious stones, shell bangles, ivory bangles and ivory combs** reflect the artistic, culturally rich and prosperous lifestyle of the Keeladi people.
- **Agate and carnelian beads** suggest **import through commercial networks** while terracotta and ivory dice, gamesmen and evidence of hopscotch have been unearthed revealing their pastime hobbies.

Significance of the Findings

- **Linkages with Sangam Age:**
- The **Sangam age is a period of history in ancient Tamil Nadu** which was believed to be from the **3rd century BCE to the 3rd century CE** and derives its name from the renowned Sangam assemblies of the poets of Madurai from that time.
- A recent ASI report has **pushed the Sangam age to 800 BCE** based on these archaeological findings.
- Keeladi could also provide crucial evidence for **understanding the missing links of the Iron Age** (12th century BCE to sixth century BCE) **to the Early Historic Period** (sixth century BCE to fourth century BCE) and subsequent cultural developments.
- **Potential Linkages with Indus Valley:**
- The unearthed Keeladi artefacts have led academics to describe the site as part of the **Vaigai Valley Civilization**. The findings have also invited comparisons with the Indus Valley Civilization while **acknowledging the cultural gap of 1,000 years between the two places**.
- The gap is filled with **Iron Age material in south India, which serve as residual links**.
- According to Tamil Nadu State Archaeology Department (TNSDA) **Keeladi has all the characteristics of an urban civilization**, with brick structures, luxury items and proof of internal and external trade.
- It comes across as an industrious and advanced civilization and has given evidence of **urban life and settlements in Tamil Nadu during the Early Historic Period**.

18. Union govt to mark SanthSevalal Maharaj Jayanti

Section: Art and Culture

Concept :

- The Union government on Sunday kicked off year long celebrations to mark **the 284th birth anniversary of SanthSevalal Maharaj**, a spiritual and religious leader of the Banjara community.

SanthSevalal Maharaj

- He is considered a **social reformer and spiritual teacher** of the **Banjara community**.
- He travelled across the country with his Ladeniya Troup to serve especially the forest dwellers and nomadic tribes.
- Due to his extraordinary knowledge, **excellent skills and spiritual background in Ayurveda and Naturopathy**, he was able to dispel and eradicate myths and superstitions prevalent in the tribal communities.

Banjara Community:

- Banjara is **made of various groups** found **throughout India** and most of them are found in **Telangana, Andhra Pradesh and Karnataka** states in South India.
- This community settled across the country with different names, have permanently abandoned their nomadic lifestyle and settled in their settlements called Tandas.
- They **speak GorBoli also called Lambadi** which belongs to the Indo-Aryan Group of Languages. **Lambadi has no script**.
- Banjara people celebrate the **festival of Teej during Shravanam**(in the month of august). In this festival young unmarried Banjara girls pray for a good groom.
- **Fire dance and Chari are the traditional dance forms** of the banjara people.

19. 150th Anniversary of Calcutta trams

Section : Culture

Concept:

- Kolkata's iconic tram service celebrated 150 years since the first tram was flagged off.
- The celebration saw tram enthusiasts from as far away as Germany and Australia come to the city for a **historic "Tramjatra" festival**, organised by the West Bengal Transport Department.

History of trams

- the first trams entered service in the then British capital of Calcutta in 1873. The horse-drawn trams plied on a 3.8 km route between Sealdah and Armenian Ghat Street.
- In 1874, the first horse-drawn trams emerged in Mumbai, plying on two routes – Colaba to Pydhonie via Crawford Market, and Bori Bunder to Pydhonie.
- Nasik would be the third city in India which saw trams – a four-horse-driven tram (with two cabins) that would travel a distance of around 8 km.

- In 1880, trams re-emerged in Calcutta, when Lord Ripon inaugurated a new, longer, metre-gauge route, this time with steam locomotives.
- However, Mumbai, Nasik or Patna would never switch to steam locomotives.
- Forest trams were opened in Cochin in 1907 and later in princely state of Bhavnagar in 1926.
- Electric trams : In 1895, Madras (present-day Chennai) saw India's first electric tramways enter service with seven cars and it was later introduced in Calcutta.
- By the 1960s, tramways, which were once seen as a revolutionary development in urban transport, had all but vanished in India. **Today, Kolkata remains the last city which still operates trams, though these old colonial relics are perpetually at risk of being discontinued.**

Tramjatra Event

- Tramjatra (tram's journey) is a **moving tram carnival that was started back in 1996** jointly by enthusiasts from **Melbourne and Kolkata.**
- At the time, Kolkata, the only Indian city where the tram still runs, was home to about two dozen routes.
- Today the number of routes that remain operational has shrunk to just two.
- The 2023 event, therefore, will be more about impressing the West Bengal government to preserve the tram.
- **Tramjatra is essentially an international collaboration** of trammies, artists, environmentalists, and tram-loving communities.
- It seeks to educate people, particularly the younger generation, about climate change, air pollution, and sustainable development objectives with a focus on green mobility and Kolkata's tram legacy.

20. 1300-year-old Buddhist stupa found in Odisha's Jajpur

Section: Art and culture

Concept :

- The Archaeological Survey of India (ASI) has found a **1,300-year-old stupa in the middle of a mining site in Odisha's Jajpur district from where Khondalite stones were excavated** for the project around the Jagannath Temple in Puri.
- According to preliminary analysis, the **stupa is 4.5 metres tall and may belong to the 7th or 8th century.**
- This stupa was **found at Parabhadi situated near Lalitagiri**, which was a **major Buddhist complex, having a large number of stupas and monasteries.**
- Post the discovery of the Buddhist stupa from the mining site, the ASI intervened and asked the Odisha government to stop mining in the location.
- The ASI would now try to fully retrieve the structure's archaeological heritage, restore it to its original form and undertake the protection of the site.
- Experts opine that the State government must conduct a heritage assessment of a site when it is located near any place of archaeological interest, before giving permission for mining as the destruction of smaller artefacts such as stupas cannot be restored if destroyed.

Khondalite stones:

- They were widely **used in ancient temple complexes.**
- The State government had come up with an ambitious plan to spend ₹3,208 crore under the **Augmentation of Basic Amenities and Development of Heritage and Architecture (ABADHA) scheme** in three years to transform Puri into a world heritage city.
- Khondalite stones are proposed to be used widely to maintain aesthetic value of some projects such as the heritage security zone, the Jagannath Ballav pilgrim centre, Puri lake development project, the Atharnala heritage project and the Matha Development Initiative.
- **Controversy**
- After discovery of the Buddhist stupa from the mining site, the ASI intervened and asked the Odisha government to stop mining through its Odisha Mining Corporation (OMC). The mining has since stopped.
- **Sukhuapada** was the biggest of six Khondalite stone blocks reserved for the OMC.
- With the ASI taking control of Sukhuapada site, the OMC may find it difficult to supply Khondalite stones for the State government's ambitious temple development programmes.
- It may trigger another round of confrontation between the Centre and the State government. Violation of the ASI guidelines was a major controversy surrounding the redevelopment project in Puri.

International Affairs

1. Mukaab City

Section : Places in news

Concept :

- Saudi Arabia's Crown Prince unveiled **The Mukaab, which is a 400-meter-high, wide, and long long indoor supercity in the center of Riyadh**
- The Mukaab, the super city, will be large enough to hold 20 empire state buildings and it is aimed that the **PIF-backed giga-project** will become a **new global icon of technology, sustainability, mobility, and Saudi Innovation.**
- The Mukaab will be in the center of the Wider New Murabba Development created by His Royal Highness **Crown Prince Mohammad bin Salman bin Abdulaziz**, Prime Minister and Chairman of the New Murabba Development Company (NMDC) to bring the project to fruition.

Mukaab Indoor Super-City is Saudi Arabia's Next Mega-Project in Riyadh- Key Features

- The **Public Investment Fund** of Saudi Arabia has announced the **project Mukaab** which is aimed to be the **world's largest modern downtown in Riyadh.**
- The Mukaab, is a **cube-like city** that will form the **centerpiece of a new downtown area in Riyadh.**
- The establishment of Mukaab aims to transform a 19-square-kilometer area to the northwest of Riyadh into a new gen mixed-use district.
- The development team of Mukaab confirms that the super city will offer ever-changing environments using digital and virtual technology to create holographic displays.

Aim of the project Mukaab and Structure

- The Mukaab, the super city, is **based on the Najdi architecture with more futuristic approach.**
- The building will enclose a tower on top of a spiral base. The structure will feature two million square meters of floor space that will be a hospitality destination with retail, cultural, and tourist attractions, featuring residential and hotel units, commercial space, and recreational facilities.
- The Mukaab, a new Murabba project will feature 1,04,000 residential units, 9000 hotel rooms, 9,80,000 square meters of retail space, and 1.4 million square meters of office space. It will also include a green area and walking paths to promote a healthy lifestyle.
- The developers informed that the project would create more than 340,000 jobs and the Mukaab project is scheduled to be completed by 2030.

Is the structure inspired by the Kaaba?

- However, the Saudi Arabia government has come under criticism from certain people who consider the planned Mukaab to closely resemble the Kaaba.
- The **Kaaba, located in Mecca, the holiest city for Muslims, is a black cuboid structure** considered to be the **most sacred site in all of Islam.**
- Every year, millions of pilgrims from across the world flock to **Mecca for the Hajj pilgrimage** where they circumambulate around the Kaaba.

Najdi Architecture

- It is one of the Arabian architectural styles, developed in the Saudi Arabian region
- The Najdi Architecture of Saudi Arabia **doesn't employ arches and domes both for structural as well as symbolic reasons.**
- **For example**, Qasr-al-Masmak is the fortress in the old city of Riyadh, built as late as 1865, is missing on the arcuated spans in its construction.
- The typical houses in the Najd region are **usually two stories high and built around an open central courtyard.**
- The shape of the courtyard is **usually geometric like a rectangle or a square** and it works as lungs of the houses to **regulate the microclimate** and provide a private space for the family to maintain the private life.
- The main material to built this kind of house is **sun-dried mud bricks and mud.**

2. US destroyed arms control pact – New start treaty

2. Paris Club likely to provide financial assurances to IMF on Sri Lanka debt

Section: Groupings

What the News?

The Paris Club, an informal group of creditor nations, will provide financial assurances to the International Monetary Fund on Sri Lanka's debt, Reuters has reported quoting two unnamed sources.

Why?

An assurance from the Paris Club, as well as other bilateral creditors, is one of the conditions that Sri Lanka has to fulfil for the IMF to begin disbursing a \$2.9 bn bailout package to the beleaguered nation that all but collapsed last year under a severe economic crisis.

What is 'Paris Club' in Economics?

- It is an **informal group of officials from major creditor countries** whose role is to find co-ordinated and sustainable solutions to the payment difficulties experienced by debtor countries.
- Paris Club creditors provide debt treatments to debtor countries in the form of rescheduling, which is debt relief by postponement or, in the case of concessional rescheduling, reduction in debt service obligations during a defined period (flow treatment) or as of a set date (stock treatment).
- The Paris Club is a group of mostly western creditor countries that grew from a 1956 meeting in which Argentina agreed to meet its public creditors in Paris. Their objective is to find sustainable debt-relief solutions for countries that are unable to repay their bilateral loans.
- It describes itself as a forum where official creditors meet to solve payment difficulties faced by debtor countries. All 22 are members of the group called Organisation for Economic Co-operation and Development (OECD).
- **The Paris Club was created gradually from 1956**, when the first negotiation between Argentina and its public creditors took place in Paris.
- The Paris Club treats public claims (that is to say, those due by governments of debtor countries and by the private sector), guaranteed by the public sector to Paris Club members.
- It is **similar to the London club**, which is a group of commercial bankers formed in 1976 to deal with the financial problems of Zaire, and is focussed on providing various forms of debt relief to countries that face financial distress due to their heavy debt load.
- There are currently **22 Permanent Members of the Paris Club**—
- The members are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Japan, Netherlands, Norway, Russia, South Korea, Spain, Sweden, Switzerland, the United Kingdom and the United States.
 - Unlike China and India, Japan is a member of the Paris Club.

How has Paris Club been involved in debt agreements?

- According to the information on its website, since its beginnings, the Paris Club has reached 478 agreements with 102 different debtor countries. Since 1956, the debt treated in the framework of Paris Club agreements amounts to \$ 614 billion.
- It operates on the principles of consensus and solidarity. Any agreement reached with the debtor country will apply equally to all its Paris Club creditors.
- A debtor country that signs an agreement with its Paris Club creditors, should not then accept from its non-Paris Club commercial and bilateral creditors such terms of treatment of its debt that are less favourable to the debtor than those agreed with the Paris Club.
- The role of the Paris Club over time
- The Paris group countries dominated bilateral lending in the last century, but their importance has receded over the last two decades or so with the emergence of China as the world's biggest bilateral lender.

3. Sweden and Finland vow joint entry

Section: Groupings

Concept:

NATO membership — Process

- NATO has what it calls an “**open door policy**” on new members — **any European country** can request to join, so long as they meet certain criteria and all existing members agree.
- A country does not technically “apply” to join; Article 10 of its founding treaty states that, once a nation has expressed interest, the existing member states “may, by unanimous agreement, invite any other European State in a position to further the principles of this Treaty ... to accede.”
- Ratification of new members could take a year, as the legislatures of all 30 current members must approve new applicants.
- Both Finland and Sweden already **meet many of the requirements for membership, which include**
 - having a functioning democratic political system based on a market economy;
 - treating minority populations fairly;
 - committing to resolve conflicts peacefully;
 - the ability and willingness to make a military contribution to NATO operations; and
 - Committing to democratic civil-military relations and institutions.

When countries joined NATO

1949

NATO was formed with founding members Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom and the United States

1952

Greece, Turkey

1955

West Germany

1982

Spain

1999

Czech Republic, Hungary, Poland

2004

Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, Slovenia

2009

Albania, Croatia

2017

Montenegro

2020

North Macedonia

Note: The former East Germany became part of NATO when Germany reunified in 1990.

What does NATO membership entail?

- The reason most countries join NATO is because of Article 5 of the North Atlantic Treaty, which stipulates that all signatories **consider an attack on one an attack against all**.
- Article 5 has been a cornerstone of the alliance since **NATO was founded in 1949** as a counterweight to the Soviet Union.
- The point of the treaty, and Article 5 specifically, was to deter the Soviets from attacking liberal democracies that lacked military strength.
- Article 5 guarantees that the resources of the whole alliance — including the massive US military — can be used to protect any single member nation, such as smaller countries who would be defenseless without their allies. Iceland, for example, has no standing army.

4. Canada commits to taking in 10000 Uyghur refugees from 2024

Section: Msc

Context:

Canada's Parliament passed a motion unanimously on Wednesday to take in 10,000 Uyghur refugees who fled China but are now facing pressure to return.

The decision builds on a February 2021 move by Canadian lawmakers to label Beijing's treatment of Uyghurs and other Turkic Muslims in its north western Xinjiang territory as genocide.

Rights groups believe at least 1 million Uyghurs and other mostly Muslim minorities have been incarcerated in internment camps in the region, where China is also accused of forcibly sterilizing women and imposing forced labour

Uighurs:

- The Uighurs are Muslim ethnic community which speak a language close to Turkish, and are culturally and ethnically closer to Central Asia than the rest of China live in Xinjiang, the largest and most western of China's administrative regions.
- Till recently, they were the majority in **Xinjiang**, but massive registered and unregistered settlements of Han Chinese and heavy troop deployments have likely changed that situation.
- Besides ethnicity and cultural dissonance, tensions are seen as rooted also in economic factors — as China's development has lifted cities like Kashgar and Urumqi, young, qualified Han Chinese from eastern regions have come to Xinjiang, taking the most lucrative jobs and triggering resentment among the indigenous population.

- In Beijing's official narrative, much of the Uighur terrorist violence is carried out by the East Turkestan Islamic Movement, a group that seeks to establish an independent East Turkestan state in China.
- China has been criticized at different forums for violation of Human rights of Uighur population.



5. Potential enlargement of the European Union

Section: Groupings

Concept:

- There are **eight recognised candidates for membership of the European Union**: Turkey (since 1999), North Macedonia (2005), Montenegro (2010), Serbia (2012), Albania (2014), Moldova (2022), **Ukraine (2022)**, and **Bosnia and Herzegovina (2022)**.
- Kosovo (whose independence is not recognised by five EU member states) and Georgia formally submitted applications for membership in 2022 and are **considered potential candidates** by the European Union.
- **Montenegro and Serbia, the most advanced candidates**, are expected to join earlier than the others.
- Due to multiple factors, talks with Turkey are at an effective standstill.
- **Any country that satisfies the conditions for membership** can apply for EU membership.

What is the Copenhagen Criteria?

- The Copenhagen Criteria **refers to the conditions that candidate countries must meet** before they can be part of the European Union.
- The criteria had been established in 1993 by the Copenhagen European Council, and later strengthened in 1995 by the Madrid European Council.
- Copenhagen Criteria also refer to the rules defined by the European Council in 1993 in Denmark, Copenhagen, which determines whether a country is qualified to join the European Union.
- In order to become a member of the EU, the **three criteria that must be achieved are**:
 - Stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities.
 - The existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the union.
 - The ability to take on the obligations of membership including adherence to the aims of political, economic & monetary union.

Criteria for Membership

- The European community always monitors the progress of candidate states that have applied for the EU accession.
- **Three documents** are used to **define the European Union membership criteria**. These include:
 - **Article 49 of the 1992 Maastricht Treaty**
 - The **1993 declaration the European Council in Copenhagen** (includes political, legislative, and economic policies)
 - Framework for negotiations with specific conditions for every candidate country.

Candidate country status

- **Candidate country status is conferred by the European Council on the basis of an opinion from the European Commission**, drawn up following an application for membership of the European Union (EU) by the country concerned.
- Candidate country status **does not give an automatic a right to join the EU**.
- The Commission scrutinises the application in the light of the accession criteria (Copenhagen criteria), while the accession process starts with the European Council decision to open accession negotiations.
- Depending on their circumstances, a candidate country may be required to institute a reform process to bring their legislation in line with the EU acquis and to strengthen their infrastructure and administration if necessary.

- The accession process is based on the pre-accession strategy, which provides instruments such as financial aid.
- Accession and membership of the EU depends on the progress made by the candidate country, which is regularly assessed and monitored by the Commission.

6. Two years of Myanmar coup

Sections: India's neighbours

Concept:

- India and Myanmar relationship officially got underway after the **Treaty of Friendship was signed in 1951**, after which the foundation for a more meaningful relationship was established during Prime Minister Rajiv Gandhi's visit in 1987.
- India and Myanmar have traditionally had much in common, with cultural, historical, ethnic, and religious ties, in addition to sharing a long geographical land border and maritime boundary in the Bay of Bengal.

Geo-Strategic Location of Myanmar:

- Myanmar is geopolitically significant to India as it stands at the **center of the India-Southeast Asia geography**.
- Myanmar is the **only Southeast Asian country that shares a land border with northeastern India, stretching some 1,624 kilometers**.
- The two countries also share a **725-km maritime boundary in the Bay of Bengal**.
- **Irrawady river** that flows from **north to south through Myanmar (Burma)**. It is the country's largest river and most important commercial waterway.



Confluence of Two Foreign Policy Doctrines:

- Myanmar is the only country that sits at the **intersection of India's "Neighborhood First" policy and its "Act East" policy**.
- Myanmar is an **essential element in India's practice of regional diplomacy** in the Indo-Pacific and serves as a land bridge to connect South Asia and Southeast Asia.
- Myanmar is the member of both **Association of Southeast Asian Nations (ASEAN)**, which is an organization of East Asian nations as well as **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)** which bridges South and South-East Asia.

Indian Projects in Myanmar

- **India-Myanmar-Thailand Trilateral Highway**
- A number of infrastructure projects are underway. This includes the Trilateral Highway which will eventually **connect India to Thailand through Myanmar**.
- **Kaladan Multimodal Project**
- The Kaladan Multi-Modal Transit Transport Project was jointly identified by the India and Myanmar to create a **multi-modal mode of transport for shipment of cargo from the eastern seaport of India to Myanmar and to the North-Eastern part of India through Myanmar**.
- This project connects **Sittwe Port in Myanmar to the India-Myanmar border**, is expected to contribute to the economic development of the North-Eastern States of India.



- It is also an **alternate route to India's North-East bypassing the Siliguri Corridor.**
- **Projects in Rakhine State**
- India had signed a memorandum of understanding (MoU) with Myanmar for **improving the socio economic condition of the people belonging to Myanmar's Rakhine state** under the aegis of **Rakhine State Development Programme.**

7. First tourism working group G20 meeting at Rann of Kutch

Concept:

- For the **first G20 Tourism Working Group meeting to be held in Rann of Kutch next week**, India's rural tourism and archaeological tourism potential will be projected to the world.
- Participants in the 3-day meeting (which begins on February 7) include the **United Nations' World Tourism Organisation (UNWTO)** and **International Labour Organisation (ILO).**

Focus of the meeting:

- Rural Tourism for Community Empowerment and Poverty Alleviation.
- To improve Rural and Archaeological Tourism with suggestions from international boards and best practices.

India's achievements in rural and archaeological tourism:

- The **Ladpura Khas village** was nominated as the **Best Rural Tourism Village by the UNWTO.** In this village, the State government developed homestays in villages under the Responsible Tourism Mission of the State.
- **Nagaland's Khonoma Village** will present the model of Ecotourism Management Board that develops Rural Tourism Products and promotes responsible travel.
- **Dholavira** – the southern centre of the Harappan Civilisation, was **named as a UNESCO World Heritage Site in July 2021.**
- Dholavira is believed to have been occupied around 3500 BC (pre-Harappan) till around 1800 BC (late-Harappan period).
- It is the fifth largest of eight major Harappan sites, including Harappa, Mohenjo-daro, Ganeriwala, Rakhigarhi, Kalibangan, Rupnagar and Lothal.
- **Astrotourism**
- India will also present the innovative model of **community based Astrotourism** that involves rural homestays and community spaces.
- **Astrotourism** is any kind of tourism that **involves the night sky or visiting facilities related to astronomy like observatories.**
- These are completely run by villagers and provide travellers an integrated experience of stargazing along with cultural immersion in the Himalayas.

Next meetings:

- The **next tourism track meeting will be held in April in Siliguri/Darjeeling**, while the third meeting will be held in May in one of the north Indian hill states, the final ministerial meeting will be held in Goa in June.
- The idea is to cover and showcase the geographical expanse of the country – with Gujarat in the West to Siliguri in the North-East, going up till the northernmost regions.

United Nations World Tourism Organisation

- The World Tourism Organization (UNWTO) is the **United Nations Specialised Agency** responsible for the promotion of responsible, sustainable and universally accessible tourism.
- It was established **in 1975 with headquarters at Madrid, Spain.**
- UNWTO encourages the implementation of the **Global Code of Ethics for Tourism**, to maximize tourism's socio-economic contribution while minimizing its possible negative impacts.

- Its membership includes **160 Member States, 6 Associate Members and many Affiliate Members** representing the private sector, educational institutions, tourism associations and local tourism authorities.

8. Cooperation in Trilateral Framework

Concept: Groupings

- **India, France and the United Arab Emirates** declared their common intent to formalise a “**trilateral cooperation initiative**” to collaborate on **nuclear energy and explore opportunities in the Indian Ocean region**.
- Three countries also discussed cooperation in a trilateral framework, to promote compatibility and co-production in the defence sector and in countering infectious diseases.
- A range of trilateral events will be held in the backdrop of the Indian Presidency of the G-20 and UNFCCC COP28 to be held in UAE in November-December 2023.
- The trilateral was first discussed when the three Ministers — Dr. Jaishankar, France’s Catherine Colonna and the UAE’s Abdullah bin Zayed Al Nahyan — had met on the sidelines of the UN General Assembly in New York in September 2022.

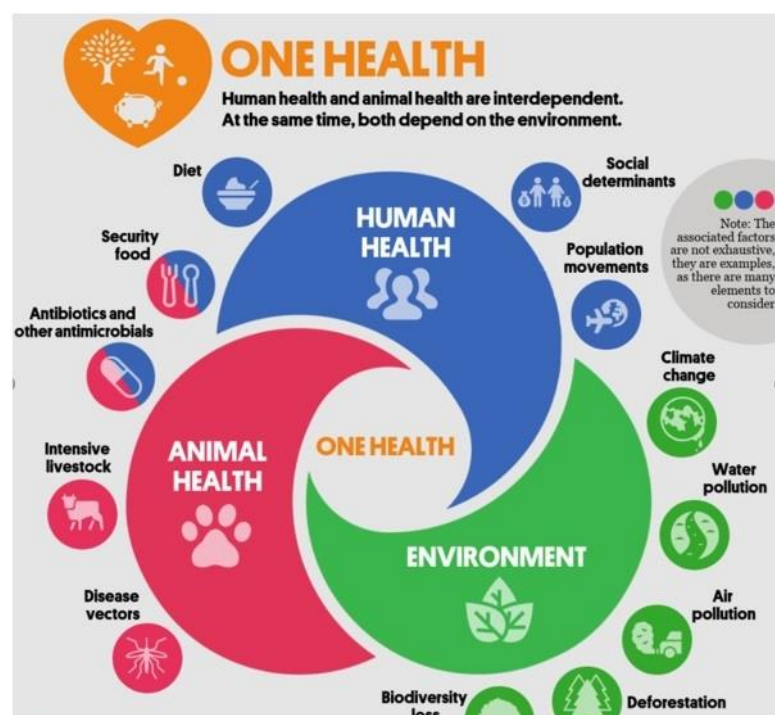
Cooperation to fight Climate Change:

- This trilateral cooperation initiative is with a **focus on solar and nuclear energy, the fight against climate change and the protection of biodiversity**.
- The initiative is expected to act as a platform to bolster cooperation on sustainable projects between the development agencies of the three countries, which will also work to align their economic, technological and social policies with the objectives of the Paris Agreement.
- The three countries also agreed to expand their cooperation through initiatives such as the **Mangrove Alliance for Climate led by the UAE and the Indo-Pacific Parks Partnership led by India and France**.
- It was agreed that the three countries should seek to focus on key issues such as single-use plastic pollution, desertification, and food security in the context of the International Year of Millets-2023.
- The three countries also underlined their keen desire to cooperate in the field of the circular economy under the aegis of India’s Mission LiFE.

Towards ‘One Health’:

- Separately, France, India and the UAE also agreed to increase cooperation **in the field of combating diseases and pandemics** and joining forces in the field of vaccination.
- In this regard, cooperation in multilateral organisations such as World Health Organization (WHO), Gavi-the Vaccine Alliance, the Global Fund, and Unit aid will be encouraged.
- Further, the three countries are planning to attempt to identify **tangible cooperation on implementing the “One Health” approach**, and support the development of local capacities in biomedical innovation and production within developing countries.

One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment



Collaboration in Defense Sector:

- Foreign Ministers of three countries also discussed cooperation in a trilateral framework to promote compatibility, joint development and co-production while seeking out avenues for further collaboration and training defence forces of the three countries.
- The development of trilateral cooperation between relevant academic and research institutions and efforts to promote co-innovation projects, technology transfer, and entrepreneurship will be encouraged.

9. Trade and Technology Council (TTC)

Section: Bilateral relations

- India and the EU have set up a new Trade and Technology Council (TTC), with a focus on trade, investment & value chains, digital economy and clean technology.
- It will allow India and the EU to tackle strategic challenges at the nexus of trade, trusted technology and security, and to deepen their bilateral relationship and help implement political commitments in these fields,” according to a joint statement on the TTC issued by the two sides on Monday.
- **Working groups**
 - Three working groups on strategic technologies, digital governance and digital connectivity; green and clean energy technologies; and trade, investment and resilient value chains, have been established under the TTC.
 - The TTC will be co-chaired on the EU side by Executive Vice-Presidents Margrethe Vestager and Valdis Dombrovskis, and on the Indian side by Minister of External Affairs S Jaishankar, Minister of Commerce and Industry Piyush Goyal, and Minister of Electronics and Information Technology Ashwini Vaishnaw, according to a statement issued by the EC.

10. Surveillance balloon

Section : Msc

Concept :

- The United States shot down a Chinese surveillance balloon that had floated over American airspace for several days, triggering the latest diplomatic crisis amid already worsening relations between the world’s two biggest powers.

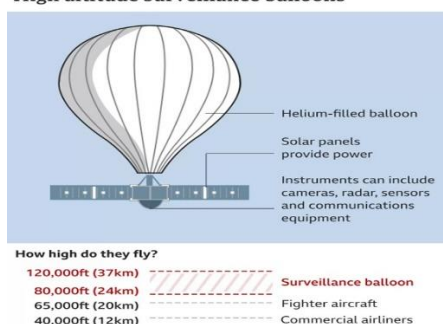
Purpose of Sending the Balloon:

- China has for decades complained about US surveillance by ships and spy planes near its own territory, leading to occasional confrontations over the years. According to China, the balloon was for research but got off track.

The spy balloon:

- Around a decade-and-a-half after the first ever hot air balloon took flight with humans, balloons were already being used for military purposes.
- During the French Revolutionary Wars in the late 18th century, balloons were used to provide a bird’s eye view of the battlefield, with there being documented evidence of their use in the Battle of Fleurus in 1794.
- Since then, **balloons have been in use in all kinds of conflict, from the American Civil War to World War I.**
- For well over a century, before aircraft technology really took off during the Great War, balloons were the primary mode of big-picture reconnaissance, providing perspective on enemy positions and movements simply impossible to obtain from the ground.
- During World War II, as technologies evolved and balloons could be pushed to higher altitudes, their use evolved as well.
- For instance, the Japanese military tried to loft incendiary bombs into US territory using balloons designed to float in jet stream air currents.
- After the war, the US military started exploring the use of high-altitude spy balloons, which led to a large-scale series of missions **called Project Genet.**
- The project flew photographic balloons over Soviet bloc territory in the 1950s – a time before the sheer ubiquitousness of surveillance satellites we see today.
- While their use has declined with the rise of unmanned drones and satellites, many countries still employ spy balloons.

High altitude surveillance balloons



How relevant are high-altitude balloons today?

- While satellites and improved aeroplane and drone technologies have reduced the salience of high-altitude balloons in the military, they still occupy an important niche.
- Unlike satellites which can cost millions of dollars to create, and require sophisticated technology to launch, high-altitude balloons are cheap and easy to launch and control.
- While balloons cannot directly be steered, they can be roughly guided to a target area by changing altitudes to catch different wind currents
- Moreover, unlike satellites which are at much higher altitudes and moving at incredible speeds, spy balloons have the advantage of being able to hover around at lower heights, thus providing better quality images as well as more time to gather intelligence in a particular area.

11. Sub saharan Africa is the new epitome of extremism

Section: Msc

Concept :

- The new global epicentre of violent Islamic extremism is sub-Saharan Africa where people are increasingly joining because of economic factors and less for religious ones, says a new report by **the United Nation's international development agency**.
- A significant increase of 92% of new recruits to extremist groups are joining for better livelihoods compared to the motivations of those interviewed in a previous report released in 2017, according to the **Journey to Extremism in Africa: Pathways to Recruitment and Disengagement Report by the United Nations Development Programme (UNDP)**.
- The region of the African continent **located south of the Sahara Desert is known as sub-Saharan Africa**



United Nations Development Programme (UNDP)

- The **United Nations Development Programme (UNDP)** is the UN's global development network that helps developing national and local capacities to achieve human development and the Sustainable Development Goals.
- UNDP's work is concentrated on three main focus areas: **Sustainable development Democratic governance and peacebuilding Climate and disaster resilience**.
- In all its activities, UNDP promotes gender equality and the protection of human rights.

How is UNDP related to the UN?

- UNDP, as we know it now, was **established in 1965 by the General Assembly** of the United Nations and has its **headquarters in New York City**.
- UNDP participates in 66 **"Delivering as One" initiatives** which enable UN Country Teams to operate more coherently, effectively and efficiently, minimizing transaction costs, reducing duplication and scaling up common approaches and joint initiatives.

12. Olympics row: 35 countries demand Russia and Belarus ban

Section: International organisation

Context:

A group of 35 countries, including the United States, Germany and Australia, will demand that Russian and Belarusian athletes are banned from the 2024 Olympics, the Lithuanian sports minister said on Friday, deepening the uncertainty over the Paris Games.

The move cranks up the pressure on an International Olympic Committee (IOC) that is desperate to avoid the sporting event being torn asunder by the bloody conflict unfolding in Ukraine.

IOC

- IOC was created on 23 June 1894. The first Olympic Games of the modern era opened in Athens on 6 April 1896.
- It is a not-for-profit independent international organisation.
- HQ: Lausanne, Switzerland.

Mandate:

- The IOC is the supreme authority of the Olympic Movement and is responsible for organising the modern Summer and Winter Olympic Games.
- The IOC is the governing body of the National Olympic Committees (NOCs), which are the national constituents of the worldwide Olympic Movement. As of 2016, there are 206 NOCs officially recognised by the IOC.

13. World Hindi Conference in Fiji to highlight links with Pacific Ocean region: MEA

Section: Msc

Concept :

- The **12th World Hindi Conference** will be held in **Fiji from 15 to 17 February 2023**.
- The **official language of Fiji is Hindi**.
- The Government of India is taking efforts to promote Hindi and enhance its stature among the world languages.
- It is also making efforts to ensure a rightful place for Hindi at the UN and the places that hosted Indian Indentured labours in the 19th century.
- Currently **UN provides all the important messages and press releases in Hindi. This facility is also available for Bangla and Urdu.**
- It was highlighted that World Hindi Conference in Fiji would also provide an opportunity to **highlight the links between India and the Pacific Ocean region.**
- A delegation of around 270 academics, experts, and Hindi writers would participate in the upcoming conference.

About World Hindi Conference

- The **World Hindi Conference** provides common platform to several Hindi scholars, writers and laureates from different parts of the world to contribute to the language.
- It will be **organised by Ministry of External Affairs, Government of India** in association with Government of Mauritius.
- It is organised **every third year**.
- The first World Hindi Conference was held in 1975 in Nagpur.

14. Two events on sidelines of G20 meet in Indore

Section: International Organizations

Concept :

- The first meeting of the G20 Agriculture Working group, will be held at Indore, in Madhya Pradesh from 13th to 15 February 2023.
- Around one hundred delegates from G20 member countries, guest countries and International Organizations are expected to participate in the meeting.
- The topics of the side events to be discussed on day 1 are stock taking of G20 initiatives in Agriculture and Global forum on climate smart agriculture for food security.
- International organisations like Italy headquartered inter-agency platform **Agricultural Market Information System, GEOGLAM**, Wheat Initiative among others will give representations on the topic.

Agricultural Market Information System (AMIS)

- The Agricultural Market Information System (AMIS) is an inter-agency platform to enhance food market transparency and encourage international policy coordination in times of crisis.
- It was **established at the request of the Group of Twenty (G20) in 2011**.
- Countries participating in AMIS **encompass the main producing and consuming countries of major food crops** covered by the initiative: wheat, maize, rice and soybeans.
- AMIS is **hosted by the Food and Agriculture Organization of the United Nations (FAO)** in Rome/Italy and supported by a joint Secretariat, which currently (September 2016) consists of eleven international organizations and entities.

Group on Earth Observations Global Agricultural Monitoring Initiative (GEOGLAM)

- GEOGLAM is a **Group on Earth Observations (GEO) Flagship Initiative**.
- The GEOGLAM policy mandate initially came from the **Group of Twenty (G20) Agriculture Ministers** during the **French G20 Presidency in 2011**.

- The mandate has expanded parallel to the G20 mandate to include food security concerns and now works to support early warning for international agency response to emerging food emergencies.
- GEOGLAM has **produced Stocktaking reports for the G20** in recent years. These reports are available for 2018, 2019 and 2020.
- The purpose of Group on Earth Observations Global Agricultural Monitoring Initiative (**GEOGLAM**) is to increase market transparency and improve food security by producing and **disseminating relevant, timely, and actionable information on agricultural conditions and outlooks of production at national, regional, and global scales.**
- It achieves this by strengthening the international community's capacity to utilize coordinated, comprehensive, and sustained Earth observations.

Group on Earth observations

- The **Group on Earth Observations (GEO)** is a global **partnership of governments and organisations** that envisions “a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations”.
- GEO membership **includes 103 member governments and 95 participating organisations** comprised of international bodies with a mandate to carry out and/or make use of Earth observations.
- Together, the GEO community is creating a **Global Earth Observation System of Systems (GEOSS)** that **will link Earth observation resources worldwide** across the multiple Societal Benefit Areas, and make them available for informed decision-making.

15. Kenya seeks divine help to end crippling, ongoing drought

Context:

- With the prospect of a sixth consecutive failed rainy season in the east and Horn of Africa, Kenya's president is hoping the heavens will finally open with the help of a National Day of Mass prayer on Tuesday.
- The U.N. humanitarian agency has termed the ongoing drought in the region a “**rapidly unfolding humanitarian catastrophe.**”
- William Ruto announced the plans for the country's first ever day of prayer on Sunday at a service in the drought-stricken city of Nakuru, some 100 miles (160 kilometers) from the capital Nairobi.
- It follows a joint call by the country's spiritual leaders to dedicate an entire day to prayer to ease drought conditions in the nation.



Concept:

- **Kenya and other east African nations have been experiencing some of the worst drought conditions in decades**, causing crop failure, loss of livestock, wildlife and biodiversity, and malnutrition.
- Domestic agriculture is a large part of Kenya's economy.
- The **Intergovernmental Authority on Development's** climate center said that since 2020, five rainy seasons have failed, affecting over 50 million people.
- The center will release its projections for the long rains season, typically from March to May, later in February. **Early projections** from other meteorological groups **are not optimistic**.

Drought

- Drought is a **prolonged dry period in the natural climate cycle** that can occur anywhere in the world.
- It is a **slow-onset disaster** characterized by the **lack of precipitation, resulting in a water shortage**.
- In recent decades, drought has emerged as one of the biggest drivers of human life loss and economic loss among weather-related disasters.
- By 2030, or in the next eight years, drought will potentially displace an estimated 700 million people worldwide.
- Africa holds the highest burden of this disaster and East **Africa is reeling under its worst drought in four decades**.

Classification:

- **Meteorological Drought:** It is a situation where there is a reduction in rainfall for a specific period below a specific amount.
- **Hydrological Drought:** It is defined as deficiencies in surface and subsurface water supplies leading to a lack of water for normal and specific needs.
- Such conditions arise even in times of average (or above average) precipitation when increased usage of water diminishes the reserves.
- **Agricultural Drought/ Soil Moisture drought:** It is identified with soil moisture deficiency in relation to meteorological droughts and climatic factors and their impacts on agricultural production and economic profitability.
- **Ecological Drought:** When the productivity of a natural ecosystem fails due to shortage of water and as a consequence of ecological distress, damages are induced in the ecosystem.

Inter-Governmental Authority on Development (IGAD)

- The **Inter-Governmental Authority on Development (IGAD) was formed in 1996** to replace the intergovernmental Authority on Drought and Development (IGADD) which was founded in 1986.
- It is multi-national authority **founded by east African Countries. I.E. Djibouti, Ethiopia, Somalia, Sudan, Uganda and Kenya**.
- It is headquartered **at Djibouti**.
- **The Assembly of Heads of State and Government** is the **apex body of policy making of the Authority** which decides the objectives, guidelines and programs for IGAD.

The Secretariat:

- It assists member states in formulating regional projects in the priority areas, facilitates the coordination and harmonization of development policies, mobilizes resources to implement regional projects and programs approved by the Council.
- It reinforces national infrastructures necessary for implementing regional projects and policies.
- It is headed by the Executive Secretary.

The Council of Ministers:

- It is consisting of the Ministers of Foreign Affairs and one other Minister designated by each member state. It formulates policy, sanctions the work program and annual budget of the Secretariat during its half-yearly sessions.

The Committee of Ambassadors:

- It comprises IGAD member states' Ambassadors or Plenipotentiaries accredited to the country of IGAD. It calls together as often as the need arises to advise and guide the Executive Secretary.

16. Ukraine Grain Corridor

Section: United Nation

Concept:

- Russia said on Monday it would be "inappropriate" to **extend the Black Sea grain deal** unless sanctions imposed on Moscow following its invasion of Ukraine on Feb. 24 last year that have affected its agricultural exports are lifted.
- The deal to free up grain exports from Ukraine's southern Black Sea ports was extended on Nov. 17 for 120 days.
- It has created a protected sea transit corridor and was designed to alleviate global food shortages by allowing exports to resume from three ports in Ukraine, a major producer of grains and oilseeds.

Ukraine Stand on the issue

- **Ukraine has not made public any changes it is seeking**, but in the run-up to the November agreement, it sought unsuccessfully to have the deal expanded to include more ports.
- Ukraine wanted to **include the ports of the southern Mykolaiv region**, which provided 35% of Ukrainian food exports before Russia's invasion.

Black Sea Grain Initiative

- The Black Sea Grain initiative endeavours to tackle escalating food prices emanating from supply chain disruptions because of Russian actions in the world's 'breadbasket'.
- The **deal brokered by the United Nations (UN) and Turkey**, was signed in Istanbul in July, 2022.
- It provides a safe maritime humanitarian corridor for Ukrainian exports (particularly for food grains) from three of its key ports, namely, **Chornomorsk, Odesa and Yuzhny/Pivdennyi in the Black Sea.**



Objective:

- Initially stipulated for a period of 120 days, the deal was to provide for a safe maritime humanitarian corridor for Ukrainian exports (particularly for food grains).
- The central idea was to calm markets by ensuring an adequate supply of grains, thereby limiting food price inflation.
- **Role of Joint Coordination Centre (JCC):**
- **The deal put in place a Joint Coordination Centre (JCC), comprising senior representatives from Russia, Turkey, Ukraine and the UN for oversight and coordination.**
- All commercial ships are **required to register directly with the JCC** to ensure appropriate monitoring, inspection and safe passage. Inbound and outbound ships (to the designated corridor) transit as per a schedule accorded by the JCC post-inspection.
- This is done so as to ensure there is no unauthorised cargo or personnel onboard.
- Following this, they are allowed to sail onwards to Ukrainian ports for loading through the designated corridor.

17. China faces grilling in review of key rights by UN committee

Concept:

- Chinese Ambassador Chen Xu and a delegation of about 40 envoys from China, Hong Kong and Macau faced questions from the **N. Committee on Economic, Social and Cultural Rights**, which **reviews respect of those rights in nearly all U.N. member states every few years.**
- The hearing was built around questions from submissions from nearly 20 nongovernmental groups, and conducted by independent experts working with the U.N. who make up the committee, which aims to help countries uphold their commitments under the **International Covenant on Economic, Social and Cultural Rights.**

About UN Committee on Economic, Social and Cultural Rights (CESCR):

- The CESCR was set up in 1985 by the **Economic and Social Council (ECOSOC)** of the United Nations.
- It was constituted with an aim to **monitor on its behalf the implementation of the International Covenant on Economic, Social and Cultural Rights (ICESR)**, which has been **ratified by 169 countries**.
- The countries that are parties to the covenant are required to **submit reports to the CESCR every five years** on how they protect the economic, social and cultural rights.
- The **committee examines each report and addresses its concerns and recommendations to the State party** in the form of concluding observations.
- The Members of the CESCR serve in their personal capacities as experts and do not represent their countries even though they may be nominated by their own nation.
- The CESCR meets in Geneva and holds two sessions per year, consisting of a three-week plenary and a one-week pre-session working group.

International Covenant on Economic, Social and Cultural Rights (ICESCR)

- The International Covenant on Economic, Social and Cultural Rights (ICESCR) is a **multilateral treaty adopted by the United Nations General Assembly (GA)**.
- It commits its parties to work toward the granting of **economic, social, and cultural rights (ESCR)** to the **Non-Self-Governing and Trust Territories and individuals**, including labour rights and the right to health, the right to education, and the right to an adequate standard of living.
- As of July 2020, the Covenant has 171 parties. **India ratified the treaty in 1979.**
- A further four countries, including the **United States**, have signed but not ratified the Covenant.
- The **ICESCR (and its Optional Protocol)** is part of the **International Bill of Human Rights**, along with the **Universal Declaration of Human Rights (UDHR)** and the **International Covenant on Civil and Political Rights (ICCPR)**, including the latter's first and second Optional Protocols.
- The Covenant is **monitored by the UN Committee on Economic, Social and Cultural Rights**.
- **Optional Protocol :**
- The **Optional Protocol to the International Covenant on Economic, Social and Cultural Rights** is a side-agreement to the Covenant which allows its parties to recognise the competence of the **Committee on Economic Social and Cultural Rights** to consider complaints from individuals.

18. International organization for migration

Section: International Organizations

Concept:

- At least 73 Europe-bound migrants are missing and presumed dead in a shipwreck off Libya, the United Nations migration agency said Wednesday.
- The U.N. **International Organization for Migration** said in a statement that the wreck took place Tuesday, and that Libya authorities have retrieved at least 11 bodies.

International Organization for Migration

- IOM is an **intergovernmental organization** that provides services and advice concerning migration to governments and migrants, including refugees, internally displaced persons and migrant workers.
- IOM was **established in 1951** as Intergovernmental Committee for European Migration (ICEM) to help resettle people displaced by World War II.
- It was granted **Permanent Observer status to UN General Assembly in 1992**.
- Cooperation agreement between IOM and the UN was signed in 1996.
- **World Migration Report** is published every year by **International Organization for Migration (IOM)** of the UN.
- IOM works in **four broad areas of migration management**:
 - Migration and development,
 - Facilitating migration,
 - Regulating migration and
 - Forced migration.
- It has **166 member states**, a further 8 states holding observer status and offices in over 100 countries.
- **India is a member of IOM.**

19. China and Russia Fail to Defund UN Human Rights Work

Section: International Organization

Concept:

- United Nations member states agreed to fully fund UN human rights mechanisms that China, Russia, and their allies had sought to defund in the 2023 budget. This should set a precedent for UN human rights funding in the future.

Background

- During the General Assembly's budget negotiations in late 2022, China, Russia, and allies proposed a resolution to defund human rights investigations in various countries.
- all these efforts failed.
- The Czech Republic as **European Union president countered by proposing full funding for human rights mechanisms** at the level proposed by Secretary-General António Guterres. The resolution **passed by a sizable majority**.

UN Human rights funding

- Almost **two thirds of UN Human Rights' income come from voluntary contributions from Member States and other donors**.
- The remainder is **covered by the UN regular budget**.

UN Regular Budget

- The **UN regular budget, approved by the General Assembly**, is funded by **"assessed contributions"** from each **Member State**.
- These are **determined by a formula** that takes into account the size and strength of their respective national economies.
- The **2023 regular budget is the fourth annual budget** prepared in accordance with the UN management reform agenda.
- Indeed, during its seventy-second session, the General Assembly approved the proposed change from a biennial to an annual budget cycle on a trial basis, beginning with the programme budget for 2020.
- The General Assembly reviewed the implementation of the annual budget at its seventy-seventh session in September 2022, with a view to taking a final decision.

India's Contribution

- India has paid USD 29.9 million in UN regular budget assessments for the year 2022.
- Apart from regular contribution, India has contributed **four lakh US dollars to four Voluntary Trust Funds** as part of its **commitment to global promotion and protection of human rights** and support for United Nations Human Rights.
- The **four Trust Funds** to which contribution has been made includes,
 - Voluntary Fund for Victims of Torture,
 - Voluntary Fund for Technical Cooperation,
 - Voluntary Fund for financial and technical assistance for the implementation of Universal Periodic Review,
 - Voluntary Technical Assistance Trust Fund to support the participation of Least Developed Countries (LDCs) and Small Island Developing States (SIDs) in the work of the council.

20. Munich security conference

Section: Msc

Concept:

- **Billionaire investor George Soros** said that the allegations levied by US short-seller Hindenburg Research against the Adani Group **threaten to hurt investor confidence in India** and might weaken Prime Minister Narendra Modi's hold on the government.

Munich security conference

- The Munich Security Conference is an **annual conference on global security issues**, was founded by a German official and publisher Ewald-Heinrich von Kleist at the **peak of the Cold War**.
- It is the world's leading forum for **debating international security policy**.
- It is a venue for diplomatic initiatives to address the world's most pressing security concerns.
- The **2023 conference is being attended by the leaders of France and Germany, as well as U.S. Vice President Kamala Harris and Secretary of State Antony Blinken, China's top diplomat Wang Yi and NATO chief Jens Stoltenberg.**
- **Russian delegates** who were regular attendees at Munich in the past **have not been invited**.
- **Background**
- Munich gained a grim reputation during the 1973 Olympics when the Israeli team was taken hostage by the Palestinian Black September group.
- MSC is often remembered as the venue where the Russian President made his famous 2007 speech when he elaborated on the post-Cold War Russian security concerns and publicly opposed the expanding footprint of North Atlantic Treaty Organization (NATO) and placing of nuclear-tipped missiles in Eastern Europe.

Objectives:

- The MSC's objective is to build **trust and to contribute to the peaceful resolution of conflicts** by sustaining a continuous, curated and informal dialogue within the international security community.
- The primary objective of the MSC was to make sense of international affairs in an age when weapons of mass destruction had become part of the game.
- The MSC conceives of its **conferences as a type of "marketplace of ideas"** where initiatives and solutions are developed and opinions are exchanged.

- It provides a venue for **official and non-official diplomatic initiatives** and ideas to address the world's most pressing security concerns.
- In addition to its annual flagship conference, the MSC regularly convenes high-profile events on particular topics and regions and **publishes the Munich Security Report**.
- **Audience:**
- **Senior decision-makers** as well as thought-leaders from around the world, including **heads of state, ministers, leading personalities** of international and non-governmental organizations, high-ranking **representatives of industry, media, academia, and civil society**, come to engage in an intensive debate.

21. Ex Dharma Guardian

Section: Msc

Concept:

- The 4th edition of joint military exercise, "EX DHARMA GUARDIAN", between India and Japan began at Camp Imazu in Shiga province of Japan.

About Exercise Dharma Guardian:

- It is a **joint military training**.
- It provides a unique opportunity of achieving **synergy between Armed Forces of both the Nations** which is focused towards strengthening the timeless bonds of India – Japan friendship.
- It provides a platform for professional and cultural learnings well as social interactions which in-turn broadened their horizon towards knowledge and cooperation aiming towards co-existence as one in the Indo-Pacific Region.
- Conduct of this exercise covers cross training & combat conditioning in field conditions, sports and cultural exchanges.
- It enhances the **level of defence cooperation between the Indian Army and Japanese Ground Self Defence Forces** and act as a catalyst for many such joint programs in future to further consolidate on the gains achieved.
- To promote military cooperation between India and Japan, the first **edition of the Dharma Guardian** was held at Counter Insurgency Warfare School of the Indian Army at Vairengte in **November 2018**.

22. Exercise Mosi II

Section: Msc

Concept:

- Exercise Mosi II is a **tri-nation naval exercise between Russia, China and South Africa**.
- The **2023 edition is being held in Durban and Richards Bay, South Africa** (Indian Ocean coast) from 17 February.
- This is seen as a demonstration of the three countries' close ties amid Russia's invasion of Ukraine and China's tense relationship with the West.
- **Russia** is expected to **test-fire Zircon hypersonic missiles during the drills**.
- The **first edition** took place off Cape Town in the southwest of South Africa in the waters of the Atlantic Ocean in **November 2019**.

Richards Bay:

- Richards Bay is a **large port on the east coast of South Africa**, located where the **Mhlatuze River drains into the Indian Ocean**.
- More coal is exported (shipped to other countries) from Richards Bay than from any other port in the world.

Zircon hypersonic missiles

- Zircon is a **Hypersonic Cruise Missile developed by Russia**.
- It has been called as one of the **invincible missiles by the Russian President**.
- The missile flies with an **advanced fuel that the Russians say gives it a range of up to 1,000 kilometers**.
- The missile speed is also **so fast that the air pressure in front of the weapon forms a plasma cloud as it moves, absorbing radio waves and making it practically invisible to active radar systems**.

23. African Union summit

Section: International Organizations

Concept:

- **Israel condemned the "severe" expulsion of a diplomat from the African Union summit in Addis Ababa**, accusing Iran of orchestrating the move with help from Algeria and South Africa.

About African Union

- The African Union (AU) is a **continental body consisting of the 55 member states** that make up the countries of the African Continent.
- **Formation:**
 - **In 1963, the Organization of African Unity** was founded by the independent states of Africa. The organization aimed to promote cooperation between African states.
 - The 1980 Lagos Plan of Action was adopted by the Organization of African Unity. The plan suggested that Africa should minimize reliance upon the West by promoting intra-African trade.
 - **In 2002, the Organization of African Unity was succeeded by the African Union**, which had as one of its goals to accelerate the “economic integration of the continent”.
- The most important **decisions of the AU are made by the Assembly of the African Union**, a semi-annual meeting of the heads of state and government of its member states.
- The AU’s secretariat, the African Union Commission, is **based in Addis Ababa**. The most important decisions of the AU are made by the Assembly of the African Union, a semi-annual meeting of the heads of state and government of its member states.
- The AU structure **promotes participation of African citizens and civil society** through the **Pan-African Parliament and the Economic, Social & Cultural Council (ECOSOCC)**.
- The AU’s secretariat, the African Union Commission, is based in **Addis Ababa, Ethiopia**.

African Continental Free Trade Area:

- It was **established in 2018 by the African Continental Free Trade Agreement (AfCFTA)**.
- **AfCFTA** seeks to create a **single continental market for goods and services, with free movement of business persons and investments**, and thus pave the way for accelerating the establishment of the Continental Customs Union and the African customs union.
- The AfCFTA preliminary work is on steps such as **incremental tariff reduction, elimination of non-tariff barriers, supply chains and dispute settlement**.
- It is expected to boost intra-African trade by about USD35 billion by the end of 2022.
- The larger market area will likely attract investment for continental infrastructure development.
- The increased trade will create jobs, enhance Africa’s global competitiveness, improve social welfare and position Africa for greater industrialisation.

24. International Mother Language Day 2023 – ‘Ekushey February’

Section: Msc

Concept:

- In recognition of the Bengali people’s struggle for their language and culture, UNESCO announced in 1999 that **February 21 would be observed worldwide as International Mother Language Day**.
- This year’s theme is “Multilingual education – a necessity to transform education”, emphasising Indigenous people’s education and languages.

International Mother Language Day 2023

- UNESCO promotes this year’s “Multilingual **education – a necessity to transform education**”, emphasising Indigenous people’s education and languages.
- It also discusses the potential role of technology to advance multilingual education and support the development of quality teaching and learning for all.
- This year, the webinar focuses on two main themes namely;
- Teachers’ role to be enhanced in promoting quality multilingual teaching and learning.
- Reflecting on technologies and their potential to support multilingual teaching and learning.
- UNESCO organizes several events on this day and encourages people to maintain their knowledge of their mother language and learn the use of more than one language.
- Several policies are also announced by governments and non-governmental organizations to promote the learning of language and support.
- Various activities are also organized in schools and colleges to celebrate the diversity of languages.
- Linguistic diversity is increasingly threatened because several languages are disappearing.
- **According to UNESCO, 40 percent population of the world does not have access to an education in a language they speak or understand**. Therefore, it is necessary to make progress in mother tongue-based multilingual education with the need for understanding its importance.

About 1952 Bengali Language Movement, Bangladesh

- When India gained independence from British rule, the subcontinent of India was divided into a separate Muslim state (East Pakistan and West Pakistan) and a separate Hindu state (India).
- There was a cultural and lingual conflict between East Pakistan (today Bangladesh) and West Pakistan (Today Pakistan).
- In 1948, the government of Pakistan declared Urdu as the national language and due to it, the tensions grew more.

- This decision of the government sparked several violent protests amongst the Bengali-speaking majority in East Pakistan.
- **Some students of the University of Dhaka organized a protest with some activists on 21 February 1952.** Later that day, the police opened fire at the students, protesters, and four students of the university who were killed.
- The martyrdom of these students who fought for the Bengali language to be used as their mother language officially is remembered on International Mother Language Day.
- Finally on 29 February 1956, Bengali was recognized as the second official language of Pakistan. In 1971, East Pakistan became an independent country namely Bangladesh, and Bengali became its official language.
- As discussed above the General Conference of UNESCO in November 1999 declared International Mother Language Day and on 21st February 2000, the first International Mother language Day was observed.

25. UN declares international decade of indigenous languages (2022-32)

Section: Msc

Concept:

- By adopting a resolution on the occasion of closing ceremony of international year of indigenous languages 2019, **United Nations declared international decade of indigenous languages beginning from 2022.**
- The resolution was **based on the recommendations made by the 3rd committee of UNGA** (relating to social, humanitarian and cultural issues) led by Ecuador and Bolivia.
- The proclamation of an International Decade is a key outcome of the 2019 International Year of Indigenous Languages, for which the United Nations Educational, Scientific and Cultural Organization (UNESCO) lead global efforts.
- **The United Nations Educational, Scientific and Cultural Organization (UNESCO)will serve as the lead agency** for the international decade of indigenous languages, as it did for international year, in **with the United Nations Department of Economic and Social Affairs (UNDESA) and other relevant UN Agencies.**
- The **International Decade** aims at ensuring indigenous peoples' right to preserve, revitalize and promote their languages, and mainstreaming linguistic diversity and multilingualism aspects into the sustainable development efforts.

26. Russia suspends New START treaty

Section: International Agreements

Concept:

- President Vladimir Putin announced that Russia is suspending its participation in the New START treaty, the only remaining nuclear arms control treaty between the United States and Russia.

New START Treaty: Background

- The name START comes from the original “**Strategic Arms Reduction Treaty**”, known as START-I.
- START-I was signed between the US and the erstwhile USSR in 1991, and came into force in 1994.
- START-I capped the numbers of nuclear warheads and intercontinental ballistic missiles (ICBMs) that each side could deploy at 6,000 and 1,600 respectively.
- START-I lapsed in 2009 and was **replaced first by the Strategic Offensive Reductions Treaty (SORT, also known as the Treaty of Moscow), and then by the New START treaty.**

New START Treaty

- **New START Treaty** is officially known as – “Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms”.
- It was signed by then-**President Barack Obama and then-Russian president Dmitry Medvedev in 2010.**
- The treaty entered into **force in February 2011**, and placed **new verifiable limits on intercontinental-range nuclear weapons.**
- Under the treaty, the United States and Russia were given seven years to scale back their stockpiles of strategic offensive arms — broadly, nuclear warheads deployed by missiles, planes or submarines that can travel long distances.
- After February 2018, both the countries had to maintain the stockpiles of these arms within the limits fixed by the treaty, for the period the treaty remained in force.
- The US and Russia Federation subsequently agreed to **extend the treaty through February 4, 2026.**

What limits did the New START impose on the two countries?

- **700 deployed intercontinental ballistic missiles (ICBMs)**, deployed submarine-launched ballistic missiles (SLBMs), and deployed heavy bombers equipped for nuclear armaments;
- **1,550 nuclear warheads** on deployed ICBMs, deployed SLBMs, and deployed heavy bombers equipped for nuclear armaments (each such heavy bomber is counted as one warhead toward this limit);
- **800 deployed and non-deployed ICBM launchers**, SLBM launchers, and heavy bombers equipped for nuclear armaments.

How is compliance with the treaty ensured?

- Detailed procedures for the implementation and verification of the central limits, and all treaty obligations, are part of the treaty terms.
- The treaty **provides for 18 on-site inspections per year for US and Russian inspection teams.**

Compliance status

- Both countries met the limits spelled out in the treaty by February 2018 and appear to have remained at or below them since then.
- However, **regular inspections mandated by the agreement have not been held for the past three years** — initially because of the coronavirus pandemic, and later because relations soured after Russia invaded Ukraine.

28. New President for World Bank

Section: International Organizations

Concept:

- US President Joe Biden is nominating former Mastercard CEO, India-born Ajay Banga, to be head the World Bank.

Appointment of the President of World Bank:

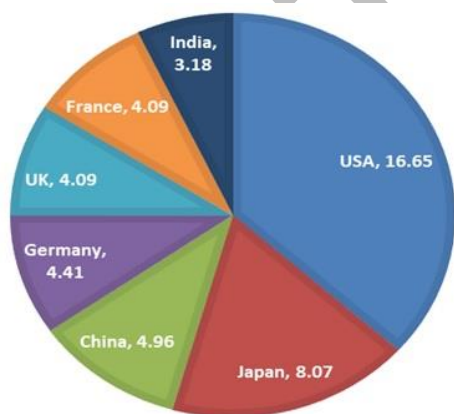
- The **President of the World Bank Group serves as Chairman of the Board**, and is **selected by the Executive Directors**.
- The President is the presiding officer, and ordinarily has no vote except a deciding vote in case of an equally divided Board.
- As per the guidelines of the World Bank, the **World Bank president must have:**
 - A proven track record of leadership.
 - Experience managing large organizations with international exposure, and a familiarity with the public sector.
 - Ability to articulate a clear vision of the Bank's development mission.
 - A firm commitment to and appreciation for multilateral cooperation.
 - Effective and diplomatic communication skills, impartiality, and objectivity.

Who can nominate?

- **Executive directors of the World Bank** can nominate candidates for the post and the **candidate must be citizens of one of the bank's member countries and cannot be a bank governor, executive director or alternate.**
- If there are **more than three candidates**, there would be a **shortlisting process to narrow the field through an informal straw poll.**
- Then the **shortlisted candidates will be interviewed by the board.** The board will then make a final selection through a majority vote.

Number of votes needed to win:

- To win the presidency of the World Bank, a **candidate must win approval from the institution's executive board, which has 25 members.**
- The **US holds a 16% share of board voting power** hence more often it is the **US-backed candidate gets elected for the post of the president.**



Voting Power in World Bank

- Member countries are **allocated votes at the time of membership** and **subsequently for additional subscriptions to capital.**
- To become a member of the Bank, a country must first join the International Monetary Fund (IMF).

Governors

- A Board of Governors represents the Bank's government shareholders. Each member nation appoints a Governor and an Alternate Governor. Generally, these governors are country ministers, such as Ministers of Finance or Ministers of Development.
- The governors are the ultimate policymakers in the World Bank. They meet once a year at the Bank's Annual Meetings.

Executive Directors

- The Bank's 25 Executive Directors oversee the Bank's business, including approving loans and guarantees, new policies, the administrative budget, country assistance strategies, and borrowing and financial decisions.
- Under the IBRD Articles of Agreement, **each of the five members having the largest number of shares appoints an Executive Director, , and the remaining members elect the other Executive Directors.**

29. French Troops withdrawn from Burkina Faso

Section :Places in news

Concept :

- On February 19, Burkina Faso announced an official end to the operations led by France in the country.
- France was asked to withdraw its troops from Burkina Faso months after it pulled out its troops from Mali.

Reasons for withdrawal

- The primary reason behind the withdrawal is the **failure of its counter insurgency operations in the Sahel region against Islamist groups.**
- Secondly, as **Islamist insurgency kept intensifying**, France's military presence in Burkina Faso came under scrutiny.
- After the second coup in September 2022, anti France protests increased in Burkina Faso with demonstrators demanding French withdrawal from the country.
- There was also an **increasing proRussia sentiment.**

Background

- On November 9, 2022 French President Emmanuel Macron announced the **end of the decade-long Operation Barkhane in Africa.**
- French President, Mr. Macron said that, "Our military support for African countries will continue, but according to new principles that we have defined with them."

Operation Barkhane

- In January 2013, France started conducting military operations in the Sahel.
- **Operation Serval, as it was known**, was restricted to going after Islamic extremists affiliated with al-Qaeda who had taken over northern Mali.
- The operation, **now known as Operation Barkhane**, was renamed and scaled up in 2014 with a **counterterrorism focus.**
- The goal was to **support regional military forces in their efforts to stop the emergence of non-state armed groups throughout the Sahel.**
- The regional joint counterterrorism force deployed about 4,500 French personnel.
- The Operation Barkhane initiative, which aims to **combat terrorism in Mali, Niger, Burkina Faso, Mauritania, and Chad**, was launched as a result of the 2014 success. But Operation Barkhane saw a number of setbacks.
- First, the region saw the expansion of new groups linked to terrorist organizations, notably the Islamic State, notwithstanding the operation.
- Second, the operation's failure triggered a humanitarian crisis.
- Third, the failure of Operation Barkhane to put an end to the insurgencies in the area led to a rise in civilian military support, which in turn exacerbated the political unrest that followed in the Sahel.

Sahel Region

- In Africa, the Sahel is the region of **ecoclimatic and biogeographic transition between the Sudanese savanna to the south and the Sahara to the north.**
- It covers the southern central latitudes of Northern Africa, between the Atlantic Ocean and the Red Sea, and has a semi-arid climate.
- The name is derived from the Arabic word for "coast, shore," which is used metaphorically to allude to the southernmost tip of the huge Sahara, it is said.
- The Sahel part includes from west to east parts of northern **Senegal**, southern **Mauritania**, central **Mali**, extreme north of **Burkina Faso**, the extreme south of **Algeria**, **Niger**, the extreme north of **Nigeria**, the extreme north of **Cameroon** and the Central African Republic, central **Chad**, central and southern **Sudan**, the extreme north of **South Sudan**, **Eritrea** and the extreme north of **Ethiopia.**(Read with MAP)



Great Green Wall (GGW) Programme:

- It was launched in **2007 by the African Union**.
- **Initial idea for the GGW:** A band of trees about 8,000 kilometers long and 8 kilometers wide, stretching across Africa from east to west.
- The GGW programme aims to restore 100 million hectares of degraded ecosystems across 11 countries in the region.
- It aims to promote sustainable development and climate change mitigation.
- By 2030, the GGW aims to sequester 250 million tonnes of carbon, restore 100 million hectares of currently degraded land and create 10 million jobs for the world's poorest people.

Countries selected as intervention zones for the Great Green Wall are:

- Burkina Faso, Chad, Djibouti, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Senegal and Sudan.

30. FATF suspends membership of Russia

Subject : International Relation

Section : International Organizations

Concept :

- **Financial Action Task Force (FATF)** has **suspended Russia's membership** over Moscow's invasion of Ukraine.
- The move marks the first suspension of a country from the Financial Action Task Force.
- In a statement, it said that Russia's actions are completely in violation of FATF core principles aiming to promote security, safety, and the integrity of the global financial system.
- The FATF identified Russia's involvement in the arms trade and malicious cyber-activities, as well as evasion activities.
- The suspension comes after a campaign by Ukraine for FATF to add Russia to the FATF blacklist.
- **Implications :**
 - The suspension of Russia means Russia can no longer attend the group's meetings both physically and virtually and can no longer access FATF documents. However, Russia remains accountable for implementing FATF's anti-money-laundering standards.
 - Russia since June 2022 has been restricted from holding any leadership or advisory roles or participating in decision-making on standard-setting, peer-review processes, and governance and membership issues.
- **Note :** On February 24, **FATF also added Nigeria and South Africa to its 'grey list', while removing Morocco and Cambodia** from the list.
- **About Financial Action Task Force (FATF):**
- FATF is an **inter-governmental policy-making and standard-setting body** dedicated to **combating money laundering and terrorist financing**.
- **Objective:** To establish international standards, and to develop and promote policies, both at national and international levels, to combat money laundering and the financing of terrorism.
- It was established in 1989 during the G7 Summit in Paris to develop policies against money laundering.
- In 2001 its mandate expanded to include terrorism financing.
- **Headquarters:** Paris, France.
- FATF members include 39 countries, including the United States, India, China, Saudi Arabia, Britain, Germany, France, and the EU as such.
- **India became a member of FATF in 2010.**
- **FATF has 2 types of lists:**
- **Black List:**
 - Countries known as Non-Cooperative Countries or Territories (NCCTs) are put on the blacklist. These countries support terror funding and money laundering activities. The FATF revises the blacklist regularly, adding or deleting entries.
 - Three countries **North Korea, Iran, and Myanmar** are currently in **FATF's blacklist**.

- **Grey List:**
- Countries that are considered a safe haven for supporting terror funding and money laundering are put on the FATF grey list. This inclusion serves as a warning to the country that it may enter the blacklist.
- **United Arab Emirates (UAE), Turkiye, Jordan, South Africa and 20 other nations** are in its 'Grey List'

Consequences of being on the FATF blacklist:

- No financial aid is given to them by the International Monetary Fund (IMF), the World Bank, the Asian Development Bank (ADB) and the European Union (EU).
- They also face a number of international economic and financial restrictions and sanctions.

31. Environmental cost of Russia-Ukraine War

Concept :

- The conflict in Ukraine has racked up environmental costs that will far outlive the actual fighting.

How the Russia-Ukraine war induced destruction?

- **Fighting-induced destruction :**
- The conflict has seen many damages with incidents involving nuclear power plants, energy infrastructure, mines and industrial sites.
- It resulted in air pollution and contamination of ground and surface waters.
- More than 2 million hectares of forest have been destroyed putting the rare endemic species at risk.
- According to **claims by the Ukraine's environment ministry**, altogether the **losses from land, water and air pollution amounted to \$51.4 billion.**

Carbon footprint :

- Emission from the conflict was estimated to be around **33 mn tonnes of CO2 and 23 mn tonnes of CO2 from fires.**
- The reconstruction could **emit 49 mn tonnes of CO2.**

Leopard 2 Tanks :

- The state-of-the-art Leopard 2 tanks have a fuel capacity of 1200 litres.
- This roughly consumes between 3.5-5.5 litres of fuel per km.

Radioactive exposure :

- Russian troops dug up deep trenches in the protected Chernobyl sanctuary, an area largely untouched since the nuclear disaster in 1986.
- This could have dug up dangerous radioactive material.
- **Deforestation:**
- **More than 2 million hectares of forest have been destroyed**, wrecking ecosystems and putting rare endemic species at risk.

What is the way forward?

- Even when the conflict ends, the immediate efforts of reconstruction will focus only on housing and building infrastructure.
- Restoration of environment should not be given priority.
- World Nations should take immediate actions to stop the war and its deleterious impact on environment.
- Restoration of ecosystem should be given equal priority as reconstruction of infrastructure.

32. FM highlights rising debt vulnerabilities in G20 Finance meet

Section : International Events

Concept :

- Speaking at **inaugural session of the G20 finance ministers and central bank governors (FMCBG) meeting**, Finance Minister **highlighted rising debt vulnerabilities in many developing countries** and sought views from G20 member nations on '**multilateral coordination**' for managing the burden.
- Sitharaman also sought views on how **multilateral development banks, like the IMF and World Bank, can be strengthened** to address shared global challenges of the 21st century, while **maintaining a focus on Sustainable Development Goals (SDGs) and poverty eradication.**

First G 20 Finance meet

- First G20 Finance Ministers and Central Bank Governors under India's G20 Presidency meeting began in Bengaluru.
- The discussions of the first session of G20 FMCBG meeting focused on **issues relating to international financial architecture, sustainable finance and infrastructure.**

G20 Finance Track 2023

- G20 Finance Track discusses global macroeconomic issues through its meetings of Finance Ministers and Central Bank Governors, their Deputies and various working group meetings.
- Some of the **key issues dealt by the Finance Track** are
 - Global economic outlook and monitoring of global economic risks;
 - Reforms for a more stable and resilient global financial architecture;
 - International taxation;
 - Financing quality infrastructure;
 - Sustainable finance;
 - Financial inclusion;
 - Financial sector reforms and
 - Financing for future health emergencies and investments in pandemic prevention, preparedness and response.

G20 Finance Track Achievements

- Some of the key achievements of the Finance Track especially in the post-pandemic phase are-
 - Debt Service Suspension Initiative (DSSI),
 - Common Framework for debt treatments beyond DSSI,
 - G20 Sustainable Finance Roadmap,
 - Two pillar solution to tax challenges arising from the digitalization of the economy,
 - G20 principles for quality infrastructure investment,
 - Proposal to create a Financial Intermediary Fund (FIF) for pandemic PPR etc.

Note : India's G20 Presidency Theme is "Vasudhaiva Kutumba-kam" or "One Earth One Family One Future".

33. Marconi Prize 2023

Concept :

- Hari Balakrishnan has been awarded the 2023 Marconi Prize. He is a Professor in the Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology (MIT).
- He has been **cited "for fundamental contributions to wired and wireless networking, mobile sensing, and distributed systems"**.

About Marconi Prize

- The Marconi Prize is an **annual award that recognizes individuals** who have made **significant contributions to the field of communications and information technology**.
- It is named after Guglielmo Marconi, an Italian inventor and pioneer in the development of wireless communication.
- The Marconi Prize is one of the most prestigious awards in the field of telecommunications and is **often referred to as the "Nobel Prize of Telecommunications."**
- The prize is administered by the Marconi Society, a non-profit organisation that promotes awareness and understanding of important scientific and technical issues in the field of communications.
- The Marconi Prize **consists of a cash award of \$100,000 and a commemorative medal**.
- The Marconi Society also awards other prizes and scholarships, including the Marconi Society Paul Baran Young Scholar Award, which recognizes young researchers who have demonstrated exceptional technical and leadership abilities in the field of communications and information technology.
- Previous winners of the award include Sir Tim Berners-Lee, Google co-founder Sergey Brin and sci-fi author Arthur C. Clarke.

34. IMF and FSB to flesh out global crypto rules

Section : International Organizations

Concept :

- India, which is currently holding G20 Presidency, has asked the IMF and Financial Stability Board (FSB) to jointly prepare a technical paper on crypto assets, which could be used in formulating a coordinated and comprehensive policy to regulate them.

About Financial Stability Board (FSB):

- FSB is an international body that monitors and makes **recommendations about the global financial system**.
- It was established in April 2009 after the G20 Summit in London as the successor to the Financial Stability Forum.

Mandate:

- To coordinate at the international level the work of national financial authorities and international standard-setting bodies and to develop and promote the implementation of effective regulatory, supervisory, and other financial sector policies.
- The FSB, working through its members, seeks to strengthen financial systems and increase the stability of international financial markets.
- **Headquarters: Basel, Switzerland.**
- The board includes all G20 major economies.
- **The FSB consists of 68 member institutions.**
- It comprises several central banks, ministries of finance, and supervisory and regulatory authorities from 25 jurisdictions, as well as 10 international organizations and six Regional Consultative Groups (RCGs).

Framework:

- The Plenary, which serves as the sole decision-making body.
- The Steering Committee, which takes forward operational work in between Plenary meetings.
- Three Standing Committees, each with specific but complementary responsibilities.
- **The FSB's decisions are not legally binding on its members.**
- **India and FSB:**
- India is an active Member of the FSB, having three seats in its Plenary represented by Secretary (Dept of Economic Affairs), Deputy Governor-RBI, and Chairman-SEBI.

35. Friendshoring

Section :Msc

Concept:

- Terming India the biggest trading partner, U.S. Treasury Secretary pitched for advancing an **approach called “friendshoring”** to bolster the resilience of supply chains.

Friendshoring

- Friendshoring is a **strategy where a country sources the raw materials, components and even manufactured goods from countries that share its values.**
- The dependence on the countries considered a “threat” to the stability of the supply chains is slowly reduced.
- It is **also called “allyshoring”**.
- For the US, Russia has long presented itself as a reliable energy partner, but in the Ukraine war, it has weaponized the gas against the people of Europe.
- It's an example of how malicious actors can use their market positions to try to gain geopolitical leverage or disrupt trade for their own gain.
- **Friend-shoring or ally-shoring has become a means for the US to influence firms to move their sourcing and manufacturing sites to friendly shores**—often back to the same shores in the case of the US.
- The **purpose of Friendshoring** is to **insulate countries' supply chains from less like-minded nations, such as China in case of the US.**

36. U.K., EU start ‘new chapter’ over N. Ireland trade pact

Section: Msc

Concept :

- The British Prime Minister has negotiated a new deal with the European Union (EU) on post-Brexit trade rules for Northern Ireland.
- According to the British Prime Minister, the deal would pave the way for a new chapter in London's relationship with the bloc.
- Northern Ireland, which is a British province, has an open border with Ireland, which is an EU member.

The current process

- The goods are checked at ports in Northern Ireland on arrival
- They can then be moved into the Republic of Ireland once checked



The new plan

- The goods are split into two different lanes
- Goods destined for Northern Ireland go into the **Green Lane** meaning they wouldn't have to be checked and would require minimal paperwork
- Goods destined for Ireland and the EU go into the **Red Lane** and checks are carried out



- The deal seeks to resolve tensions caused by the 2020 post-Brexit arrangements governing Northern Ireland and its open border with the Republic of Ireland.
- The issue has triggered the collapse of the regional government, and affected Northern Ireland's peace process and ties between the UK and EU.
- The new deal is expected to ease physical checks on goods flowing from other parts of the UK to Northern Ireland.

Polity

1. Decriminalisation of adultery doesn't apply on armed forces: SC

Section: Msc

Concept:

- Armed forces would be at liberty to initiate disciplinary proceedings against officers and personnel for adultery notwithstanding that the Supreme Court had decriminalised the offence in 2018.
- On Tuesday, a five-judge constitution bench clarified that in the judgment on September 27, 2018, the **SC was concerned only with the validity of Section 497 of the IPC and Section 198(2) of the CrPC dealing with adultery**, and had **“no occasion whatsoever to consider the effect”** with respect to the Army, Navy and Air Force Acts.

Armed Forces Tribunal

- It is a military tribunal in India.
- It was **established in 2009 under the Armed Forces Tribunal Act, 2007**.
- The act was passed on the basis of **recommendation of 169th Law Commission Report** and various Supreme Court directives.
- **Powers and functions:**
 - To adjudicate Disputes and complaints with respect to commission, appointments, enrolments and conditions of service in respect of persons **subject to the Army Act, 1950, The Navy Act, 1957 and the Air Force Act, 1950**.
- **Composition:**

- Each Bench comprises of a **Judicial Member and an Administrative Member**.
- Judicial Members are **retired High Court Judges**.
- **Administrative Members are retired Members of the Armed Forces** who have held the rank of Major General/ equivalent or above for a period of three years or more or Judge Advocate General (JAG), who have held the appointment for at least one year.
- **Who can be a chairperson?**
- The person holding the office of chairperson of AFT must have been either a retired judge of Supreme Court or a Retired chief justice of high court.
- **Exceptions:**
- **Paramilitary forces** including the Assam Rifles and Coast Guard are **outside the tribunal's purview**.
- **AFT is considered to be a criminal court** with respect to Indian Penal Code, and Code of Criminal Procedure.
- **Appeals against the decision of the AFT can be taken only in Supreme Court.** High Courts are not allowed to entertain such appeals.

2. Judicial majoritarianism

Section: Judiciary

Concept :

- Against the backdrop of the recent Supreme Court judgement on demonetisation, the majority judgement of the Court on issues had been criticised while **the minority judgement by Justice Nagarathna is being acclaimed**.

Background

- A five-judge Constitution Bench of the Supreme Court upheld the government's process to demonetise ₹500 and ₹1000 banknotes through a gazette notification issued on the 8th of November 2016.
- A Constitutional Bench of the Supreme Court upheld the government's demonetisation process in a 4:1 majority verdict.

What is judicial majoritarianism?

- While standard matters are placed in front of Division Benches which consist of two judges, cases that mandate the interpretation of constitutional provisions would require numerical majorities in order to reach a conclusion.
- Hence to hear such **cases that mandate the interpretation of the constitutional provisions, Constitutional Benches are formed which consist of at least five judges or more**.
- Constitutional Benches usually consist of five, seven, nine, 11 or even 13 judges (odd numbers) in order to facilitate decision-making via numerical majorities.
- **Constitutional Benches are set up** in accordance with the **provisions of Article 145 (3) of the Constitution**.
- As per Article 145 (3), a minimum of five judges must sit for deciding a case involving a "substantial question of law as to the interpretation of the Constitution", or for hearing any reference under Article 143, which deals with the power of the President to consult the Supreme Court.
- **Article 145 (5) of the Constitution required a majority consensus for a judicial outcome.**
- According to Article 145 (5), "no judgment in such cases can be delivered except with the concurrence of a majority of the judges but that judges are free to deliver dissenting judgments or opinions".

Constitutional history of meritorious dissents

- In the **A.D.M. Jabalpur v. Shivkant Shukla (1976) case**: the dissenting opinion of Justice H.R. Khanna in upholding the Right to Life and personal liberty even during situations of constitutional exceptionalism is regarded as a remarkable example of meritorious dissent.
- In the **Kharak Singh v. State of U.P. (1962) case**: the dissenting opinion of Justice Subba Rao in upholding the Right to Privacy which was later approved through the **K.S. Puttaswamy Judgment** is also a prime example of meritorious dissent.

3. Govt can seek rethink on collegium recommendations

Section :Judiciary

Concept :

- Asserting that the **Union government can seek a reconsideration of the names recommended by the Supreme Court Collegium (SCC)**, Law Minister Kiren Rijju informed the Rajya Sabha that there are 18 such cases.

Collegium system and the government role

- It is the **system of appointment and transfer of judges** that has **evolved through judgments of the Supreme Court, and** not by an Act of Parliament or by a provision of the Constitution.
- The **Supreme Court collegium** is headed by the **Chief Justice of India** and comprises four other seniormost judges of the court.
- A **High Court collegium** is led by its **Chief Justice** and four other seniormost judges of that court.

- Names recommended for appointment by a High Court collegium are appointed, only after approval by the CJI and the Supreme Court collegium.
- According to the existing procedure, the High Court Collegiums send their proposals for the appointment of judges to the Law Ministry's Justice Department, which then attaches Intelligence Bureau reports on the candidates and forwards the proposal to the Supreme Court Collegium to take a call.
- Judges of the higher judiciary are appointed only through the collegium system — and the government has a role only after names have been decided by the collegium.
- The government's role is limited to getting an inquiry conducted by the Intelligence Bureau (IB) if a lawyer is to be elevated as a judge in a High Court or the Supreme Court.
- It can also raise objections and seek clarifications regarding the collegium's choices, but if the collegium reiterates the same names, the government is bound, under Constitution Bench judgments, to appoint them as judges.

4 SC Allows Adoption of Child of 20-Year-old Student who Sought Abortion of 29-Week Pregnancy

Section: Judiciary

Context:

- The Supreme Court invoked its extraordinary power under Article 142 to allow the adoption of a child after the delivery of a 20-year-old student who was carrying a 29-week unwanted pregnancy.
- Solicitor General Tushar Mehta and Bhati apprised the court that an effort has been made to facilitate the process of adoption of the child after delivery, by prospective parents who are registered with the **Child Adoption Resource Authority (CARA)** under the Union Ministry of Women and Child Development. The court was apprised of the fact that two prospective parents who have been registered with a parent registration number under CARA are ready and willing to adopt the child.
- It further added that permission is granted for the adoption of the child by the prospective parents whose details have been set out in the CARA registration form and CARA shall take all necessary steps to facilitate the implementation of this order.
- SC adopted the present course of action consistent with the jurisdiction of this court under **Article 142** of the Constitution having regard to the extraordinary situation which has emerged before the court involving a young woman in distress, who moved this court at a late stage of her pregnancy.

CARA:

- Central Adoption Resource Authority (CARA) is a statutory body of Ministry of Women & Child Development, Government of India. It functions as the nodal body for adoption of Indian children and is mandated to monitor and regulate in-country and inter-country adoptions. CARA is designated as the Central Authority to deal with inter-country adoptions in accordance with the provisions of the Hague Convention on Inter-country Adoption, 1993, ratified by Government of India in 2003.
- CARA primarily deals with adoption of orphan, abandoned and surrendered children through its associated / recognised adoption agencies.

What is Article 142 of the Constitution:

- **Article 142** provides a **unique power to the Supreme Court**, to do **complete justice** between the **parties**, where at times law or statute may not provide a remedy.
- In those situations, the **Court can extend itself to put a quietus to a dispute** in a manner that would fit the facts of the case.

5. SC junks plea seeking bar on twin candidature in polls

Section: Elections

Context: A PIL was filed to restrict a candidate from contesting the Lok Sabha and Assembly elections simultaneously from more than one constituency.

Details:

- The SC said in the absence of any manifest arbitrariness in Section 33(7) of the RPA, it was not possible to strike it down.
- SC observed that permitting a candidate to contest from more than one seat is a matter of legislative policy since it is ultimately the Parliament's will as to whether the political democracy in the country is furthered by granting such a choice.
- Noting that candidates may contest elections from different seats due to a variety of reasons, the top court said it was for Parliament to decide if such a choice would further the course of democracy.

Why there is a demand to restrict candidates to one constituency?

- "One person, one vote" and "one candidate, one constituency" is the dictum of democracy. However, as per the law, as it stands today, a person can contest the election for the same office from two constituencies simultaneously

6. SC refuses to refer conversion issue to law commission

Section: National Body

Concept:

- The Supreme Court on Friday refused a plea to refer to the **Law Commission of India** the question whether “**forcible conversion**” should be made a separate offence relating to religion under the Indian Penal Code.

Law Commission of India

- The Law Commission of India is a **non-statutory body constituted by the Government** of India from time to time.
- The **first Law Commission of independent India** was established in **1955** for a three-year term.
- The first Law Commission was **established during the British Raj era in 1834** by the Charter Act of 1833 and was chaired by Lord Macaulay.

Objectives:

- It works as an advisory body to the Ministry of Law and Justice.
- The Law Commission undertakes research in law and review of existing laws in India for making reforms therein and enacting new legislations on a reference made to it by the Central Government or suo-motu.
- **Composition:**
- Apart from **having a full-time chairperson**, the commission will **have four full-time members, including a member-secretary**.
- **Law and Legislative Secretaries** in the **Law Ministry** will be the **ex-officio members** of the commission.
- It will also have **not more than five part-time members**.
- A **retired Supreme Court judge or Chief Justice of a High Court** will head the Commission.

What are the Important Recommendations of the Commission?

- The Law Commission in its **262nd Report** recommended **abolition of the death penalty** for all crimes except terrorism-related offences and waging war against the state.
- Its report on electoral reforms (1999) had suggested **simultaneous Lok Sabha and state assembly elections** to improve governance and stability.
- The Criminal Procedure (Identification) Act, 2022 which replace the Identification of Prisoners Act, 1920 was also proposed by the Law Commission of India.
- The **21st Law commission** in its recommendation in 2018 said that **Uniform Civil Code (UCC)** is “**neither necessary nor desirable at this stage**”.
- Now, the **center has requested the 22nd Law Commission of India** to undertake an examination of various issues relating to the same.

7. Demand for JPC

Section: Parliament

Context: Demand for JPC

- A structured committee system was introduced in 1993 to provide for greater scrutiny of government functioning by Parliament. Most committees of Parliament include MPs from both the Lok Sabha and Rajya Sabha. A Joint Parliamentary Committee (JPC) is an ad-hoc body. It is set up for a specific object and duration. Joint committees are set up by a motion passed in one house of Parliament and agreed to by the other. The details regarding membership and subjects are also decided by Parliament. For example, the motion to constitute a JPC on the **stock market scam (2001)** and pesticide residues in **soft drinks (2003)** was moved by the government in the Lok Sabha. The motion on the stock market scam constituted a JPC of 30 members of which 20 were from the Lok Sabha and 10 were from the Rajya Sabha. The motion to constitute the JPC on pesticides included 10 members from the Lok Sabha and 5 from the Rajya Sabha. The terms of reference for the JPC on the stock market scam asked the committee to look into financial irregularities, to fix responsibility on persons and institutions for the scam, to identify regulatory loopholes and also to make suitable recommendations.
- The mandate of a JPC depends on the **motion constituting it**. This need not be limited to the scrutiny of government finances.
- Although a number of joint committees have been formed since Independence, four major JPCs have been formed to investigate significant issues that have caused controversy. These are
 - (1) Joint Committee on Bofors Contracts
 - (2) Joint Committee to enquire into irregularities in securities and banking transactions
 - (3) Joint Committee on stock-market scam
 - (4) Joint Committee on pesticide residues in and safety standards for soft drinks.

- JPC recommendations have **persuasive value** but the **committee cannot force the government** to take any action on the basis of its report. The government may decide to launch fresh investigations on the basis of a JPC report. However, the discretion to do so rests entirely with the government. The government is required to report on the follow-up action taken on the basis of the recommendations of the JPC and other committees. The committees then submit '**Action Taken Reports**' in Parliament on the basis of the government's reply. These reports can be discussed in Parliament and the government can be questioned on the basis of the same

Can Joint Parliamentary Committee (JPC) summon ministers?

- According to a direction of the speaker, a Minister cannot be summoned by a financial committee. There are no specific procedures for the Joint Parliamentary Committees mentioned in the rules. However, according to the Directions by the Speaker general rules applicable to Committees shall apply to all Committees, though specific directions can be given for some committees (read here). In other words, the general directions for all committees would be the same, unless a specific direction was given relating to a particular committee. In the Joint Committee of Stock Market Scam and Matters relating there to, a specific request was made to the Speaker, Lok Sabha by the Chairman, JPC on 20th May, 2002 for permitting the Committee to call for written information on certain points from the Minister of Finance and Minister of External Affairs. The Speaker accorded the necessary permission on 1st June, 2002. Consequently, the Minister of Finance (Shri Jaswant Singh), the Minister of External Affairs (Shri Yashwant Sinha) and the former Finance and External Affairs ministers (Shri P. Chidambaram and Dr. Manmohan Singh respectively) testified before the Committee

Role of Committees

Parliament has **24 standing committees** organised on the lines of ministries and departments. Parliamentary Committees are of two kinds:

Standing Committees

- They are **permanent** and **regular committees** which are constituted from time to time in pursuance of the provisions of an Act of Parliament or Rules of Procedure and Conduct of Business in Lok Sabha.
- The work of these Committees is of continuous nature.
- The Financial Committees, DRSCs and some other Committees come under the category of Standing Committees.

Ad hoc Committees

- They are appointed for a specific purpose and they cease to exist when they finish the task assigned to them and submit a report.
- The principal Ad hoc Committees are the Select and Joint Committees on Bills. Railway Convention Committee, Joint Committee on Food Management in Parliament House Complex etc also come under the category of ad hoc Committees.
- The Constitution of India makes a mention of these committees at different places, but without making any specific provisions regarding their composition, tenure, functions, etc. All these matters are dealt by the rules of two Houses.

Accordingly, a parliamentary committee means a committee that:

- Is appointed or elected by the House or nominated by the **Speaker / Chairman**
- Works under the direction of the **Speaker / Chairman**
- Presents its report to the House or to the **Speaker / Chairman**
- Has a secretariat provided by the **Lok Sabha / Rajya Sabha**
- The introduction of **17 department-related** standing committees (DRSCs) on **March 31, 1993** was a significant innovation that increased parliamentary scrutiny and gave MPs a larger role in examining legislation and important decisions of the day.
- There are **24 DRSCs — 16 from Lok Sabha and 8 from Rajya Sabha**. Each committee has **21 MPs from Lok Sabha and 10 from Rajya Sabha**.
- **The role:** Given the volume of legislative business and the time constraints it is not possible for MPs to discuss and scrutinise all bills in the House.
- Parliamentary committees, either formed for a specific bill (select committee) or permanent (standing committees that are reconstituted annually) allow for a scrutiny with the possibility of tapping subject experts from outside and other stakeholders in an environment where MPs are not bound by party positions or whips.

8. CDSCO bars Global Pharma Healthcare from making eye lubricant

Concept: National Body

- The **Central Drugs Standard Control Organisation (CDSCO)** has instructed Tamil Nadu-based Global Pharma Healthcare to stop manufacturing all the products under the category of ophthalmic preparation till the completion of an investigation.
- The move came soon after the **U.S. Centres for Disease Control and Prevention (CDC)** linked the company's eye drops to **55 adverse events in the U.S.**

- CDC have warned that the eye drops supplied by the company to distributors Aru Pharma / EzriCare and Delsam Pharma in the U.S. had been linked to adverse events, including eye infections, permanent loss of vision, and a death with a bloodstream infection.
- Raw material called **carboxymethylcellulose sodium** was used for manufacturing the eye lubricant.
- The company, which has recalled the eye drops from the market, has been placed on the FDA's import alert list for allegedly providing an inadequate response to a records request.

Central Drugs Standard Control Organisation (CDSCO):

- The Central Drugs Standard Control Organisation (CDSCO) – under **Directorate General of Health Services, Ministry of Health & Family Welfare**.
- It is the **National Regulatory Authority (NRA)** of India.
- CDSCO is the **Central Drug Authority** for discharging functions assigned to the Central Government under the **Drugs and Cosmetics Act**.
- It regulates the safety, efficacy and quality of notified medical devices under the provisions of Drugs and Cosmetics Act, 1940.
- Headquarters – **New Delhi**.

Major functions of CDSCO:

- Under the Drugs and Cosmetics Act, CDSCO is responsible for
- approval of drugs,
- conduct of clinical trials,
- laying down the standards for drugs,
- control over the quality of imported drugs in the country and
- Coordination of the activities of State drug control organizations.

9. Supreme Court celebrates the 73rd anniversary

Section: Judiciary

Concept:

- The Supreme Court of India is hosting its **first-ever celebration of the 73rd anniversary of its establishment**.
- This year's event is being aired on social media platforms and will witness Singapore's Chief Justice Sundaresh Menon, who is of Indian origin, as the chief guest.

When was the Supreme Court Founded?

- On the **January 28, 1950**, two days after India became a sovereign democratic republic, the Supreme Court of India came into being.
- The inauguration took place in the Chamber of Princes in the Parliament building which was the home to the Federal Court of India for 12 years preceding the Supreme Court's establishment.
- The Parliament House was to be the home of the Supreme Court for years that were to follow until the court acquired its own present building with lofty domes and its signature spacious colonnaded verandas in 1958.
- The original Constitution of 1950 envisaged a Supreme Court with a Chief Justice and 7 puisne judges – leaving it to Parliament to increase this number.

Brief History of the Supreme Court of India

- The promulgation of **Regulating Act of 1773** established the **Supreme Court of Judicature at Calcutta as a Court of Record**, with full power & authority.
- It was established to hear and determine all complaints for any crimes and also to entertain, hear and determine any suits or actions in Bengal, Bihar and Orissa.
- The **Supreme Courts at Madras and Bombay were established by King George – III in 1800 and 1823**
- The **India High Courts Act 1861** created **High Courts for various provinces** and abolished Supreme Courts at Calcutta, Madras and Bombay and also the Sadar Adalats in Presidency towns.
- These High Courts had the distinction of being the highest Courts for all cases till the **creation of Federal Court of India** under the **Government of India Act 1935**.
- The Federal Court had jurisdiction to solve disputes between provinces and federal states and hear appeal against Judgements from High Courts.
- After India attained independence in 1947, the Constitution of India came into being on 26 January 1950. The **Supreme Court of India also came into existence and its first sitting was held on 28 January 1950**.
- The law declared by the Supreme Court is binding on all Courts within the territory of India.
- **It has the power of judicial review** – to strike down the legislative and executive action contrary to the provisions and the scheme of the constitution, the distribution of power between Union and States or inimical to the fundamental rights guaranteed by the Constitution.

What are the Constitutional Provisions?

- The Indian constitution provides for a provision of Supreme Court under **Part V (The Union) and Chapter 6 (The Union Judiciary)**.
- **Articles 124 to 147 in Part V of the Constitution** deal with the organization, independence, jurisdiction, powers and procedures of the Supreme Court.
- The Indian constitution under Article 124(1) states that **there shall be a Supreme Court of India constituting of a Chief Justice of India (CJI) and, until Parliament by law prescribes a larger number, of not more than seven other Judges.**
- The Jurisdiction of the Supreme Court of India can broadly be categorized into **original jurisdiction, appellate jurisdiction and advisory jurisdiction**. However, there are other multiple powers of the Supreme Court.

Seat of Supreme Court

- The **Constitution declares Delhi as the seat of the Supreme Court**. It also authorizes the CJI to appoint other place or places as seat of the Supreme Court.
- He can take decision in this regard only with the approval of the President. This provision is only optional and not compulsory.
- This means that no court can give any direction either to the President or to the Chief Justice to appoint any other place as the seat of the Supreme Court.

Jurisdiction and Powers of Supreme Court

Original Jurisdiction

- As a Federal court, the Supreme Court decides disputes between different units of the Indian Federation. More elaborately, any dispute between:
 - the Centre and one or more states; or
 - the Centre and any state or states on one side and one or more states on the other; or
 - between two or more states.
- In the above federal disputes, the Supreme Court has exclusive original jurisdiction.

Writ Jurisdiction

- The Supreme Court is empowered to issue writs, including habeas corpus, mandamus, prohibition, quo-warranto and certiorari for the enforcement of the fundamental rights of an aggrieved citizen.
- In this regard, the Supreme Court has original jurisdiction in the sense that an aggrieved citizen can go directly to the Supreme Court, not necessarily by way of appeal.
- However, the writ jurisdiction of the Supreme Court is not exclusive. The High Courts are also empowered to issue writs for the enforcement of the Fundamental Rights.

Appellate Jurisdiction

- The Supreme Court is primarily a court of appeal and hears appeals against the judgements of the lower courts. It enjoys a wide appellate jurisdiction which can be classified under four heads:
 - Appeals in constitutional matters
 - Appeals in civil matters
 - Appeals in criminal matters
 - Appeals by special leave

Advisory Jurisdiction

- The Constitution under Article 143 authorises the President to seek the opinion of the Supreme Court in the two categories of matters:
 - On any question of law or fact of public importance which has arisen or which is likely to arise.
 - On any dispute arising out of any pre-constitution treaty, agreement, covenant, engagement, sanador other similar instruments.

Court of Record

- As a Court of Record, the Supreme Court has two powers:
 - The judgements, proceedings and acts of the Supreme Court are recorded for perpetual memory and testimony. These records are admitted to be of evidentiary value and cannot be questioned when produced before any court.
 - They are recognized as legal precedents and legal references.
 - It has power to punish for contempt of court, either with simple imprisonment for a term up to six months or with fine up to 2,000 or with both.

Power of Judicial Review

- Judicial review is the power of the Supreme Court to **examine the constitutionality of legislative enactments and executive orders of both the Central and state governments.**

- On examination, if they are found to be violative of the Constitution (ultra-vires), they can be declared as illegal, unconstitutional and invalid (null and void) by the Supreme Court. Consequently, they cannot be enforced by the Government.

10. SC to hear plea on AP's three capitals

Concept :

- The Supreme Court would take up the hearing on Andhra Pradesh's three-capitals plans on February 23.
- The AP government had filed an **Special Leave Petition in the apex court**, challenging the AP High Court's verdict that the AP legislature lacked the competence to make legislation on having three capitals for the state.

Special leave to appeal by the Supreme Court:

- Article 136 in the Constitution Of India :**
- Not with standing anything in this Chapter, the Supreme Court may, in its discretion, grant special leave to appeal from any judgment, decree, determination, sentence or order in any cause or matter passed or made by any court or tribunal in the territory of India.
- Nothing in clause (1) shall apply to any judgment, determination, sentence or order passed or made by any court or tribunal constituted by or under any law relating to the Armed Forces.
- In the case of any SLP , the SC has first to decide in its discretion whether it should grant or deny the requested Special Leave.
- When discussing the SLP, it is important to understand its position with respect to the judgements of Inter-State Water Dispute (ISWD) Tribunal as well.
- The Inter-State Water Disputes Act of 1956, coupled with Article 262 (2) of the Constitution, excludes the SC from hearing or deciding any appeals against the Inter-State Water Dispute (ISWD) Tribunal's decision.
- However, the reference to "any Court or tribunal in the territory of India," in **Article 136 seems to bring the ISWD Tribunals within the purview of the Article.**
- The SC had also argued that the **remedy under Article 136 (Special Leave Petition) is a constitutional right.** Thus, the bar can be overcome through the possible routes under Articles 32, 131, and 136 of the Constitution.
- Article 32 provides for constitutional remedies to get the rights protected through writs namely Habeas Corpus, Mandamus, Prohibition, Certiorari and Quo warranto.
- Article 131 (Original jurisdiction of the Supreme Court) is about Centre-State or inter-State disputes in general.

11. NCST functioning with less than 50% of sanctioned strength: Ministry in LS

Section: National Body (Constitutional body)

Concept:

The **National Commission for Scheduled Tribes (NCST)** was established by amending **Article 338** and inserting a new Article 338A in the Constitution through the Constitution (**89th Amendment**) **Act, 2003**. By this amendment, the erstwhile National Commission for Scheduled Castes and Scheduled Tribes was replaced by two separate Commissions namely- (i) the National Commission for Scheduled Castes (NCSC), and (ii) the National Commission for Scheduled Tribes (NCST) w.e.f. **19 February, 2004**. Detailed background information about the historical evolution of the National Commission has been given in Chapter-1 of the first Report of the Commission for the year 2004-05 and 2005-06.

The term of office of Chairperson, Vice-Chairperson and each member is three years from the date of assumption of charge. The Chairperson has been given the rank of Union Cabinet Minister, and the Vice-Chairperson that of a Minister of State and other Members have the ranks of a Secretary to the Government of India.

Functioning of NCST

(Under Clause (5) of Art. 338A)

- To investigate & Monitor matters relating to Safeguards provided for STs under the Constitution or under other laws or under Govt. Order, to evaluate the working of such Safeguards.
- To inquire into specific complaints relating to Rights & Safeguards of STs;
- To participate and Advise in the Planning Process relating to Socio-economic development of STs, and to Evaluate the progress of their development under the Union and any State;
- To submit report to the President annually and at such other times as the Commission may deem fit, upon/ working of Safeguards, Measures required for effective implementation of Programmes/ Schemes relating to Welfare and Socio-economic development of STs;
- To discharge such other functions in relation to STs as the President may, subject to the provisions of any law made by Parliament, by rule specify;
- The Commission would also discharge the following other functions in relation to the protection, welfare and development & advancement of the Scheduled Tribes, namely:-
 - Measures that need to be taken over conferring ownership rights in respect of minor forest produce to the Scheduled Tribes living in forest areas.

- (ii) Measures to be taken to safeguard rights to the Tribal Communities over mineral resources, water resources etc. as per law.
- (iii) Measures to be taken for the development of tribals and to work for move viable livelihood strategies.
- (iv) Measures to be taken to improve the efficacy of relief and rehabilitation measures for tribal groups displaced by development projects.
- (v) Measures to be taken to prevent alienation of tribal people from land and to effectively rehabilitate such people in whose case alienation has already taken place.
- (vi) Measures to be taken to elicit maximum cooperation and involvement of Tribal Communities for protecting forests and undertaking social afforestation.
- (vii) Measures to be taken to ensure full implementation of the Provisions of Panchayats (Extension to the Scheduled Areas) Act, 1996 (40 of 1996).
- (viii) Measures to be taken to reduce and ultimately eliminate the practice of shifting cultivation by Tribals that lead to their continuous disempowerment and degradation of land and the environment.

Powers of Commission

(Under Clause (8) of Art. 338A)

1. For Investigation and Inquiry, the Commission is vested with powers of a civil court having authority to:
 - a. Summon and enforce attendance of any person and examine on oath;
 - b. Discovery & production of any documents;
 - c. Receive evidence on affidavits;
 - d. Requisition any public record or copy thereof from any court or office;
 - e. Issue Commissions for examination of witnesses and documents; and
 - f. Any matter which President, by rule, may determine.

12. DGP Appointment

Section : Msc

Concept :

- The Nagaland government on Saturday issued an order appointing Rupin Sharma as Director General of the state police, and relieved him of the charge of Home Guards and civil defence.

Background

- On January 23, the Supreme Court had directed the Nagaland government to appoint the 1992-batch IPS officer as police chief within a week.
- The order was passed after Nagaland challenged the Union Public Service Commission's (UPSC) recommendation of Sharma as the only candidate for the post.

Procedure of DGP Appointment

- Supreme Court had **refrained State governments from appointing DGPs without first consulting the Union Public Service Commission (UPSC)**.

It came up with the following guidelines:

- The State governments concerned have to send UPSC the names of the probables three months before the incumbent DGPs are to retire.
- The **UPSC will prepare a panel of three officers** fit to be DGP and send it back.
- The UPSC shall, as far as practicable, choose the people within the zone of consideration who have got a clear two years of service and must give due weightage to merit and seniority.
- The **State, in turn, shall "immediately" appoint one of the persons shortlisted by the UPSC.**
- On the practice of States appointing "Acting DGPs", the **court rejected the idea of acting or temporary DGPs**, i.e., States shall appoint a person as permanent DGP.
- The court also ruled that any rule or state law on the subject of appointment of police officers will be kept in suspension. However, the States, which have made laws on police appointments, can move to court seeking modifications of its order.
- The court had passed the series of directions on an application made by the Centre for modification of its **judgement in Prakash Singh Case of 2006 for reforms** and transparency in the State police forces.

Prakash Singh Case

- In Prakash Singh Case of 2006, the Supreme Court gave 7 directives with a view to bring in police reforms.
- In passing these directives the Court put on record the deep rooted problems of politicization, lack of accountability mechanisms and systemic weaknesses that have resulted in poor all round performance and fomented present public dissatisfaction with policing.

The directives are:-

- Constitute a **State Security Commission (SSC)** to ensure that the state government does not exercise unwarranted influence or pressure on the police, lay down broad policy guideline and evaluate the performance of the state police.
- Ensure that the **DGP is appointed through merit based transparent process** and secure a minimum tenure of two years.
- Ensure that other police officers on operational duties (including Superintendents of Police in-charge of a district and Station House Officers in-charge of a police station) are also **provided a minimum tenure of two years**.
- **Separate the investigation and law & order functions** of the police.
- Set up a **Police Establishment Board (PEB)** to decide transfers, postings, promotions and other service related matters of police officers of and below the rank of Deputy Superintendent of Police and make recommendations on postings and transfers above the rank of Deputy Superintendent of Police.
- Set up a **Police Complaints Authority (PCA)** at state level to inquire into public complaints against police officers of and above the rank of Deputy Superintendent of Police in cases of serious misconduct, including custodial death, grievous hurt, or rape in police custody and at district levels to inquire into public complaints against the police personnel below the rank of Deputy Superintendent of Police in cases of serious misconduct.
- Set up a **National Security Commission (NSC)** at the union level to prepare a panel for selection and placement of **Chiefs of the Central Police Organizations (CPO)** with a minimum tenure of two years.

13. 'Virginity Test' on Accused Unconstitutional

Section : Constitution

Concept :

- The Delhi high court ruled that running a 'virginity test' on a female accused or detainee is unconstitutional and inhuman, and a violation of **Article 21 of the Constitution**.
- Not only does such a test interfere with a woman's bodily integrity, the court said, it can also have a longstanding psychological impact on the woman.

Virginity Test

- The Virginity/ two-finger test, carried out by a medical practitioner, involves the examination of her vagina to check if she is habituated to sexual intercourse.
- The **practice is unscientific and does not provide any definite information**. Moreover, such 'information' has no bearing on an allegation of rape.
- A woman who has been sexually assaulted undergoes a medical examination for ascertaining her health and medical needs, collection of evidence, etc.
- A handbook released by the World Health Organization (WHO) on dealing with sexual assault victims says, "There is no place for virginity (or 'two-finger') testing; it has no scientific validity."

What the Government's Guidelines say?

- After the **2013 Justice Verma Committee report on amendments to criminal law** for a faster trial, and enhanced punishment in sexual assault cases, the Union Health Ministry brought out detailed guidelines for the medical examination of victims of sexual assault in early 2014.
- According to the guidelines '**two-finger test**', **must not be conducted for establishing rape/sexual violence**.
- The **guidelines state that a rape victim's consent** (or her guardian's, if she is minor/mentally disabled) **is necessary for any medical examination**. Even if the consent is not provided, the victim cannot be denied medical treatment.
- However, these are **guidelines and are not legally binding**.

14. 6775 URLs blocked in 2022

Section :Msc

Concept:

- A committee to consider blocking requests under the Information Technology (Procedure and Safeguards for Blocking for Access of Information for Public) Rules, 2009, met 53 times in 2022, the Ministry of Electronics and Information Technology told Parliament.
- An RTI response obtained by the **Commonwealth Human Rights Initiative (CHRI)** reveals that of the 6,775 posts and websites, almost half were posts on Twitter.

In which situations can online content be blocked?

- **Executive route-** Section 69A of the Information Technology Act, 2000 allows the government to direct an intermediary to block online content for access by the public.

Reasons:

- In the interest of sovereignty and integrity of India
- Defence of India
- Security of the state

- Friendly relations with foreign states
- Public order
- Preventing incitement to commission of any cognisable offence
- **Section 69A draws its power from Article 19(2) of the Constitution** which allows the government to place reasonable restrictions on the fundamental right to freedom of speech and expression.
- **Judicial route-** Courts in India, also have the power to direct intermediaries to make content unavailable in India to provide effective remedy to the victim/plaintiff.
- For example, courts may order internet service providers to block websites which provide access to pirated content and violate the plaintiff's copyright.

Procedure for blocking access to content online

- **IT Rules 2009-** The Information Technology (Procedure and Safeguards for Blocking for Access of Information by Public) Rules, 2009 have been formulated under Section 69A of the IT Act.
- **Power of the government-** Only the Central government can exercise this power of directing intermediaries to block access to online content directly, and not the State governments.
- **Nodal officer-** Central or State agencies will appoint a nodal officer who will forward the blocking order to the designated officer of the Central government.
- **Designated officer-** The designated officer, as part of a committee, examines the request of the nodal officer.
- **Committee-** The committee comprises representatives from the Ministries of Law and Justice, Information and Broadcasting, Home Affairs, and the Cert-In.
- **Opportunity of hearing-** The creator/host of the content in question is given a notice to submit clarifications and replies.
- **Recommendation of the committee-** The committee then makes a recommendation on whether the request of the nodal officer should be accepted or not.
- **Removal of content-** If this recommendation is approved by the MeitY, the designated officer can direct the intermediary to remove content.

15. Constitution doesn't allow aldermen right to vote, says SC

Section: Local Government (PRI/ULB)

Concept:

- The Supreme Court while **issuing notice to the Lieutenant-Governor and the pro tem presiding officer of the Municipal Corporation of Delhi (MCD)** has held that the **Constitution does not allow aldermen (nominated members of a municipality) the right to vote in meetings.**
- The Chief Justice of India while hearing a petition filed by the ruling party in Delhi has said that the difference between the elected members and aldermen (nominated members) is very substantial.
- While hearing the arguments that the move by the pro tem presiding officer to allow the nominated members to vote is a **violation of Article 243R(2)(iv) of the Constitution**, Justice P.S. Narasimha noted that it is not just a statute, but the Constitution itself does not allow the aldermen to vote.
- **Section 76 of the Delhi Municipal Corporation Act of 1957**, the **Mayor**, or in his absence the Deputy Mayor, has to **preside over every meeting of the corporation**, the simultaneous holding elections of Mayor, Deputy Mayor and members of the Standing Committees is directly contrary to the provisions of the statute.

Who are Aldermen?

- According to the **Delhi Municipal Corporation Act, of 1957**; The **administrator (the Lieutenant Governor) can nominate 10 people, over the age of 25 to the corporation.**
- These people are expected to have special knowledge or experience in municipal administration.
- They are meant to assist the house in taking decisions of public importance.
- Aldermen refer to the members of a municipal council, but the exact responsibilities depending on the location of its usage.
- They **do not have the right to vote in the mayor polls, but they will hold influential power and play a significant role in the elections of Standing Committees, MCD in-house and ward committee meetings.**
- They will be a part of a group that effectively controls the MCD's purse strings.

Article 243R of Indian Constitution- Composition of Municipalities

- (1) Save as provided in clause (2), all the seats in a Municipality shall be filled by persons chosen by direct election from the territorial constituencies in the Municipal area and for this purpose each Municipal area shall be divided into territorial constituencies to be known as wards.
- (2) The **Legislature of a State may, by law, provide—**
 - a) for the representation in a Municipality of—
 - i. persons having special knowledge or experience in Municipal administration;
 - ii. the members of the House of the People and the members of the Legislative Assembly of the State representing constituencies which comprise wholly or partly the Municipal area;

- iii. the members of the Council of States and the members of the Legislative Council of the State registered as electors within the Municipal area;
 - iv. **the Chairpersons of the Committees constituted under clause (5) of article 243S: Provided that the persons referred to in paragraph (i) shall not have the right to vote in the meetings of the Municipality;**
- b) the manner of election of the Chairperson of a Municipality.

16. P.T. Usha chairs Rajya Sabha amid thumping by members

Section: Parliament

Concept :

- **PT Usha, nominated member** of the Rajya sabha, presided **over the proceedings of the Rajya Sabha** in the absence of Chairman and Vice-President Jagdeep Dhankar.
- In December 2022, Usha became the **first nominated member in the history of the Rajya Sabha to be included in the panel of vice-chairman of the House.**

Panel of Vice-Chairpersons of Rajya Sabha

- **The Chairman of the Rajya Sabha** nominates a **panel of vice-chairpersons** from among the members, according to the Rajya Sabha Rules.
- In the **absence of the Chairman or the Deputy Chairman, any of them can preside over the House.**
- When presiding, he has the same powers as the Chairman. Until a new panel of vice-chairpersons is nominated, he remains in office.
- When a member of the panel of vice-chairpersons is also absent, the House appoints someone else to act as Chairman.
- It is important to note that **while the Chairman or Deputy Chairman positions are vacant, a member of the panel of vice chairpersons cannot preside over the House.**
- During that time, the Chairman's responsibilities are to be carried out by any member of the House that the President may appoint for the purpose.
- To fill the vacated positions, elections are held as quickly as practicable.

17. Article 356

Section: Federalism

Concept:

- Prime Minister Narendra Modi recalled in Rajya Sabha that Congress governments at the Centre had dismissed 90 state governments by “**misusing**” **Article 356 of the Constitution**, and that former PM Indira Gandhi had “misused” it 50 times to dismiss elected state governments.

Article 356 of the Constitution

- **Article 356 of the Constitution** of India gives President of India the power to suspend state government and impose President's rule of any state in the country “if he is satisfied that a situation has arisen in which the government of the state cannot be carried on in accordance with the provisions of the Constitution”.
- Whether the constitutional machinery has broken down may be determined by the President at any time, **either upon receipt of a report from the Governor, or suo motu.**
- It is also known as ‘**State Emergency**’ or ‘**Constitutional Emergency**’.

Origin of the article

- Article 356 was inspired by **Section 93 of the Government of India Act, 1935.**
- This provided that if a **Governor of a province was satisfied that a situation had arisen in which the government of the province cannot be carried on in accordance with the provisions of the said Act**, he could **assume to himself all or any of the powers** of the government and discharge those functions in his discretion.
- The Governor, however, **could not encroach upon the powers of the high court.**

Implications:

- Upon the imposition of this rule, there **would be no Council of Ministers.**
- Imposition of president rule, does not dissolves the legislature of the state automatically as in the case of the council of ministers.
- The state will fall under the direct control of the Union government, and the Governor will continue to head the proceedings, representing the President of India.

Parliamentary Approval and Duration:

- A proclamation imposing **President's Rule must be approved by both the Houses of Parliament within two months from the date of its issue.**

- The approval takes place **through simple majority in either House**, that is, a majority of the members of the House present and voting.
- **Initially valid for six months**, the President's Rule can be **extended for a maximum period of three years** with the **approval of the Parliament, every six months**.

Report of the Governor:

- Under Article 356, President's Rule is imposed if the President, **upon receipt of the report from the Governor of the State or otherwise**, is satisfied that a situation has arisen in which the government of the State cannot be carried on in accordance with the provisions of the Constitution.

Revocation:

- A proclamation of President's Rule may be revoked by the **President at any time by a subsequent proclamation**.
- Such a proclamation does not require parliamentary approval.

Article 356 And Its Misuse

- Even though B.R. Ambedkar had assured that it would remain a dead letter, Article 356 has been used / misused more than 125 times.
- In almost all cases it was used for political considerations rather than any genuine breakdown of constitutional machinery in the States.
- Until 1959, Jawaharlal Nehru's government had used the article six times, including to dislodge the first-ever elected communist government in the world, in Kerala in 1959.
- In the 1960s, it was used 11 times. After Indira came to power in 1966, Article 356 was used seven times between 1967 and 1969 alone.
- The 1970s were more politically turbulent. Between 1970 and 1974, President's Rule was imposed 19 times. Post Emergency, the Janata Party government used it in 1977 to summarily dismiss nine Congress state governments.
- When Indira returned to power in 1980, her government too imposed President's Rule in nine states.
- In 1992-93, Prime Minister Narasimha Rao dismissed three BJP governments in the wake of the demolition of Babri Masjid, besides Kalyan Singh's government in UP.

Article 356 And Safeguards

- The **1994 Supreme Court (S.R. Bommai case) majority decision**, in essence, **overturned a long tradition that the use of Article 356 was not really subject to judicial review**.
- The Bommai case verdict laid down the conditions **under which State governments may be dismissed, and mechanisms for that process**.
- In the **R. Bommai case**, a nine-member bench of the Supreme Court construed the scope of Article 356, which also **allows the imposition of President's Rule in the States, with stringent conditions**.
- The court held that **Article 356 can be invoked in situations of the physical breakdown of the government or when there is a 'hung assembly'**, but that it **cannot be used without giving the state government a chance to either prove its majority** in the House or without instances of a violent breakdown of the constitutional machinery.
- These included ascertaining whether objective conditions exist which render it impossible to carry out governance in the State where the proclamation has been made and the **process has to be approved by both Houses of Parliament before consideration for judicial review**.
- **Since the judgment, the arbitrary use of Article 356 has been largely controlled.**

18. Article 105 of Constitution

Section: Parliament

Concept :

- Protesting against the expunction of parts of his speech on the motion of thanks on the President's Address, Leader of Opposition in Rajya Sabha and Congress president Mallikarjun Kharge has **argued that MPs have freedom of speech, and that he did not make any personal allegations in the House**.

Origin of Parliamentary Privileges

- The **Government of India Act, 1935** first brought this provision to India, with references to the powers and privileges enjoyed by the House of Commons in Britain.
- An initial draft of the Constitution too contained the reference to the House of Commons, but it was subsequently dropped.

Parliamentary Privileges

- Parliamentary privileges **are special rights, immunities and exemptions** enjoyed by the **two Houses of Parliament, their committees and their members**.
- These privileges are defined in **Article 105 of the Indian Constitution**.
- **Article 105 of the Constitution** expressly mentions two privileges, that is, **freedom of speech in Parliament and right of publication of its proceedings**.

- Apart from the privileges as specified in the Constitution, **the Code of Civil Procedure, 1908, provides for freedom from arrest and detention of members** under civil process .
- The privileges are claimed only when the person is a member of the house. As soon as s/he ends to be a member, the privileges are said to be called off.
- This immunity **extends to certain non-members as well**, such as the **Attorney General of India or a Minister who may not be a member but speaks in the House**.
- **Parliament has not made any special law** to exhaustively **codify all the privileges**. They are rather based on five sources:
 - Constitutional provisions
 - Various laws made by Parliament
 - Rules of both the Houses
 - Parliamentary conventions
 - Judicial interpretations.

Freedom of Speech in Parliament:

- The freedom of speech and expression guaranteed to a citizen under Article 19(2) is different from the freedom of speech and expression provided to a member of the parliament.
- It has been **guaranteed under Article 105(1) of the Indian constitution**. But the freedom is subject to rules and orders which regulate the proceedings of the parliament.

Limitations:

- Freedom of speech should be in accordance with the constitutional provisions and subject to rules and procedures of the parliament, as stated **under Article 118** of the Constitution.
- Under **Article 121 of the Constitution**, the members of the parliament are restricted from discussing the conduct of the judges of the Supreme Court and the High Court.

Freedom from Arrest:

- The members enjoy freedom **from arrest in any civil case 40 days before and after the adjournment** of the house and **also when the house is in session**.
- No member can be arrested from the limits of the parliament without the permission of the house to which s/he belongs so that there is no hindrance in performing their duties.
- If the detention of any members of the parliament is made, the chairman or the speaker should be informed by the concerned authority, of the reason for the arrest.
- But a member can be arrested outside the limits of the house on criminal charges against him under the Preventive Detention act, the Essential Services Maintenance Act (ESMA), the National Security Act (NSA), or any such act.

SC Observation :

- A five-judge Bench of the apex court ruled that the **ordinary law would not apply to the acceptance of a bribe by an MP in case of parliamentary proceedings**.
- “Broadly interpreted, as we think it should be, Article 105(2) protects a Member of Parliament against proceedings in court that relate to, or concern, or have a connection or nexus with anything said, or a vote given, by him in Parliament,” the court said, giving a **wider ambit to the protection accorded under Article 105(2)**.
- **In July 2021, the Supreme Court rejected** Kerala government’s plea to withdraw criminal cases against its MLAs who were charged in the assembly.
- **The Supreme court stated that Parliamentary Privileges are Not Gateways of Immunity** and the legislators who indulge in vandalism and general mayhem cannot claim parliamentary privilege and immunity from criminal prosecution.

Right to Prohibit the Publication of Proceedings:

- **Article 105 (2) of the Constitution**, no person shall be held liable for publishing any reports, discussions etc. of the house under the authority of the either house of parliament.
- For paramount and national importance, it is essential that the proceedings should be communicated to the public to aware them of what is going on in the parliament.

Collective privileges of the house:

- Various privileges such as **internal autonomy, power to punish for contempt in case of breach of privileges** and also **external interferences by strangers, freedom of speech in the debates, and the passing of resolutions** expressing the collective opinion of the members for the public interest, rule-making powers, etc. can be enjoyed collectively by the House itself.

19. Can’t ask collegium to rethink decision while applying judicial review: SC

Section: Judiciary

Concept:

- Supreme Court said on Friday while holding that it cannot quash the recommendation or call upon its collegium to reconsider its decision on appointment of judges while exercising power of judicial review.
- The apex court, which had on February 7 refused to entertain two petitions seeking to restrain Lekshmana Chandra Victoria Gowri from taking oath as an additional judge of the Madras High Court, on Friday gave the reasons for dismissing the pleas.
- The court said the question whether Ms. Gowri was “fit” to be a judge was outside the ambit of judicial review.
- The question **whether a person is fit to be appointed as a judge essentially involves the aspect of suitability and stands excluded from the purview of judicial review**, it noted.

Question of Eligibility and Suitability

- The Bench distinguished **between ‘suitability’ and ‘eligibility’ of a candidate** zeroed in for High Court judgeship.
- **Eligibility was based on “objective factors” given in Article 217 (2) of the Constitution** like citizenship and 10 years ‘experience as a judicial officer or a lawyer in a High Court.
- **Suitability of a candidate was the domain of the Collegium** as it involved a procedure “designed to test the fitness of a person, including her character, integrity, competence and knowledge”.
- **This aspect of suitability and stands excluded from the purview of judicial review.**

Judicial Review:

- It is a type of court proceeding in which a judge reviews the lawfulness of a decision or action made by a public body.
- In other words, judicial reviews are a challenge to the way in which a decision has been made, rather than the rights and wrongs of the conclusion reached.

Concepts of Law:

- **Procedure Established by Law:** It means that a law enacted by the legislature or the concerned body is valid only if the correct procedure has been followed to the letter.
- **Due Process of Law:** It is a doctrine that not only checks if there is a law to deprive the life and personal liberty of a person but also ensures that the law is made fair and just.
- India follows Procedure Established by Law.
- It is the power exerted by the courts of a country to examine the actions of the legislatures, executive and administrative arms of government and to ensure that such actions conform to the provisions of the nation’s Constitution.
- Judicial review has two important functions, like, of legitimizing government action and the protection of constitution against any undue encroachment by the government.
- Judicial review is considered a basic structure of the constitution (Indira Gandhi vs Raj Narain Case 1975).
- Judicial review is also called the interpretational and observer roles of the Indian judiciary.
- Suo Moto cases and the Public Interest Litigation (PIL), with the discontinuation of the principle of Locus Standi, have allowed the judiciary to intervene in many public issues, even when there is no complaint from the aggrieved party.

Types of Judicial Review:

- **Reviews of Legislative Actions:** This review implies the power to ensure that laws passed by the legislature are in compliance with the provisions of the Constitution.
- **Review of Administrative Actions:** This is a tool for enforcing constitutional discipline over administrative agencies while exercising their powers.
- **Review of Judicial Decisions:** This review is used to correct or make any change in previous decisions by the judiciary itself.

20. LOK ADALAT

Section: Judiciary

Concept:

- Transwomen, acid attack survivors don new roles at first national Lok Adalat in Delhi’s courts.
- This is **the first Lok Adalat held this year by the Delhi State Legal Services Authority (DSLSA) at trial courts.**
- This year, **DSLSA** has asked trans people, acid attack survivors and people from disenfranchised communities to be a **part of court proceedings as associate members, who help a judge settle cases.**

Lok Adalat

- **Lok Adalat is one of the alternative dispute redressal mechanisms**, it is a forum where disputes/cases pending in the court of law or at pre-litigation stage are settled/ compromised amicably.
- The Lok Adalats are formed to fulfil the promise given by the preamble of the Indian Constitution– securing Justice – social, economic and political of every citizen of India.

Members of Lok Adalats

- The persons deciding the cases in the Lok Adalats are called the **Members of the Lok Adalats**, they have the **role of statutory conciliators only and do not have any judicial role**.
- Therefore, they can only persuade the parties to come to a conclusion for settling the dispute outside the court in the Lok Adalat and shall not pressurize or coerce any of the parties to compromise or settle cases or matters either directly or indirectly.
- The Lok Adalat **shall not decide the matter so referred at its own instance**, instead the same would be **decided on the basis of the compromise or settlement between the parties**.
- The members shall assist the parties in an independent and impartial manner in their attempt to reach amicable settlement of their dispute.

Constitutional basis:

- **Article 39A** of the Constitution provides for free legal aid to the deprived and weaker sections of the society and to promote justice on the base of equal opportunity.
- **Articles 14** of the Constitution also make it compulsory for the State to guarantee equality before the law.

Statutory provisions:

- Under the Legal Services Authorities Act, 1987 Lok Adalats have been given statutory status.
- The decision made by the Lok Adalats is considered to be a verdict of a civil court and is ultimate and binding on all parties.

No appeal:

- There is no provision for an appeal against the verdict made by Lok Adalat.
- But, they are free to initiate litigation by approaching the court of appropriate jurisdiction by filing a case by following the required procedure, in exercise of their right to litigate.

Court fee:

- There is no court fee payable when a matter is filed in a Lok Adalat.
- Note: If a matter pending in the court of law is referred to the Lok Adalat and is settled subsequently, the court fee originally paid in the court on the complaints/petition is also refunded back to the parties.

Nature of Cases to be referred to Lok Adalat:

- Any case pending before any court.
- Any dispute which has not been brought before any court and is likely to be filed before the court.
- Provided that any matter relating to an offence not compoundable under the law shall not be settled in Lok Adalat.

How to Get the Case Referred to the Lok Adalat for Settlement?

- The State Legal Services Authority or District Legal Services Authority as the case may be on receipt of an application from any one of the parties at a pre-litigation stage may refer such matter to the Lok Adalat for amicable settlement of the dispute for which notice would then be issued to the other party.

Types of Lok adalats

- The bodies that may organize Lok Adalats at such intervals and places to exercise their jurisdiction are as follows:
 - National Legal Service Authority
 - Supreme Court Legal Services Committee
 - State Legal Services Authority
 - High Court Legal Service Committee
 - District Legal Services Authority
 - Taluk Legal Services Committee.
- **Other types of Lok Adalats:** Permanent Lok Adalats and Mobile Lok Adalats.
- **Permanent Lok Adalats:**
- **Permanent Lok Adalats** have been set up as **permanent bodies with a Chairman and two members for providing compulsory pre-litigative mechanism** for conciliation and settlement of cases relating to **Public Utility Services** like transport, postal, telegraph etc.
- Here, even if the parties fail to reach to a settlement, the Permanent Lok Adalat gets jurisdiction to decide the dispute, provided, the dispute does not relate to any offence.
- Further, the Award of the Permanent Lok Adalat is final and binding on all the parties. The jurisdiction of the Permanent Lok Adalats is upto Rs. Ten Lakhs.
- The Lok Adalat may conduct the proceedings in such a manner as it considers appropriate, taking into account the circumstances of the case, wishes of the parties like requests to hear oral statements, speedy settlement of dispute etc.

Mobile Lok Adalats :

- It is organized in various parts of the country which travel from one location to another to resolve disputes in order to facilitate the resolution of disputes through this mechanism.

21. Governor sitting on EC opinion is unethical – Ex. CEC

Section: Parliament and State legislature

Concept:

- **Jharkhand Governor** Ramesh Bais being shifted to Maharashtra on Sunday, at least two former Chief Election Commissioners (CECs) said it was “unethical” and “unprecedented” that **he had not made public the poll panel’s August 2022 opinion in the office of profit matter against Chief Minister Hemant Soren till now.**
- The **EC had communicated its opinion**, on whether Soren should be disqualified or not, to Bais in August 2022.
- In October, Bais had set off speculation by saying publicly that he had sought a “second opinion”. But in a letter to Soren, the EC clarified in November that it had not received any such request.

Decision on questions as to disqualifications of members – Article 192

- (1) If any question arises as to whether a member of a House of the Legislature of a State has become **subject to any of the disqualifications** mentioned in clause (1) of article 191, the **question shall be referred for the decision of the Governor and his decision shall be final.**
- (2) Before giving any decision on any such question, the **Governor shall obtain the opinion of the Election Commission and shall act according to such opinion.**

Disqualifications as per Article 191 (1)

- A **person shall be disqualified for being chosen** as, and for being, a **member of the Legislative Assembly or Legislative Council** of a State:
 - if he **holds any office of profit** under the Government of India or the Government of any State specified in the First Schedule, other than an office declared by the Legislature of the State by law not to disqualify its holder;]
 - if he is of **unsound mind** and stands so declared by a competent court;
 - if he is an **undischarged insolvent**;
 - if he is **not a citizen of India**, or **has voluntarily acquired the citizenship** of a foreign State, or is under any acknowledgment of allegiance or adherence to a foreign State;
 - if he is **so disqualified by or under any law made by Parliament.**

22. President Murmu appoints new Governors in 13 states

Section: Federalism

Concept:

The Governor – Appointment

- President of India appoints the Governor of State by warrant under his hand and seal for a five-year term.
- The Governor is not directly elected by the people, and neither is he elected indirectly by a special electoral college.

Qualifications: The Indian Constitution specifies two basic qualities for the selection of a Governor.

1. He should be an Indian citizen.
2. He must be at least 35 years old.

Over time, the following conventions have emerged:

1. He should be an outsider who does not reside in the state where he will be appointed.
2. When appointing the Governor of a state, the President must consult with the state’s Chief Minister.

Constitutional Position: The provisions of Articles 154, 163, and 164 of the Constitution empower the constitutional post of Governor.

- **Article 153** of the Indian Constitution mandates the appointment of a Governor in each state. The 7th Amendment to the Constitution however, allows for the appointment of the same person as Governor of two or more states.
- **Article 154:** The Governor shall have executive power over the state, which he shall exercise either directly or through officers subordinate to him in conformity with this Constitution.
- **Article 163:** There shall be a council of ministers, led by the Chief Minister, to assist and advise the Governor in the exercise of his powers, except when he is compelled to execute his functions at his discretion.
- **Article 164:** The council of ministers is collectively responsible to the state’s legislative assembly. This provision is the cornerstone of the state’s parliamentary system of governance.
- The Governor has the same Executive, Legislative, Financial, and Judicial authorities as the President of India. However, the Governor’s power is restricted in several ways compared to that of the President, as the Governor lacks the President’s military, diplomatic, and emergency authorities

23. Supreme Court dismisses Plea challenging Delimitation in Jammu and Kashmir

Section: Elections

Concept:

- The Supreme Court dismissed a challenge to the Constitution of the Jammu and Kashmir Delimitation Commission to readjust constituencies in the new Union Territory.
- The petition had contended that the **delimitation exercise was in violation of Article 170(3) which had frozen delimitation till the first census after 2026.**
- The petitioners had argued that delimitation cannot happen on the basis of the 2011 Census but must be carried out as per the 2001 Census or await “the first census after the year 2026”.

Supreme Court’s Judgement:

- On the legality of the Delimitation Commission for J&K, the two-judge bench of the Supreme Court said “the **J&K Reorganisation Act**, which created the two new Union territories, **assigns the role of readjustment of constituencies to the Delimitation Commission under the Delimitation Act, 2002**”.
- The Court said that **Article 4 of the Constitution permits the Parliament to incorporate such provisions in the law made in accordance with Article 3 for the formation of new States and Union territories**, which may be necessary to give effect to the provisions of the law.
- Such a law may also contain provisions as to representations in Parliament and in the Legislature of the State or States affected by such law.
- Therefore, such law which is made under Article 3 can always provide for readjustment of the Constituencies in the newly constituted States or Union territories through the Delimitation Commission.
- Hence, the Court held that **there is no illegality associated with the establishment of the Delimitation Commission for J&K.**

Constitutional Provisions:

- **Article 82 and Article 170 of the Constitution empowers the Parliament to readjust the allocation of seats in the Lok Sabha and the Legislative Assemblies of States respectively, after every census.**
- Accordingly, the Parliament **enacts a Delimitation Commission Act** and an independent high-powered panel known as the **Delimitation Commission** is constituted to carry out the exercise of delimitation.
- The Parliament has enacted the **Delimitation Commission Acts in 1952, 1962, 1972 and 2002 for this purpose.**
- There was **no Delimitation Commission Act after the 1981 and 1991 census.**
- The present delimitation of constituencies has **been done on the basis of 2001 census data** under the provisions of Delimitation Commission Act, 2002.
- The next Delimitation Commission **will be set up after 2026.**
- Further, **Article 330 and Article 332** of the Constitution provide for re-fixing the number of seats reserved for Scheduled Castes (SCs) and Scheduled Tribes (STs) in the Lok Sabha and the Legislative Assemblies of the states, on the basis of the 2001 census.

About Delimitation Commission:

- The Delimitation Commission is a **high-powered committee** entrusted with the task of **drawing and redrawing of boundaries of different constituencies** for state assembly and Lok Sabha election.
- It is **appointed by the President** and works in **collaboration with the Election Commission.**
- The Commission consists of –
 - A retired or working Supreme Court Judge (chairperson)
 - Election Commissioner
 - Concerned State Election Commissioners
- The Commission’s orders have the force of law and **cannot be called in question before any court.**

Delimitation Commission for Jammu & Kashmir:

- In the erstwhile state of Jammu and Kashmir, the delimitation of Lok Sabha seats was governed by the Indian Constitution, but the **delimitation of its Assembly seats was governed separately by the Jammu and Kashmir Constitution.**
- But **after the abrogation of Article 370 on August 5, 2019, Jammu and Kashmir lost its special status** and became a Union Territory.
- In **March 2020, the Union government set-up a Delimitation Commission which was tasked with delimitation in J&K and four north-eastern states** – Assam, Manipur, Arunachal Pradesh and Nagaland, which was supposed to be completed in a year.
- However, due to Covid-19 pandemic, the Commission had been given an extension of one year.
- It will be only after the completion of the delimitation exercise that elections for the J&K Legislative Assembly can be held.

24. House rules and the weapon of expunction

Section: Parliament

Concept:

- The **expunction of portions of the speeches** made by Opposition politicians in Parliament recently has sparked off a debate on an **action taken by the Speaker and the Chairman of the Rajya Sabha**.

Rules of the house

- **Article 105 of the Constitution** confers on members, freedom of speech in the House and immunity from interference by the court for anything said in the House.
- **Rule 380 of the Rules of procedure of the Lok Sabha and Rule 261 of the Rules of the Rajya Sabha** give the power to the **presiding officers of these Houses to expunge any words used in the debate which are defamatory, unparliamentary, undignified or indecent**.
- **Once expunged they do not remain on record.**
- If anyone publishes them thereafter, they will be **liable for breach of privilege of the House**.
- **Rule 353 of the Lok Sabha** regulates the **procedure in that regard**.
- MPs are required to give “**adequate advance notice**” to the Speaker as well as the Minister concerned.
- **Rule does not prohibit the making of any allegation.**
- The **only requirement is advance notice**: Minister concerned will conduct an inquiry into the allegation
- The allegation which necessitates advance notice, is of a defamatory or incriminatory nature.
- If the allegation is neither defamatory nor incriminatory, the above rule would have no application.
- The **rule does not apply to an allegation against a Minister in the government**.
- The Council of Ministers is accountable to Parliament, the **Members of the House have the right to question Ministers and make imputations against their conduct** as Ministers.

Procedure while making an allegation against a Minister:

- Such a procedure has been laid down by Speakers in the past.
- **Making an allegation against a Minister or the Prime Minister:** The MP who makes an imputation against a Minister of the government should be sure about the factual basis of the allegation, and that he must take responsibility for it.
- If the MP complies with this stipulation, then the allegation will be allowed to remain on record.

Two rulings made by the Speakers on some occasions:

On **September 2, 1965 Prakash Vir Shastri, MP**, made personal allegations against Humayun Kabir, the then Minister for Education:

- Mere **report in a newspaper about anything does not give you the privilege** to raise it in the House.
- That is **not a sufficient basis for a member to make an allegation** against a Minister, member or other dignitaries.
- It is necessary to probe it further and satisfy oneself about it.

On **December 21 1981 in the Lok Sabha, Bapusaheb Parulekar, MP**, made a reference to an allegation against the then Railway Minister, Kedar Pande.

- The member should, before making an allegation in the House, **satisfy himself after making enquiries** that there is a basis for the allegation.
- The member should be **prepared to accept the responsibility for the allegation**
- The member should be prepared to **substantiate the allegation**.

25. The missing Deputy Speakers

Context: The Supreme Court on Monday issued notices to the Centre and five states — Rajasthan, Uttarakhand, Madhya Pradesh, Uttar Pradesh, and Jharkhand — over the failure to elect a Deputy Speaker.

A Bench led by **Chief Justice of India (CJI) D Y Chandrachud** sought responses on a PIL that contends that not electing a Deputy Speaker to the 17th (present) Lok Sabha, which was constituted on June 19, 2019, is “against the letter and spirit of the Constitution”.

The post has been lying vacant in the five state Assemblies as well, which were constituted between four years and almost one year ago, the plea states. (**Shariq Ahmed v. Union of India And Ors**)

Deputy Speaker:

Constitutional Provisions

- **Article 93** says “The House of the People shall, as soon as may be, choose two members...to be...Speaker and Deputy Speaker...and, so often as the office of Speaker or Deputy Speaker becomes vacant, the House shall choose another member...”
- Article 178 contains the corresponding position for Speaker and Deputy Speaker of the Legislative Assembly of a state.

Is it mandatory to have a Deputy Speaker?

- Constitutional experts point out that both Articles 93 and 178 use the word “shall”, indicating that the election of Speaker and Deputy Speaker is mandatory under the Constitution.

How soon must the Deputy Speaker be elected?

- “As soon as may be”, say Articles 93 and 178. But they do not lay down a specific time frame.
- In general, the practice in both Lok Sabha and the state Assemblies has been to elect the Speaker during the (mostly short) first session of the new House — usually on the third day after the oath-taking and affirmations over the first two days.
- The election of the Deputy Speaker usually takes place in the second session — and is generally not delayed further in the absence of genuine and unavoidable constraints.
- Rule 8 of The Rules of Procedure and Conduct of Business in Lok Sabha says the election of Deputy Speaker “shall be held on such date as the Speaker may fix”. The Deputy Speaker is elected once a motion proposing his name is carried in the House.
- Once elected, the Deputy Speaker usually continues in office for the entire duration of the House. Under Article 94 (Article 179 for state legislatures), the Speaker or Deputy Speaker “shall vacate his office if he ceases to be a member of the House...”. They may also resign to each other, or “may be removed from...office by a resolution of the House of the People passed by a majority of all the then members of the House”.

Do the powers of the Speaker extend to the Deputy Speaker as well?

- **Article 95(1)** says: “While the office of Speaker is vacant, the duties of the office shall be performed by the Deputy Speaker”.
- In general, the Deputy Speaker has the **same powers as the Speaker** when presiding over a sitting of the House. All references to the Speaker in the Rules are deemed to be references to the Deputy Speaker when he presides.
- It has been repeatedly held that **no appeal lies to the Speaker against a ruling given by the Deputy Speaker or any person presiding over the House in the absence of the Speaker.**

Other features

- Like the Speaker, the Deputy Speaker is also **elected by the Lok Sabha itself from amongst its members.**
- He is elected after the election of the Speaker has taken place. The **date of election of the Deputy Speaker is fixed by the Speaker.**
- Whenever the office of the Deputy Speaker falls **vacant**, the **Lok Sabha elects another member to fill the vacancy.**
- Like the Speaker, the Deputy Speaker **remains in office usually during the life of the Lok Sabha.**
- However, he may **vacate his office** earlier in any of the following three cases:
 - if he ceases to be a member of the Lok Sabha;
 - if he resigns by writing to the Speaker; and
 - if he is removed by a resolution passed by a majority of all the members of the Lok Sabha. Such a resolution can be moved only after giving 14 days’ advance notice.
- The Deputy Speaker **performs the duties of the Speaker’s office when it is vacant.** He also acts as the Speaker when the **latter is absent** from the sitting of the House.
- In both the cases, he assumes all the powers of the Speaker.
- He also presides over the joint sitting of both the Houses of Parliament, in case the Speaker is absent from such a sitting.
- It should be noted here that the **Deputy Speaker is not subordinate to the Speaker.** He is directly responsible to the House.
- The Deputy Speaker has **one special privilege**, that is, whenever he is **appointed as a member of a parliamentary committee, he automatically becomes its chairman.**
- Like the Speaker, the Deputy Speaker, **while presiding** over the House, **cannot vote in the first instance**; he can only exercise a casting vote in the case of a tie.
- Further, when a **resolution for the removal** of the Deputy Speaker is under consideration of the House, he **cannot preside** at the sitting of the House, though he may be present.
- When the **Speaker presides** over the House, the Deputy Speaker is **like any other ordinary member** of the House. He can speak in the House, participate in its proceedings and vote on any question before the House.
- The Deputy Speaker is entitled to a **regular salary and allowance fixed by Parliament, and charged on the Consolidated Fund of India.**
- Upto the 10th Lok Sabha, both the Speaker and the Deputy Speaker were usually from the ruling party. Since the 11th Lok Sabha, there has been a consensus that the **Speaker comes from the ruling party** (or ruling alliance) and the **post of Deputy Speaker goes to the main opposition party.**
- The Speaker and the Deputy Speaker, while assuming their offices, **do not make and subscribe any separate oath or affirmation.**

26. Tax devolution to states

Section: Federalism

Concept:

- The Centre's tax devolution to the States, which has been **consistently falling short of the Finance Commission's recommendation**, will hit a five-year low in FY24, according to an analysis of Budget 2023-24 by Emkay Global Financial Services.
- Tax devolution in FY24 is **estimated to hit a five-year low of 36.5 per cent**.
- The **14th Finance Commission** had recommended a **devolution of 42 per cent** of Central taxes to States, but after Jammu and Kashmir was carved out into two Union Territories, the **final report of the 15 th Finance Commission recommended the transfer of 41 per cent**.

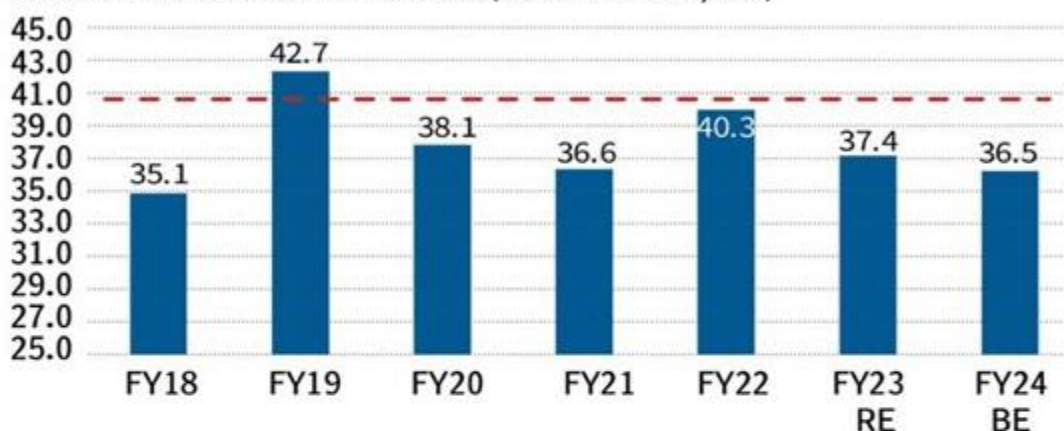
Reasons for Low tax devolution

- **Increasing cess & surcharges :**
- Decline in tax devolution is largely due to increasing cess and surcharges imposed by the Centre.
- Cess and surcharges are **part of central taxes but not part of the divisible tax pool** and do not have to be shared with States.
- In fact, cess and surcharge has grown at a faster pace than gross tax revenues.
- The **15 th Finance Commission** said that the divisible pool, as a percentage of the gross revenues of the Union, has been consistently falling as more and more resources are raised through non-shareable cesses and surcharges.
- Total 15th Finance Commission transfers (devolution + grants) **constitutes about 34% of estimated Gross Revenue Receipts to the Union**.

Shrinking pool

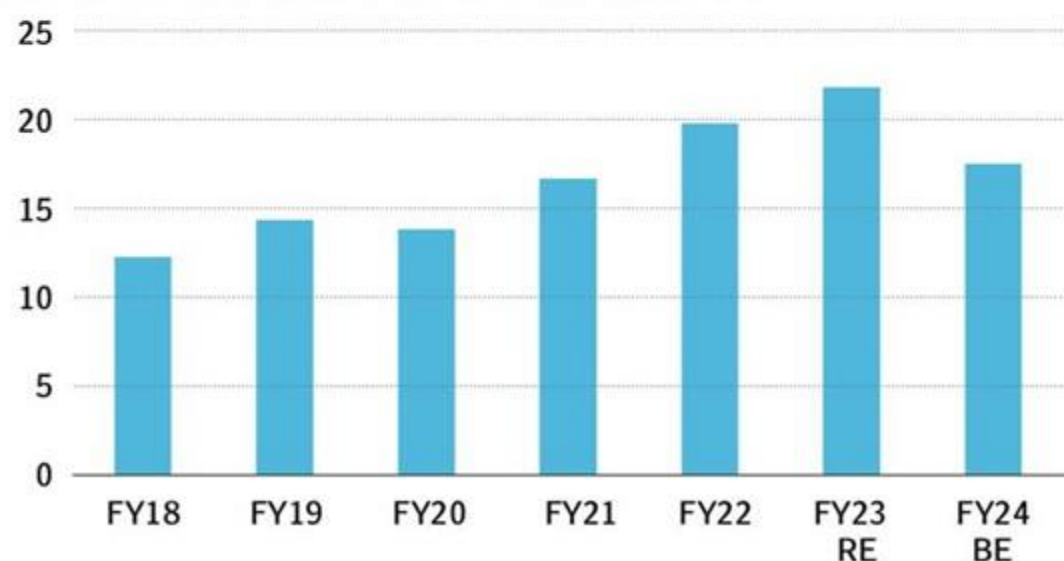
Tax devolution remains well below FC recommendation

Centre's tax devolution to States (% of divisible pool)



Cess and surcharges have been gaining importance in GRR

Cess and surcharge/Gross revenue receipts (%)



Source: Emkay Global Financial Services

- **Discontinuation of GST compensation :**
- Other reason for the Centre's devolution coming down in FY24 could be the **discontinuation of compensation for States** (to be paid to states to meet the shortfall in indirect tax revenue below a specified threshold, due to the introduction of GST) **ending in June 2022.**
- Going ahead, the **compensation cess will be used for servicing debt that the Centre took on behalf of the States** during the Covid-19 pandemic. For FY24, market loans worth ₹78,100 crore are due for redemption.

What is Tax Devolution?

- Tax Devolution is to make **recommendations for distributing the net proceeds of taxes between the Union and the states.**
- It is **one of the key responsibilities of a finance commission** according to **Article 280 (3) (a) of the Constitution.**
- **Vertical Devolution:** distribution of net taxable income between the Union and states.
- **Horizontal Devolution:** distribution of net taxable income between the states.

Allocation to states

- Central transfers to states include devolution from a **divisible pool of taxes, transfers towards Centrally Sponsored Schemes, Finance Commission grants, other transfers and capex loans.**
- Of these, **tax devolutions accounts for over 70 per cent .**
- Tax devolved to States are untied funds and hence **states are free to spend them as per their discretion.**

Finance Commission Grants

- **Revenue Deficit Grants to States:**
 - Revenue deficit grants emanate from the **requirement to meet the fiscal needs of the States on their revenue accounts** that remain to be met, even after considering their own tax and non-tax resources and tax devolution to them.
 - Revenue Deficit is defined as the difference between revenue or current expenditure and revenue receipts, that includes tax and non-tax.
- **Performance Based Incentives and Grants to States:**
 - These grants revolve **around four main themes.**
 - The first is the **social sector**, where it has focused on health and education.
 - Second is the **rural economy**, where it has focused on agriculture and the maintenance of rural roads.
 - Third, **governance and administrative reforms** under which it has recommended grants for judiciary, statistics and aspirational districts and blocks.
 - Fourth, it has developed a **performance-based incentive system** for the **power sector**, which is not linked to grants but provides an important, additional borrowing window for States.
- **Grants to Local Governments:**
 - Along with grants for municipal services and local government bodies, it includes performance-based grants for incubation of new cities and health grants to local governments.
 - In grants for Urban local bodies, basic grants are proposed only for cities/towns having a population of less than a million. For Million-Plus cities, 100% of the grants are performance-linked through the Million-Plus Cities Challenge Fund (MCF).
- **Statutory Grants:**
 - Article 275 authorizes **Parliament to offer grants to states in need of financial help, rather than to all states.** Every year, these funds are charged to India's Consolidated Fund.
 - Aside from this basic provision, the Constitution also provides for specific funds to promote the welfare of scheduled tribes in a state or to improve the standard of administration in scheduled areas in a state, such as Assam.
 - The **Finance Commission recommends the states that receive statutory grants** (both general and particular) under Article 275.

27. EC raps Congress, BJP for campaign on Twitter during polling in Tripura

Section: Elections

Concept:

- The Chief Electoral Officer (CEO) of Tripura on Thursday issued notices to the State units of the Congress and the Bharatiya Janata Party (BJP) as well as BJP national general secretary DilipSaikia for seeking votes on Twitter when polling was under way in the northeastern State.
- The Election Commission (EC) said the tweets are **violative of election law as they were posted in the 48 hour "silence period"**.

Silence Period

- Election silence is observed for a period of 48 hours until the conclusion of the polling, as per Section 126 of the Representation of People Act, 1951.
- The **'Silence Period' is basically a ban imposed by the ECI** which prevents political parties from engaging in election campaigning prior to voting.

Section 126 (l)(b) of the Representation of the People Act, 1951

- It prohibits **display to the public any election matter** by means of cinematograph, television or other similar apparatus in the **polling area during the period of 48 hours ending with the hour fixed for the conclusion of the poll** for any election in that polling area.

28. SC to pronounce order on whether a speaker on notice can disqualify legislators

Section: Parliament

Concept:

- The Supreme Court is scheduled on Friday to pronounce its order on the question of whether a seven judge Bench should reexamine its 2016 decision that a Speaker under a cloud should first clear his name before hearing disqualification petitions against legislators under the anti-defection law.

Background

- In 2016, a majority judgment of the Supreme Court in the **Nabam Rebia case** had held that a **Speaker or Deputy Speaker facing notice of removal cannot decide disqualification proceedings against legislators.**

Nabam Rebia ruling

- The Supreme Court held that it is “**constitutionally impermissible**” for a **speaker to proceed with disqualification proceedings**, if a **notice of removal against him is pending.**
- If a Speaker truly and rightfully enjoys support of the majority of the MLAs, there would be no difficulty whatsoever, to demonstrate the confidence which the members of the State Legislature, repose in him.
- This **ruling gave a window to defecting legislators to stall or circumvent the Tenth Schedule by seeking removal of the Speaker** when disqualification proceedings are anticipated — effectively tying the hands of the Speaker.
- Since 2016, this legal route has been a familiar playbook for legislators cutting across states and political affiliations.

Notice for removal of Speaker

- Under **Article 179 of the Constitution**, a **Speaker can be removed by a resolution of the Assembly passed by a majority of “all the then members of the Assembly”.**
- The process begins with **notice of at least 14 days.**
- In the 2016 Nabam Rebia ruling, the Supreme Court interpreted Article 179, specifically the term “all the then members of the Assembly”, to mean the composition of the house at the date/time of giving the notice for the removal of the Speaker.
- **No change on composition of the house :**
- This interpretation would mean that the **composition of the Assembly cannot be changed from the date of issuing of a notice of the removal of the Speaker**, and therefore the Speaker cannot make any decisions under the Tenth Schedule to change the composition of the House until the question of his removal is settled.
- **Rationale behind SC ruling :**
- The Supreme Court’s reasoning in barring the Speaker from acting under the Tenth Schedule when a notice for his own removal is pending, is to ensure that the Speaker who disqualifies legislators must enjoy the confidence of the Assembly.

29. EC recognizes Shinde faction as real Shiv Sena

Section: Elections

Concept:

- The Election Commission decided that the Shiv Sena faction led by Maharashtra Chief Minister Eknath Shinde was the real Shiv Sena as opposed to the group led by former CM Uddhav Thackeray.
- It said the party name and symbol of ‘Bow and Arrow’ would be retained by the Shinde group.
- The EC ruling comes at a time when the **Supreme Court is still to decide on the dispute over the powers of the Deputy Speaker to disqualify rebel Shiv Sena MLAs** when a notice for his own removal has been given.

Fight for symbol when party splits

- When a prominent party splits, a tussle often ensues for its election symbol. This symbol is frequently considered as the embodiment of the identity of the party.
- **Examples:** In October 2021, the ECI had frozen the ‘Bungalow’ election symbol of the Lok Janshakti Party (LJP). The LJP had split in June 2021.
- Before that, tussles over the election symbol had been witnessed in 2017 after the Samajwadi Party (Cycle) and the AIADMK (Two leaves) split.

How does the ECI decide who gets the symbol?

- It is decided as per the **provisions of the Symbols (Reservation and Allotment) Order, 1968.** This rule **applies to disputes in recognised national and state parties.**
- Para 15 of the Symbols Order, 1968 empowers EC to decide on the claim of rival factions in case of split.
- EC decides on the issue after taking into account all the available facts and circumstances of the case and hearing their representatives.
- The decision of the Commission **shall be binding on all such rival sections or groups.**
- **For splits in registered but unrecognised parties**, the ECI usually advises the warring factions to resolve their differences internally or to approach the court.

Other ways apart from the test of majority

- In almost all disputes decided by the EC so far, a clear majority of party delegates/office bearers, MPs and MLAs have supported one of the factions.
- Whenever the EC could not test the strength of rival groups based on support within the party organisation (because of disputes regarding the list of office bearers), it **fell back on testing the majority only among elected MPs and MLAs.**

What happens to the group that doesn’t get the parent party’s symbol?

- Before 1997, EC used to recognise the party, not getting the symbol, based on the criteria fixed for recognition of parties under Paras 6 and 7 of the Symbols Order.
- i.e., if the breakaway party had support of sufficient MPs/MLAs as per the criteria, it was recognised by EC as National/State Party.
- The **EC in 1997 felt that merely having MPs and MLAs is not enough**, as the elected representatives had fought and won polls on tickets of their parent (undivided) parties.
- The **EC introduced a new rule under which the splinter group of the party** — other than the group that got the party symbol — **had to register itself as a separate party**.
- These **parties could lay claim to national or state party status only on the basis of its performance in state or central elections after registration**.

EC decision on this case

- EC analysed three tests mentioned in the Sadiq Ali case, 1972
- The three tests were:
 - **Test of Aims and Objects of the Party**
 - **Test of Party Constitution, and**
 - **Test of Majority**
- **EC held that the Test of Party Constitution for determining the present dispute case will be undemocratic**
- While refusing to apply this test, EC held the 2018 changes to the Shiv Sena party constitution as undemocratic since the party has not submitted an amended copy of its constitution.
- EC was of the view that if such test is applied in the present case, it would be catalytic in spreading such practices across parties.
- Majority in organisational party structure was inconclusive
- The details of organisational structure were not mentioned by any of the faction.
- Hence, **proving the test of majority in organisational party structure was inconclusive**.
- **Finally, EC used the test of majority in the legislative wing of the party.**
- Since, the test of majority in organisational party structure was inconclusive, EC had to resort to the test of majority in the legislative wing of the party.
- This test showed qualitative superiority to the Shinde faction which has support of 40 out of 67 Sena MLAs & MLC and 13 out of 22 Sena MPs.

30. MHA designates two outfits as terror organisation

Section : Msc

Concept :

- The Central Government declared two organizations as terrorist organizations under the provisions of the UAPA

Terrorist Organisations

- **Khalistan Tiger Force (KTF)**: It is a militant outfit and it aims to revive terrorism in Punjab and challenges the territorial integrity, unity, national security and sovereignty of India and promotes various acts of terrorism, including targeted killings in Punjab.
- **Jammu and Kashmir Ghaznavi Force (JKGF)**: It has been found involved in infiltration bids, narcotics and weapon smuggling and carrying out terror attacks in the Union territory of Jammu and Kashmir.
- It draws its cadres from various terrorist organisations, such as Lashker-E-Taiba, Jaish-E-Mohammed, Tehreek-ul-Mujahideen, Harkat-ul-Jihad-E-Islami etc.
- With this, **now there are 54 designated terrorists and 44 designated terrorist organisations under the 1st Schedule of the UAPA.**

How does the government declare a terrorist organisation?

- In furtherance to India's Zero Tolerance policy towards terrorism, the Central Government amended the **Unlawful Activities (Prevention) Act (UAPA) in August 2019 to include the provision of designating an individual as terrorist.**
- Prior to this amendment, only organizations could be designated as terrorist organization.

Government measures to curb terrorism

- Constitution of a **Countering Financing of Terrorism Cell (CFT Cell)** in the Ministry of Home Affairs
- Constitution of a **Terror Funding and Fake Currency Cell** in the **National Investigation Agency**
- India organised the third **'No Money For Terror' Ministerial Conference in New Delhi**.

Kindly refer this article for notes on UAPA – <https://optimizeias.com/unlawful-activities-prevention-act/>

31. GST Appellate Tribunal (GSTAT)

Section: Federalism

Concept :

- The Goods and Services Tax (GST) Council recently accepted the Group of Ministers' (GoM) recommendations on long pending constitution of GST appellate tribunal in the country.

GST Appellate Tribunal (GSTAT):

- The Central Goods and Service Tax Act, 2017 (CGST Act) in **Section 109** mandates for the constitution of a GSTAT and its Benches.
- The GSTAT will be the **specialized appellate authority for resolving disputes under the GST laws**.

Composition:

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

32. National Land Monetisation Corporation (NLMC)

Section: National Organisation

Concept :

- The **National Land Monetisation Corporation (NLMC)** has decided to **utilise international property consultancy firms to help strategise and implement transactions** from start to finish and expedite the monetisation plans for government-owned land assets across the country.
- NLMC has now invited proposals from international property consultancy firms (IPCs) or other firms engaged in transaction advisory services, asset monetisation or project monetisation.

National Land Monetisation Corporation

- **NLMC was announced in the 2021-22 Union Budget.**
- National Land Monetisation Corporation is **steered by the Department of Public Enterprises to undertake monetisation of non-core assets such as surplus land and building assets of central public sector enterprises (CPSEs) and other government agencies.**
- The new company will have an **initial authorised share capital of ₹5,000 crore and paid-up share capital of ₹150 crore.**

Composition :

- The Board of Directors of NLMC will comprise senior Central Government officers and eminent experts to enable professional operations and management of the company.
- The chairman, non-government directors of the NLMC will be appointed through a merit-based selection process.

Functions:

- Government assets will be transferred to NLMC to hold, manage and monetise.
- Advise and support other government entities, including CPSEs, in identifying their surplus non-core assets and monetising them in a professional and efficient manner to generate maximum value realisation.
- NLMC will undertake surplus land asset monetisation as an agency function.
- NLMC will act as a repository of best practices in land monetisation, assist and provide technical advice to the government in implementation of the asset monetisation programme.

33. Sealed Cover Jurisprudence

Section: Judiciary

Concept :

- Recently, the Union government had proposed to offer suggestions in the sealed cover to the Supreme Court, in reference to the formation of a proposed committee to enquire into the Hindenburg report on the Adani Group.
- The Court, however, refused to accept the suggestions.

Sealed Cover Jurisprudence

- It is a practice used by the Supreme Court and sometimes lower courts, of asking for or accepting information from government agencies in sealed envelopes that can only be accessed by judges.
- There is **no law specifying the sealed cover jurisprudence** but the **SC derives its power from –**
- Rule 7 of Order XIII of the Supreme Court Rules and
- Section 123 of the Indian Evidence Act of 1872

- Under **Rule 7 of Order XIII** (“Copying”) of the **Supreme Court Rules, 2013**, if the **Chief Justice or court directs certain information to be kept under sealed cover or considers it of confidential nature**, no party would be allowed access to the contents of such information.
- Under **Section 123 of the Indian Evidence Act of 1872**, the unpublished **official documents about state affairs are given protection** and a public servant cannot be forced to disclose such information.

When can the Court ask for Information in a Sealed Cover?

- In **broadly two circumstances** – when **information is connected to an ongoing investigation**, and when it **involves personal or confidential information**.
- The logic is that disclosure of information linked to an ongoing investigation could impede the investigation.
- Also, the disclosure of personal or confidential information could violate an individual’s privacy or result in breach of trust.

Instances of Court using the Seal Cover Jurisprudence:

- Sealed cover jurisprudence has been frequently employed by Courts in the recent past.
- In the **case pertaining to the Rafale Fighter Jet deal**, a Bench headed by Chief Justice Ranjan Gogoi in 2018, had asked the Centre to submit details related to deal’s decision making and pricing in a sealed cover.
- This was done as the Centre had contended that such **details were subject to the Official Secrets Act and Secrecy clauses** in the deal.
- In the matters related to the **National Register of Citizens (NRC) in Assam**, the coordinator of the NRC, Prateek Hajela, was asked by the court to submit period reports in sealed cover, which could neither be accessed by the government nor the petitioners.
- In the **2014 BCCI reforms case**, the probe committee of the cricket body had submitted its report to the Supreme Court in a sealed envelope, asking it not to make public the names of nine cricketers who were suspected of a match and spot fixing scam.

Criticism of this Practice:

- Critics of this practice contend that it is **not favourable to the principles of transparency and accountability of the Indian justice system**.
- It **stands in contrast to the idea of an open court**, where decisions can be subjected to public scrutiny.
- It is also said to enlarge the scope for arbitrariness in court decisions, as judges are supposed to lay down reasoning for their decision. However, this cannot be done when they are based upon information submitted confidentially.
- It is argued that not providing access to such documents to the accused parties obstructs their passage to a fair trial and adjudication.
- In the **2019 judgment in the case of P Gopalakrishnan V. The State of Kerala**, the Supreme Court had said that **disclosure of documents to the accused is constitutionally mandated**.

34. Disqualification Of a Politician

Section :Parliament

Concept :

- Kerala High Court refuses to stay 10-year imprisonment against Lakshadweep Member of Parliament in an attempt to murder case.

Background:

- Earlier, the Kavaratti Sessions Court had convicted four persons, including Mohammed Faizal P.P. then sitting Member of Parliament (MP) of Lakshadweep for committing offences **punishable under Indian Penal Code (IPC) and sentenced to undergo 10 years of rigorous imprisonment**.
- On January 13, the **Lok Sabha announced the disqualification of Faizal as an MP** with effect from the date of conviction.
- On January 18, the Election Commission of India (ECI) fixed February 27 as the date for by-election to that constituency.
- An **appeal in Kerala High Court suspended his conviction and sentence on January 25**.
- The High Court suspended his conviction until disposal of the appeal.
- Faizal also challenged the ECI’s announcement in the Supreme Court of India due to which the ECI deferred the election.
- The elected candidate will have just 15 months to function till the end of the term of the current Lok Sabha.

Parliamentary Provisions for Disqualification of MPs

- In case an MP is convicted of any criminal offence, there are provisions in place for their disqualification from the parliament.
- **Section 8 of Representation of the People Act, 1951** provides that a person will be disqualified if **convicted and sentenced to imprisonment for two years or more**.
- The person is **disqualified for the period of imprisonment and a further six years**.

Other Parliamentary Provisions as per RPA Act, 1951 :

- He must not have been found guilty of certain election offences or corrupt practices in the elections.
- He must not have been convicted for any offence resulting in imprisonment for two or more years.
- But, the detention of a person under a preventive detention law is not a disqualification.
- He must not have failed to lodge an account of his election expenses within the time.
- He must not have any interest in government contracts, works or services.
- He must not be a director or managing agent nor hold an office of profit in a corporation in which the government has at least 25 per cent share.
- He must not have been dismissed from government service for corruption or disloyalty to the state.
- He must not have been convicted for promoting enmity between different groups or for the offence of bribery.
- He must not have been punished for preaching and practicing social crimes such as untouchability, dowry and sati.
- Note : **President's decision is final** regarding the disqualification of a member of either house of the Parliament.
- However the **President does take the opinion of the Election Commission** before taking a decision on disqualification and act accordingly.

Differential Treatment for sitting members:

- There is an exception for sitting members under Representation of the People Act, 1951
- **Sitting members have been provided a period of three months from the date of conviction to appeal; the disqualification will not be applicable until the appeal is decided.**
- The differential treatment of candidates for elections and sitting members was challenged under Article 14.
- The **Supreme Court** in **K. Prabhakaran vs P. Jayarajan 2005 case**, validated the differential treatment as the consequences of disqualifying a contestant and a sitting member were different.
- The disqualification of an MP or MLA has several implications for the functioning of the House and the political party to which the member belongs.
- The **disqualification of an MP or MLA leads to a by-election in the constituency represented by the disqualified member**. This not only entails additional expenditure for the government but also affects the political balance in the House.
- The Court also held that the removal of disqualification in case of acquittal of a candidate would be prospective and for future elections and not with retrospective effect as this would require the results of the election to be cancelled.
- **However, in 2013, a two-judge Bench of the Supreme Court in the Lily Thomas vs Union of India case** stated that the **conditions for disqualification would apply equally to candidates and sitting members**.
- Therefore, the **exception carved out for sitting members was unconstitutional**.
- The judgement cited **Article 101** that if a **Member of Parliament was disqualified under Article 102, "his seat shall thereupon become vacant"**.
- Therefore, the disqualification was automatic and had immediate effect if the conditions of Article 102 were met.
- The **judgement also stated that a disqualified person may obtain a stay on his conviction, and the disqualification would be removed from the date of the stay order.**

35. Indians go West, take up 'residence by investment'

Section: Constitution features

Concept :

- According to data tabled in Parliament by the Ministry of External Affairs (MEA) recently, over **25 lakh Indians renounced their Indian citizenship in 2022**, the highest number since 2011.
- The data shows how Indians, **particularly high-net-worth individuals (HNIs)**, are migrating westward with new passports in search of **better opportunities, healthcare, quality of life, and education, among other factors**.
- High-net-worth individuals are flocking for residence-through-investment schemes in the United States, Portugal, Australia, Malta, and Greece.
- There has been a surge in requests for **residence-through-investment programmes** especially for the **US EB-5 visa, Portugal Golden Visa, Australian Global Talent Independent Visa, Malta Permanent Residency Programme, and Greece Residence by Investment Program**.

Residence by investment programs

- **Residency by investment** – Residence by investment schemes offer people the chance to get a **residency permit for a country by purchasing a house there or making a large investment or donation**.
- It is otherwise known as **golden visa programs**.
- It give HNIs the option of physically relocating and becoming residents of a state with full legal rights, including the right to live, work, study, and receive healthcare in that country.

Citizenship renouncement in India

- Since India does not provide dual citizenship, therefore one has to renounce his/her Indian Citizenship for acquiring citizenship of another country.
- **Voluntary Renunciation:**
- If an Indian citizen wishes, who is of full age and capacity, he can relinquish citizenship of India by his will.

- When a person relinquishes his citizenship, every minor child of that person also loses Indian citizenship. However, when such a child attains the age of 18, he may resume Indian citizenship.
- **By Termination:**
- The Constitution of India provides single citizenship. It means an Indian person can only be a citizen of one country at a time.
- If a person takes the citizenship of another country, then his Indian citizenship ends automatically. However, this provision does not apply when India is busy in war.
- **Deprivation by Government:**
- The Government of India may terminate the citizenship of an Indian citizen if;
- The citizen has disrespected the Constitution.
- Has obtained citizenship by fraud.
- The citizen has unlawfully traded or communicated with the enemy during a war.
- Within 5 years of registration or naturalisation, a citizen has been sentenced to 2 years of imprisonment in any country.
- The citizen has been living outside India for 7 years continuously.

High net worth individuals (HNIs)

- HNIs are those who have wealth of over \$1 million or 8.2 crore.
- According to the Henley Global Citizens Report, there were 3.47 lakh such people in India in December 2021.
- Of these, 1.49 lakh HNIs were found in just nine cities: Mumbai, Delhi, Kolkata, Bengaluru, Hyderabad, Pune, Chennai, Gurgaon, and Ahmedabad.
- According to the report, India ranked fourth in the world in terms of privately-held wealth, after the U.S., China, and Japan

36. Waqf board moves HC against centre's decision

Section: Msc

Concept :

- The Delhi Waqf Board has moved the High Court against the Centre's decision to take over 123 Waqf properties, Board chairman Amanatullah Khan said.
- **Background :**
- The **Land and Development Office (L&DO) of the Ministry of Housing and Urban Affairs (HUA)** recently **decided to take over 123 properties of the Delhi Waqf Board**, including mosques, dargah and graveyards, based on the report of a two-member committee.
- Khan said the report of the committee was not shared with the Waqf Board, and added that a case challenging its formation was already pending in the Delhi High Court.

Waqf

- Property given in the name of God for religious and charitable purposes.
- In legal terms, permanent dedication by a person professing Islam, of any movable or immovable property for any purpose recognised by the Muslim law as pious, religious or charitable.

How is waqf created?

- A waqf can be formed through a deed or instrument, or a property can be deemed waqf if it has been used for religious or charitable purposes for a long period of time.
- The proceeds are typically used to finance educational institutions, graveyards, mosques and shelter homes.
- **A person creating the waqf cannot take back the property and the waqf would be a continuing entity.**
- The grant is known as **mushrut-ul-khidmat**, while a **person making such dedication is known as Wakif.**
- **A non-Muslim can also create a waqf but the individual must profess Islam** and the objective of creating the waqf has to be Islamic.

Waqf Board

- It is an **Indian statutory body** established in 1964 by the Government of India under the **Waqf Act, 1954 (now a subsection of the Waqf Act, 1995)** for the purpose of advising it on matters pertaining to the **working of the State Waqf Boards and proper administration of the Waqfs in the country.**
- It is headed by a Chairperson, who is the Union Minister in charge of Wakfs and there are maximum 20 other members, appointed by Government of India as stipulated in the Waqf Act.

37. Rajya Sabha Chairman tells panel to prove ' disorderly conduct ' of 12 MP's

Concept:

- Rajya Sabha Chairman recently asked the **committee of privileges to investigate the alleged breach of privilege by 12 opposition lawmakers** for repeatedly entering the well of the House, shouting slogans, and obstructing its proceedings.

About Committee of Privileges – Standing committee:

- This committee consists of 15 members in Lok Sabha (10 in case of Rajya Sabha) nominated by the Speaker (Chairman in case of Rajya Sabha).
- In the Rajya Sabha, the deputy chairperson heads the committee of privileges.

Powers and Functions:

- The committee examines every question involving a breach of privilege of the House or of the members or of any Committee thereof referred to it by the House or by the Speaker/Chairman.
- It also determines with **reference to the facts of each case whether a breach of privilege is involved and makes suitable recommendations** in its report.
- It also states the **procedure to be followed by the House in giving effect to its recommendations.**
- When a question of privilege is referred to the Committee by the House, the report of the Committee is presented to the House by the Chairman or, in his absence, by any member of the Committee.
- Where a question of privilege is referred to the Committee by the Speaker, the report of the Committee is presented to the Speaker who may pass final orders thereon or direct that it be laid on the Table of the House.
- The Speaker/Chairman may refer to the Committee any petition regarding the disqualification of a member on the ground of defection for making a preliminary inquiry and submitting a report to him.
- The procedure to be followed by the Committee in these cases is so far as may be the same as in applicable to questions of breach of privilege.

Standing Committees

- The **Standing Committees are permanent (constituted every year or periodically)** and work on a continuous basis.
- Standing Committees can be classified into the **following six categories**:
 - Financial Committees
 - Departmental Standing Committees
 - Committees to Enquire
 - Committees to Scrutinise and Control
 - Committees Relating to the Day-to-Day Business of the House
 - House-Keeping Committees or Service Committees.

38. Only Parliament can amend the law to provide a uniform marriage age

Section: Judiciary

Concept:

- The Supreme Court while dismissing a petition seeking to increase the minimum age of marriage of women from 18 to 21 has said **that only Parliament can amend the law to provide a uniform marriage age as it is left to the ultimate wisdom of the Parliament.**
- The Chief Justice of India D.Y. Chandrachud has held that it should not be perceived that the judiciary is the **exclusive custodian of the Constitution as the Parliament is equally the custodian of the Constitution.**
- The petitioner sought a legislative amendment to increase the minimum age of marriage to 21 years saying that the prescription of 18 years was arbitrary.
- However, according to the apex court, it is **trite law that the court in its exercise of Article 32 of the Constitution cannot issue a mandamus to the Parliament to legislate a matter entrusted to the Parliament or the State Legislatures to exercise power.**

Prerogative Writs

- **Mandamus is among the “prerogative writs”** in English common law — meaning the extraordinary writs or orders granted by the Sovereign when ordinary legal remedies are inadequate.
- These are **habeas corpus, mandamus, prohibition, certiorari, and quo warranto.**
- In India, the Supreme Court **can issue prerogative writs under Article 32** of the Constitution, and the High Courts under Article 226.

Mandamus

- Mandamus literally means ‘we command’. When **issued to a person or body, the writ of mandamus demands some activity on their part.**
- It orders the **person or body to perform a public or quasi-public duty, which they have refused to perform, and where no other adequate legal remedy exists to enforce the performance of that duty.**

When is it used?

- The writ **cannot be issued unless the legal duty is of public nature, and to whose performance the applicant of the writ has a legal right.**
- The **remedy is of a discretionary nature** — a court can refuse to grant it when an alternative remedy exists.

- However, for enforcing fundamental rights, the alternative remedy argument does not hold as much weight, since it is the duty of the Supreme Court and the High Courts to enforce fundamental rights.
- When a **public officer or government does an act that violates the fundamental right of a person, the court would issue a writ of mandamus against such authorities** so that the person's rights are not infringed.
- The writ can **also be issued against inferior courts or other judicial bodies** when they have refused to exercise their jurisdiction and perform their duty.

Limitations

- Under **Article 361, mandamus cannot be granted against the President or Governor of a State**, “for the exercise and performance of the powers and duties of his office or for any act done or purporting to be done by him in the exercise and performance of those powers and duties”.
- The writ **also cannot be issued against a private individual or body**, except where the State is in collusion with the private party for contravening a provision of the Constitution or a statute.

39. TRAI to issue consultation paper on digital inclusion

Section: National Body (Statutory)

Context: The Telecom Regulatory Authority of India (TRAI) will bring out a consultation paper to further strengthen digital inclusion in the country, and devices, connectivity and literacy will be the three key aspects it will dwell into

Concept:

Digital divide

- Digital divide is a term that refers to the **gap between demographics and regions that have access to modern information and communications technology**, and those that don't or have restricted access
- The digital divide typically **exists between those in cities and those in rural areas**; between the **educated and the uneducated**; between **socioeconomic groups**; and, globally, between the more and less industrially developed nations.
- According to CSC e-Governance Services India Ltd, a special purpose vehicle set up by the ministry of electronics and information technology, there has been a 100% surge in data consumption. There is a **rural-urban component to the digital divide**. Internet density in rural areas accounting for **66% of population** is around **25%**, while among urban population (34%), internet density is almost 98%.
- According to the Internet and Mobile Association of India, male users account for 67% of India's online population; women account for just **29%**.

About TRAI:

- The Telecom Regulatory Authority of India (TRAI) was established in 1997 by the **Telecom Regulatory Authority of India Act, 1997**.
- The head office of the Telecom Regulatory Authority of India (TRAI) is located at New Delhi.
- The TRAI consists of a **Chairperson, two whole-time members and two part-time members, all of which are appointed by the Government of India**.

Functions of TRAI:

- The function of the TRAI is to make recommendations to the central government on matters related to service providers, Revocation of license for non-compliance , Measures to facilitate competition and promote efficiency in the operation of telecommunication services to facilitate their growth etc.
- Laying down the standards of quality of service to be provided by the service providers.
- Timely and officially notifying the rates at which the telecommunication services within India and outside India shall be provided under the TRAI Act, 1997.
- The recommendations of the TRAI are not binding upon the Central Government.

Powers of TRAI:

- It can call upon any service provider **to furnish in writing the information** or explanation relating to its affairs as the Authority may require.
- The Authority may appoint one or more persons **to make an inquiry** in relation to the affairs of any service provider.
- It is empowered to direct any of its officers or employees **to inspect the books of accounts or other documents** of any service provider.
- The Authority shall have the power **to issue such directions to service providers** as it may consider necessary for proper functioning by service providers.

40. Children have a Right to protect their Genetic Information from DNA tests: SC

Section: Rights issues

Concept:

- The Supreme Court of India has ruled that children have the right to protect their genetic information from being revealed in DNA tests without their consent.
- The **court ruled that-**
 - Genetic information is personal and intimate
 - Children have the right to privacy and bodily integrity
 - Children are not to be regarded like material objects and should not become the focal point of the battle between spouses
 - Allowing DNA tests would also harm the reputation and dignity of the mother

Basis of this judgment

- The court drew **attention to the rights of privacy, autonomy and identity recognised under the United Nations' Convention on the Rights of the Child.**
- It acknowledged the control that **individuals, including children, have over their own personal boundaries** and the means by which they define who they are in relation to other people.
- Children are not to be deprived of this entitlement to influence and understand their sense of self simply by virtue of being children.

How can one get the tests done?

- Family courts **should direct for a DNA test only in expedient situations** and in the interest of justice, as a last resort, said the judgment.
- This should be practised as the **option of last resort.**

Right to protect Genetic Information

- The right to protect genetic information is a **fundamental right** that recognizes an **individual's autonomy and control over their own personal and intimate** genetic data.
- It allows individuals to make informed decisions about their health, privacy, and identity.
- In India, the Supreme Court has also held that children have the right to protect their genetic information from DNA testing in divorce proceedings, as it is part of their fundamental right to privacy.
- This is **guaranteed under Article 21 of Indian Constitution.**
- This right is recognized under various international human rights instruments, including the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights.

UN Convention on the Rights of the Child

- It is a treaty **adopted by the United Nations General Assembly in 1989.**
- It recognises a **child as every human being under 18 years old.**
- It is an international agreement that is **legally binding on the members.**
- It sets out the civil, political, economic, social and cultural rights of every child, regardless of their race, religion or abilities.
- It includes rights such as Right to Education, Right to Rest and Leisure, Right to Protection from Mental or Physical Abuse including Rape and Sexual Exploitation.
- It has been **ratified by all members of the UN except for the United States.**
- It is the **most widely ratified human rights treaty in the history of the world.**

Committee on the Rights of the Child

- The **Committee on the Rights of the Child (CRC)** is a body of experts that monitor and report on the implementation of the **United Nations Convention on the Rights of the Child.**
- The Committee also monitors the **Convention's three optional protocols:**
 - **the Optional Protocol on the Involvement of Children in Armed Conflict,**
 - **the Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography**
 - **Optional Protocol to the Convention on the Rights of the Child on a Communications Procedure**

41. A legislator has to obey party whip – Uddhav Thackeray tells SC

Section :Parliament and State legislature

Concept :

- A legislator has to obey the party whip and cannot diverge on his own, saying his constituency is disillusioned by the ruling party leadership, former Maharashtra Chief Minister Uddhav Thackeray argued in the Supreme Court on Wednesday.

About Whip

- A **whip is a directive from the party that binds party members of a House to obey** the line of the party.
- Though the office of whip is **not officially recognised in the standing orders**, there has been a **long tradition to give them a place in the Parliamentary form of government.**
- The whip plays a crucial role in ensuring the smooth and efficient conduct of business on the floor of the House.

- The whip is an MP/MLA drawn from the party that is in power and also from the party that sits on the opposition bench. They are vital in maintaining the links between the internal organisation of party inside the Parliament.
- It is also the **duty of the chief whip to maintain discipline of the party on the floor of the House**. Besides, he is responsible for keeping MPs, especially Ministers, informed of opinion in the party on the moods of individual members.
- If an MP/MLA violates his party's whip, he faces expulsion from the House under the Anti-Defection Act.
- **Constitutional status:** The office of 'whip', is **mentioned neither in the Constitution of India nor in the Rules of the House nor in a Parliamentary Statute**. It is **based on the conventions** of the parliamentary government.
- **Non-applicability of Whip:** There are some **cases such as Presidential elections** where **whips cannot direct** a Member of Parliament (MP) or Member of Legislative Assembly (MLA) on whom to vote.

42. Election Commission's has no power to decide on party's account and property

Section: Elections

Context: After the Election Commission's (EC) February 17 decision granting the Shiv Sena name and symbol to Maharashtra Chief Minister's faction, the next big question is who will control the party's properties and bank accounts.

Concept:

- The EC relied on the "test of majority". It is found based on the support of the majority of the MLAs, MLCs, and MPs.
- When the Commission ruled on a dispute between factions of the Congress in January 1971, it can only rule on the use of the registered name and symbol under the Election Symbols (Reservation and Allotment) Order, 1968

The Supreme Court, by upholding the EC decision in the Sadiq Ali case in November 1971, ruled,

- The claim made in this respect is only for the purpose of symbols in connection with the elections to Parliament and State Legislatures and the decision of the Commission pertains to this limited matter.
- The Commission while deciding the matter under Paragraph 15 does not decide disputes about property.
- The proper forums for adjudication of disputes about property are the Civil Courts.

Paragraph 15 of the EC order

- its power to decide disputes between splinter groups of a recognised political party is mentioned in para 15.
- When the Commission is satisfied on information in its possession that there are rival sections or groups of a recognised political party after verification, decide that **one such rival section or group or none of such rival sections** or groups is that recognised political party
- The decision of the Commission shall be binding on all such rival sections or groups.

EC officials said that the panel had no role in the matter. This matter can be decided by a civil court if either side decides to move it.

43. CAG of India selected as External Auditor of International Labour Organization

Section: National Body (Constitution)

Concept:

- CAG is an **independent authority under the Constitution of India**.
- He is the head of the **Indian audit & account department** and chief Guardian of public purse.
- It is the institution through which the accountability of the government and other public authorities (all those who spend public funds) to Parliament and State Legislatures and through them to the people is ensured.

Comparison with Britain CAG

- CAG of India only performed the role of an Auditor General and not of a Comptroller but in Britain it has the power of both Comptroller as well as Auditor General.
- In India the CAG audits the accounts after the expenditure is committed i.e. ex post facto. In UK no money can be drawn from the public exchequer without the approval of the CAG.
- In India, CAG is not a member of the parliament while in Britain; CAG is a member of house of the Commons.

Constitutional Provisions

- **Article 148** broadly deals with the CAG appointment, oath and conditions of service.
- **Article 149** deals with Duties and Powers of the Comptroller and Auditor-General of India.
- **Article 150** says that the accounts of the Union and of the States shall be kept in such form as the President may, on the advice of the CAG, prescribe.
- **Article 151** says that the reports of the Comptroller and Auditor-General of India relating to the accounts of the Union shall be submitted to the president, who shall cause them to be laid before each House of Parliament.
- **Article 279**— Calculation of "net proceeds" is ascertained and certified by the Comptroller and Auditor-General of India, whose certificate is final.

- **Third Schedule**— Section IV of the Third Schedule of the Constitution of India prescribes the form of oath or affirmation to be made by the Judges of the Supreme Court and the Comptroller and Auditor-General of India at the time of assumption of office.
- According to **Sixth Schedule** the accounts of the District Council or Regional Council should be kept in such form as CAG, with the approval of the President, prescribe. In addition these bodies account are audited in such manner as CAG may think fit, and the reports relating to such accounts shall be submitted to the Governor who shall cause them to be laid before the Council.

Independence of CAG

- CAG is appointed by the President by warrant under his hand and seal and provided with tenure of 6 years or 65 years of age, whichever is earlier.
- CAG can be removed by the President only in accordance with the procedure mentioned in the Constitution that is the manner same as removal of a Supreme Court Judge.
- He is ineligible to hold any office, either under the Government of India or of any state, once he retires/ resigns as a CAG.
- His salary and other service conditions cannot be varied to his disadvantage after appointment.
- His administrative powers and the conditions of service of persons serving in the Indian Audit and Accounts Department are prescribed by the President only after consulting him.

The administrative expenses of the office of CAG, including all salaries, allowances and pensions are **charged upon the Consolidated Fund** of India that is not subject to vote

Functions and Power of CAG

- CAG audits the accounts related to all expenditure from the Consolidated Fund of India, Consolidated Fund of each state and UT's having a legislative assembly.
- He audits all expenditure from the Contingency Fund of India and the Public Account of India as well as the Contingency Fund and Public Account of each state.
- He audits all trading, manufacturing, profit and loss accounts, balance sheets and other subsidiary accounts kept by any department of the Central Government and the state governments.
- He audits the receipts and expenditure of all bodies and authorities substantially financed from the Central or State revenues; government companies; other corporations and bodies, when so required by related laws.
- He audits the accounts of any other authority when requested by the President or Governor e.g. Local bodies.
- He advises the President with regard to prescription of the form in which the accounts of the Centre and States shall be kept.
- He submits his audit reports relating to the accounts of the Centre to the President, who shall, in turn, place them before both the houses of Parliament.
- He submits his audit reports relating to the accounts of a State to the Governor, who shall, in turn, place them before the state legislature.

CAG also acts as a **guide, friend and philosopher of the Public Accounts Committee** of the Parliament.

CAG and Public Accounts Committee (PAC)

- PAC is a Parliamentary Standing Committee created under GOI Act, 1919.
- CAG audit reports are handed over to the PACs at the centre and at the state.
- Three CAG reports i.e. audit report on appropriation accounts, audit report on finance accounts and audit report on public sector undertakings are examined by PAC.
- At the central level, these reports are submitted by CAG to president, who makes them to be laid in parliament.
- CAG also assists the committee in its deliberations by preparing a list of the most urgent matters which deserve the attention of the PAC.
- He also helps in making the actions of the committee clear to the witnesses and in making the action of the government clear to the committee.
- CAG position is sometimes one of interpreter and translator, explaining the officials' views to the politicians and vice-versa.
- The responsibility of the CAG does not end here. He has to watch whether the corrective action suggested by him has been taken or not. In cases whether it has not been taken, he reports the matter to the PAC which will take up the matter.

44. FSSAI notifies comprehensive group standards for millets

Section: National body

Concept:

- The Food Safety and Standards Authority of India (FSSAI) has specified a comprehensive group standard for millets w.e.f. 1st September 2023.
- It has notified **Food Safety and Standards (Food Products Standards and Food Additives) Second Amendment Regulations, 2023**.

About :

- **Currently, individual standards for only a few millets** like Sorghum (Jowar), whole and decorticated Pearl Millet grain (Bajra), Finger Millet (Ragi) and Amaranth **are prescribed by FSSAI in 2011.**
- FSSAI has **now framed a comprehensive group standard for 15 types of millets specifying 8 quality parameters** e., maximum limits for moisture content, uric acid content, extraneous matter, other edible grains, defects, weevilled grains, and immature and shrivelled grains, so as to ensure availability of good quality (standardized) millets in domestic and global markets.
- The **group standard is applicable to the following millets.:**
 - Amaranthus (Chaulai or Rajgira)
 - Barnyard Millet ((Samakechawal or Sanwa or Jhangora)
 - Brown top (Korale)
 - Buckwheat (Kuttu)
 - Crab finger (Sikiya)
 - Finger Millet (Ragi or Mandua)
 - Fonio (Acha)
 - Foxtail Millet (Kangni or Kakun)
 - Job's tears (Adlay)
 - Kodo Millet (Kodo)
 - Little Millet (Kutki)
 - Pearl Millet (Bajra)
 - Proso Millet (Cheena)
 - Sorghum (Jowar)
 - Teff (Lovegrass)

Millets

- It is used for the **small-grained cereals.**
- There is evidence for consumption of millets by the **Indus valley people (3,000 BC)**, and several varieties were first cultivated in India.
- Millet is grown mainly in low-income and developing countries in Asia and Africa, and are part of the food basket of about 60 crore people across the globe. **West Africa, China, and Japan** are home to indigenous varieties of the crop.
- It is the traditional food for more than half a billion people in **Asia and Africa.**
- They require much **less water** than rice and wheat, and are mainly grown in rainfed areas.
- **Example– sorghum (jowar), pearl millet (bajra), foxtail millet (kangni/ Italian millet), little millet (kutki), kodo millet, finger millet (ragi/ mandua), proso millet (cheena/ common millet), barnyard millet (sawa/ sanwa/ jhangora), and brown top millet (korale).**
- Globally, **sorghum (jowar)** is the biggest millet crop.
 - The **major producers of jowar** are the United States, China, Australia, India, Argentina, Nigeria, and Sudan.
- **Bajra** is another major millet crop.
 - India and some African countries are **major producers.**

Production of millets in India:

- In India, millets are mainly a **kharif crop.**
- During 2018-19, **three millet crops** — bajra (3.67%), jowar (2.13%), and ragi (0.48%) — accounted for about **7 per cent of the gross cropped area in the country.**
- Millets are considered to be **“powerhouses of nutrition”**
- In 2018 the Agriculture Ministry declared millets as **“Nutri Cereals”.**
 - **Jowar, bajra, ragi/ mandua, the minor millets — kangani/ kakun, cheena, kodo, sawa/ sanwa/ jhangora, and kutki — and the two pseudo millets, buckwheat (kuttu) and amaranth (chaulai) are regarded as “Nutri Cereals” for the purposes of production, consumption, and trade.**

- Millets contain 7-12% protein, 2-5% fat, 65-75% carbohydrates and 15-20% dietary fibre.
- **Small millets are more nutritious compared to fine cereals** as they have higher protein, fat and fibre content

Main millets states

- **Jowar** is mainly grown in Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Telangana, and Madhya Pradesh.
 - **Maharashtra** accounted for the largest area (1.94 mn ha) and production (1.76 million tonnes) of jowar during 2020-21.
- **Bajra** is mainly grown in Rajasthan, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Maharashtra and Karnataka.
 - **Rajasthan** accounted for the largest area (4.32 mn ha) and production (4.53 million) of bajra during 2020-21.

Consumption patterns:

- In the latest available NSSO household consumption expenditure survey– **less than 10 percent of rural and urban households** reported consumption of millets.
- More than 95% of rural households reported consumption of rice and more than 59% wheat; only 8.5%, 6.6%, and 5.3% reported consumption of jowar, bajra, and ragi respectively.
- **In urban areas, monthly per capita consumption of cereals** (9.322 kg) was **lower than in rural areas**.
- The consumption of millets was reported **mainly from Gujarat** (jowar and bajra), Karnataka (jowar and ragi), Maharashtra (jowar and bajra), Rajasthan (bajra), and Uttarakhand (ragi).

45. Caveat Petition

Section :Judiciary

Concept :

- Apex Court bench headed by CJI D Y Chandrachud reprimanded a **law student for filing a caveat** in “Shailendra Mani Tripathi v. Union of India & Others”, a petition seeking menstrual leave for female students and working women across Indian institutions
- It added that “this is a publicity-oriented caveat” and the student had “no business here.”

Caveat Petition

- In common parlance, a **caveat refers to “warning” or “caution”**.
- However, legally it connotes a “**formal notice requesting the court to refrain from taking some specified action without giving prior notice to the person lodging the caveat.**”
- The person lodging the caveat is called a “caveator”.
- The provision was **inserted by the Amendment Act of 1976 after the Law Commission’s recommendation by Section 148A of the Civil Procedure Code (CPC)**.
- However, the term is **not expressly defined anywhere except in the Calcutta High Court’s 1978 ruling**.

Who can fill the Caveat?

- **Any person has a right to lodge a caveat** in a Court.
- Any person claiming a right to appear before the Court on the hearing of such application may lodge a caveat in respect thereof.
- The caveator or the person lodging is also required to serve a notice of the caveat by “registered post” to the person on whose plea they are lodging the application

46. Lokur Committee

Section: MSc

The All-India Vanvasi Kalyan Ashram (AIVKA), an RSS affiliate that works for tribal population, in its central executive meeting held earlier this week, passed a proposal that the criteria and procedure prescribed by the law and the Lokur Committee (1965) should be followed while adding new castes to the list of Scheduled Tribes

Concept:

Lokur Committee

- The **Lokur Committee (1965)** was set up to look into criteria for defining Schedule Tribes.
- The Committee **recommended 5 criteria for identification**, namely, primitive traits, distinct culture, geographical isolation, shyness of contact with the community at large, and backwardness.

Internal task force and proposed Criteria

- A Task Force under the Chairmanship of the then Secretary (Tribal Affairs) was constituted by the Ministry of Tribal Affairs in February, 2014 to examine the existing criteria and procedure.
- The Task Force in its report submitted to the Ministry has made recommendations, among other things, for revision of criteria and procedure for scheduling of tribes as STs.
- **It includes** “socioeconomic, including educational, backwardness, the rest of the population of the State; historical geographical isolation which may or may not exist today; distinct language/dialect; presence of a core culture relating to lifecycle, marriage, songs, dance, paintings, folklore; endogamy, or in case of exogamy, marital relationship primarily with other STs.

47. The National Commission for Safai Karamcharis (NCSK)

Section: National Body

Concept:

- **Evolution:** The National Commission for Safai Karamcharis (NCSK) was constituted on 12th August, **1994 as a statutory body by an Act of Parliament ‘National Commission for Safai Karamcharis Act, 1993’**, for a period of **three years** i.e. up to 31st March, 1997. As per sub-section (4) of Section 1 of the Act, it ceased to exist after 31.3.1997. However, validity of the Act was extended up to March 2004, by subsequent amendments.
- **Nature:** After **2004**, The Commission is acting as a **non-Statutory body of the Ministry of Social Justice and Empowerment**. The Commission’s tenure is extended from time to time through Government **Resolutions**
- **Structure:** It comprises **one Chairman** (in the rank and status of the Union Minister of State) and **four members, including a lady member** (in the rank and status of the Secretary to the Government of India) and the **Secretary** (in the rank of Joint Secretary to the Govt. of India) along with other supporting staff

The mandate:

1. Recommend to the Central Government specific **programmes of action towards elimination** of inequalities in status, facilities and opportunities for Safai Karamcharis.
2. Study and evaluate the **implementation of the programmes and schemes** relating to the social and economic rehabilitation of Safai Karamcharis; and scavengers, in particular.
3. Investigate specific grievances and take **suo-motu notice** of matters relating to non-implementation of: –
 1. programmes or schemes in respect of any group of Safai Karamcharis
 2. decisions, guidelines or instructions, aimed at mitigating the hardships of Safai Karamcharis
 3. measures for the social and economic upliftment of Safai Karamcharis
 4. the provisions of any law in its application to Safai Karamcharis; and take up such matters with the concerned authorities or with the Central or State Governments
4. To study and monitor the working conditions, including those relating to health, safety and wages of Safai Karamcharis working under various kinds of employers including Government, Municipalities and Panchayats, and to make recommendations in this regard.
5. Make **reports to the Central or State Governments** on any matter concerning Safai Karamcharis, taking into account any difficulties or disabilities being encountered by Safai Karamcharis
6. Any other matter which may be referred to it by the Central Government.

However, with the enactment of “**The Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act, 2013**”, the mandate and scope of the Commission has also been enlarged. As per Section 31 (1) of the said Act, the Commission shall perform the following functions, namely:-

1. To **monitor the implementation** of the Act.
2. To **enquire into complaints** regarding contravention of the provisions of the Act, and to convey its findings to the concerned authorities with recommendations requiring further action.
3. To **advise the Central and the State Governments** for effective implementation of the provisions of the Act.
4. To take **suo motu notice** of matter relating to non-implementation of the Act.

The powers

- To call for information with respect to any matter specified above from any Government or local or other authority.
- It monitors the implementation of Supreme Court Judgement in **Safai Karamchari Andolan & ors Vs. Union of India**. “**Identify the families of all persons** who have died in sewerage work (manholes, septic tanks) since 1993 and **award compensation of Rs. 10.00 lakhs** for each such death to the family members depending on them”.

Working:

- The Chairperson and Members of the Commission undertake **extensive touring of the country to study the socio-economic and living conditions** of Safai Karamcharis and their dependents. The grievances of the Safai Karamcharis are then taken up by the Commission with the concerned local civil and police authorities
- The Commission also receives complaints/petitions from Safai Karamcharis from all over the Country. The Commission calls for the factual reports in connection with these complaints/petitions from the concerned authorities and impress upon them to redress the grievances of the affected Safai Karamcharis.
- Based on the information received through print or electronic media, the Commission **suo motu takes cognizance of problems** of Safai Karamcharis and try to resolve them by playing a pro active role.
- Whenever a matter is to be investigated or inquired into or progress of any scheme, programme etc. has to be **evaluated or non-implementation** of any decision, guidelines, instructions, measures or provisions of any law in relation to Safai Karamcharis etc. has to be looked into, the Commission **holds sittings**, as often as may be necessary, in any part of the country, for the purpose
- The Commission also **reviews various problems** of Safai Karamcharis, status of payment of compensation to the legal heirs of sewer death victims, through number of meeting/VCs with State/Local authorities.
- Based on its findings, the **Commission gives its recommendations for rehabilitation and liberation** of Safai Karamcharis from the scourge of manual scavenging to the **Ministry of Social Justice and Empowerment** from time to time as well as in its **Annual Reports**.

48. SC raps govt. on plea on ED chief 's term

Section: National Body

Context:

- Directors of the Central Bureau of Investigation (CBI) and the Enforcement Directorate (ED) may now continue in their jobs for up to five years if the government desires.
- Both posts currently have a fixed tenure of two years.
- The Delhi Special Police Establishment (DSPE) Act and The Central Vigilance Commission (CVC) Act have been amended to give the government the power to keep the two chiefs in their posts for one year after they have completed their two-year terms.
 - The CBI is governed by The DSPE Act;
 - The CVC Act lays down the term of office of the Director of Enforcement.
- And this one-year extension, the amendment says, can continue to be given until the officers complete five years as the chiefs of the agencies.
- Section 4B(1) of the Act deals with the fixed two-year tenure of the CBI Director.
 - The ordinance issued on Sunday said the following provisos shall be inserted in section 4B(1) of the DSPE Act, 1946:
 - “Provided that the period for which the Director holds the office on his initial appointment may, in public interest, on the recommendation of the Committee under sub-section (1) of section 4A (the committee led by the Prime Minister and leader of Opposition and CJI as members) and for the reasons to be recorded in writing, be extended up to one year at a time... Provided further that no such extension shall be granted after the completion of a period of five years in total including the period mentioned in the initial appointment.”
- In the case of The CVC Act, the government has inserted an amendment in clause D of Section 25 of the law that deals with the fixed two-year tenure.
 - “Provided that the period for which the Director of Enforcement holds the office on his initial appointment may, in public interest, on the recommendation of the Committee under clause (a) — comprises of CVC chief, Revenue and Home Secretaries among others — and for the reasons to be recorded in writing, be extended up to one year at a time... Provided further that no such extension shall be granted after the completion of a period of five years in total including the period mentioned in the initial appointment.”

49. National Science and Technology Management Information System

Section: National body

- Department of Science and Technology (DST) was setup in 1971, and by virtue of its responsibility in S&T policies, implementation and funding involving multi-agencies/ministries, the department has been acting as the nodal agency to establish S&T statistical system and collect national science statistics at regular intervals in the country.
- National Science and Technology Management Information System Division (NSTMIS) formerly known as Science and Technology Statistics (STS), a division of DST has been entrusted with the responsibility of carrying out the studies relating to resources devoted to S&T activities at regular intervals. The Division published the first report Research and Development Statistics in the year 1973-74.

National S&T Survey

- The National Science and Technology Management Information System (NSTMIS), Department of Science and Technology (DST), Government of India, has been conducting periodically national surveys to collect data on resources

devoted to S&T activities (mainly R&D) in the country. Based on survey data, a number of S&T reports are published, providing vital information on national R&D indicators which serves as an evidence-base for S&T assessment and policy formulation.

- The national S&T survey 2021-22 aims at capturing the current R&D landscape by collecting information from around 6000 R&D organizations viz., public sector, private sector, MNCs, higher education, SIROs and NGOs spread across the country. A structured questionnaire based on international standardization of S&T resources has been designed seeking information on various aspects such as General Information, Expenditure on S&T (R&D) activities, R&D Manpower and R&D Output.
- In the digital era, the present national survey is being conducted on a web based platform to minimize the time lag and to ensure smooth accomplishment of such a mammoth task. In order to ensure the authenticity of information, each respondent organization has been assigned a unique Username and Password.

Science and technology

1. Vibration failure led to failure of SSLV – D1

Section: Space

Concept :

- The Indian Space Research Organisation (ISRO) on Wednesday issued an official statement explaining in detail the failure of the **first development flight of the Small Satellite Launch Vehicle (SSLV)** in August last year.
- The space agency also spelt out corrective actions ahead of the launcher's next development flight – SSLV-D2 – scheduled during the first quarter of 2023.
- The **objective of SSLV-D1/EOS-02 was to inject ISRO's EOS-02 satellite and a student satellite, Azaadisat, into a circular orbit of 356.2 km.**
- However, the **spacecraft was injected into a highly elliptical unstable orbit** due to a **shortfall in velocity**, leading to their decay and deorbiting immediately, in spite of normal performance of all solid propulsion stages

Small Satellite Launch Vehicle

- Small Satellite Launch Vehicle (SSLV) is a **three stage Launch Vehicle** configured with **three Solid Propulsion Stages** and a **liquid propulsion-based Velocity Trimming Module (VTM)** as a terminal stage.
- SSLV is **2m in diameter and 34m in length** with a lift-off weight of **around 120 tonnes**.
- SSLV is capable of **launching 500kg satellites in 500km planar orbit** from Satish Dhawan Space Centre (SDSC).
- **Key Features:**
 - Low cost,
 - Low turn-around time,
 - Flexibility in accommodating multiple satellites,
 - Launch demand feasibility,
 - Minimal launch infrastructure requirements, etc.

SSLV-D1/EOS-02 Mission

- It was aimed at garnering a larger pie in the small launch vehicles market, as it could place the satellites into Low Earth Orbit.
- It was carrying the two satellites on board the rocket –
- The **primary EOS-2 Earth-observing satellite– EOS-02** is an **earth observation satellite** designed and realised by ISRO.
- This microsat series satellite offers advanced optical remote sensing operating in infra-red band with high spatial resolution.
- The **secondary AzaadiSAT student satellite–** It is an **8U Cubesat** weighing around 8 kg.
- It carries **75 different payloads** each weighing **around 50 grams** and **conducts femto-experiments**.
- It carried out tiny experiments which would have measured the ionising radiation in its orbit and also a transponder which worked in the ham radio frequency to enable amateur operators to access it.
- Girl students from rural regions across the country were provided guidance to build these payloads.
- The payloads are integrated by the student team of “Space Kidz India”.

Difference between Circular and Elliptical Orbits

- **Elliptical Orbits:**
 - Mostly objects such as satellites and spacecrafts **are put in elliptical orbits only temporarily**.
 - They are then either **pushed up to circular orbits at a greater height or the acceleration is increased until the trajectory changes from an ellipse to a hyperbola** and the spacecraft escapes the gravity of the Earth in order to move further into space — for example, to the Moon or Mars or further away.
- **Circular Orbits:**
 - Satellites that **orbit the Earth** are **mostly placed in circular orbits**.
 - **One reason** is that if the satellite is used for imaging the Earth, it is **easier if it has a fixed distance from the Earth**.

- If the distance keeps changing as in an elliptical orbit, keeping the cameras focused can become complicated.

2. Aero India 2023: LCA Tejas will be the star attraction at the India Pavilion

Section : Defence

Concept :

- A **fullscale LCA Tejas aircraft** in Final Operational Clearance (FOC) configuration will be at the centre stage of **India Pavilion at Aero India 2023**, which is being held at the Air Force Station Yelahanka in Bengaluru between February 13 and 17.

About LCA Tejas

- The **Light Combat Aircraft (LCA) programme** was started by the Government of **India in 1984** when they established the **Aeronautical Development Agency (ADA)** to manage the LCA programme.
- It replaced the ageing Mig 21 fighter planes.
- It is designed by **Aeronautical Development Agency** under the Department of Defence Research and Development.
- It is manufactured by State-owned **Hindustan Aeronautics Limited (HAL)**.

Features:

- The **lightest, smallest and tailless multi-role supersonic fighter** aircraft in its class.
- Designed to carry a **range of air-to-air, air-to-surface, precision-guided, weapons**.
- **Air to air refuelling**
- Maximum payload **capacity of 4000 kg**.
- It can attend the **maximum speed of Mach 1.8**.
- The **range of the aircraft is 3,000km**

Variants of Tejas:

- **Tejas Trainer:** 2-seater operational conversion trainer for training air force pilots.
- **LCA Navy:** Twin- and single-seat carrier-capable for the Indian Navy.
- **LCA Tejas Navy MK2:** This is phase 2 of the LCA Navy variant.
- **LCA Tejas Mk-1A:** This is an improvement over the LCA Tejas Mk1 with a higher thrust engine.

3. Deer could be reservoir of old coronavirus variants

Section :Health

Concept :

- The alpha and gamma variants of the coronavirus continued to circulate and evolve in **white-tailed deer**, even after they stopped spreading widely among people, a new study suggests.
- For the new study, Diel and his colleagues analysed about 5,500 tissue samples collected from deer killed by hunters in New York state.
- Genetic sequencing revealed that three variants of concern — alpha, gamma and delta — were all present in deer during the 2021 season.

Link between deer and coronavirus

- Previous studies of deer have suggested humans have repeatedly introduced the coronavirus into white-tailed deer populations in the United States and Canada and that deer can spread the virus to one another.
- Scientists are **not sure how people are passing the virus to deer**, but they have speculated that it might happen when people feed deer or deer encounter human trash or waste.
- Also, the **scale of the risk that infected deer pose to humans remains unclear**.
- Scientists speculate that there is high risk of transmission when there is regular contact between the infected animal and the humans.

What can happen if the virus circulates in these animals?

- The longer the virus circulates in these animals and infects a larger number of individuals, the **more likely it is to evolve and potentially lead to the emergence of a completely new variant resistant to the current vaccines**.

White-tailed deer

- The white-tailed deer is scientifically called as *Odocoileus virginianus*. It is also called as whitetail or Virginia deer.
- The deer is a medium-sized and is **native to North America, Ecuador, Central America, Peru, South America, and Bolivia**.
- It has also been introduced to New Zealand, Cuba, Puerto Rico, Jamaica and Hispaniola as well as some countries in Europe like Finland, Czech Republic, Romania, France, Germany, and Serbia.
- IUCN Classification : **Least Concern**

4. Activists object to food safety draft issued by FSSAI for GM crops

Section : Biotechnology

Context: A notification by the food safety regulatory body of India Food Safety and Standards Authority of India (FSSAI) over genetically modified organisms (GMO) has received several objections from a pan-Indian citizen's platform

More on the News:

- The FSSAI, on November 15, 2021, released a draft notification on the food safety and standards for GMOs and sought public comments for consideration by a scientific panel.
- The Coalition for a GM-Free India is an informal network of scientists, farmers, activists, environmentalists and consumers working to keep India GM Free. The **group has opposed the nod to the GM mustard variety Dhara Mustard Hybrid (DMH-11), citing environmental concerns.**
- Coalition added **long term and multi-generational tests**, as the animals have a short life span, **also need to be part of the approval process.**
- Tests such as **skin irritation test of animals, mucous member irritation** on animals, sub-chronic oral toxicity, sub-chronic feeding studies, alkaloid tests, and chronic toxicity and carcinogenicity studies should be **added to the process.**

Draft rules for GM Foods:

- **No one can manufacture or sell any food products** or food ingredients derived from genetically modified organisms (GMOs) **without prior approval.**
- **Specify norms that labs will need to adhere to** for testing GM foods.
- The proposed regulations will apply to “Genetically Modified Organisms (GMOs) or Genetically Engineered Organisms (GEOs) or Living Modified Organism (LMOs) intended for direct use as food or for processing.”
- Genetically Modified Organisms or Genetically Engineered Organisms “**shall not be used as an ingredient**” in **infant food products.**
- **Labelling norms for food products that contain 1% or more** than one percent of GMO content.

Concerns:

- Farmers body Bhartiya Kisan Union (BKU) has raised objections to the FSSAI's proposed draft regulations that **weak regulations allow for backdoor entry of GMOs.**
- Coalition said that there was no provision for a long term, comprehensive and independent testing regime
- Besides, it does not have provisions of independent data and public scrutiny.

5. Magnetite in roadside dust reveals source of pollution

Section :Pollution

Concept :

- Geologists at Jadavpur University have found that they can get a preliminary sense of the pollution in an area by collecting roadside dust and testing it with magnetic fields.
- The technique reveals the presence of **different magnetic elements, and by tracing them back to specific sources of pollution**, the researchers could tell which sources were dominating in different places.
- Their study is in the area of **environmental magnetism**, which uses magnetism to depict the impact of climate change, pollution and environmental footprints on magnetic minerals present in environmental samples such as soil, dust and sediments.

Environmental Magnetism

- Environmental magnetism is the **study of magnetism** as it relates to the effects of **climate, sediment transport, pollution and other environmental influences on magnetic minerals.**
- It makes use of **techniques from rock magnetism and magnetic mineralogy.**
- The **magnetic properties of minerals** are used as **proxies for environmental change** in applications such as paleoclimate, paleoceanography, studies of the provenance of sediments, pollution and archeology.
- The main advantages of using magnetic measurements are that magnetic minerals are almost ubiquitous and magnetic measurements are quick and non-invasive.

Magnetite

- Magnetite is an **oxide of iron.**
- Magnetite is the most magnetic of all the naturally occurring minerals on earth. It is a natural magnet.
- It contains about 72% metallic iron in it. It is found in **Karnataka, Andhra Pradesh, Rajasthan, Tamil Nadu, Goa and Kerala.**

6. Origin of Earth's volatile chemicals linked to meteorites: Research

Section: Solar system

Context:

- Researchers at **Imperial College, London** have uncovered the likely far-flung origin of Earth's volatile chemicals, some of which form the building block of life.

Details:

- Researchers took **18 meteorites** of different origins, 11 from **inner solar system** known as **non-carbonaceous meteorites**, and **7 from outer solar systems** known as **carbonaceous meteorites**.

Research findings:

- Researchers found that half of the **Earth's inventory of volatile element zinc** came from the **asteroid originating in the outer solar system**— the part beyond the asteroid belt.
- This material is also expected to have supplied other important volatiles such as water.
- **Volatiles:** are elements or compounds that change from solid or liquid state into vapour at relatively low temperatures.
 - They include the **six most common elements** found in living organisms as well as water.
 - The addition of these materials is important for the emergence of life on earth.
- Earlier scientists have thought that most of the volatiles come from the asteroids near earth.
- **Significance of the findings:**
 - The finding is important in understanding the clues about how earth came to harbour the special conditions needed to sustain life.
 - Our solar system plays a bigger role than previously thought, without the contribution of our solar systems earth would have a much lower amount of volatiles, which would have made the earth drier and unable to sustain lifeform.

Asteroid belt:

- The asteroid belt is a **torus-shaped region** in the **Solar System**, centred on the Sun and roughly spanning the space between the orbits of the planets Jupiter and Mars.
- It contains a great many solid, irregularly shaped bodies called **asteroids or minor planets**.
- The **identified objects** are of many sizes, but much smaller than planets, and on average are about **one million kilometres** (or six hundred thousand miles) apart.
- This **asteroid belt** is also called the **main asteroid belt** or **main belt** to distinguish it from other asteroid populations in the Solar System.

7. Working with biomaterials to add to the sustainable energy mix

Section :Biotechnology

Context: Researchers are experimenting with silk cocoon, spider silk and other natural materials to harvest electricity.

More on the News:

- Tiny bio-batteries from natural materials that **can create and generate electricity at a low scale**, perhaps even at the household level, is a new area of investigation that scientists hope could be a route towards a sustainable future.
- Scientists at the Indian Institute of Technology, Kanpur and the University of Central Florida, in the U.S., are banking on **silk, a complex membrane protein**, to craft a device that can power a kitchen.
- The battery prototype developed can be charged with water vapour and is inspired by the ecology of cocoons of silkworms. When dry, **silk cocoon membrane behaves like an insulator. On absorbing moisture, it generates electrical current**, which is modulated by temperature.
- The **inherent challenges** to designing and fabricating such devices are the complexity of extraction of such proteins and their short shelf life. The scientists **bypassed** the challenge of membrane protein isolation **by using a naturally occurring robust protein membrane in silk cocoon**.
- When the silk cocoon membrane is **placed between two electrodes and exposed to water vapour**, it generates current to power LEDs. LED stops glowing when we switch off the water vapour
- It can be installed **in kitchens in remote areas, or body patches to measure physiological properties** like dehydration, salt loss, perspiration, and even anxiety.
- **Advantage:**
 - Invention is eco-friendly
 - Ensure sustainable rural connectivity
 - Use truly local materials and technology and can replace for expensive photoelectric cells.

8. Muon tomography or muography

Context: Published in the Journal of Applied Physics, the study, 'High-precision muography in archaeogeophysics: A case study on Xi'an defensive walls', has been conducted by a team of scientists from Lanzhou University, China, and China Institute of Atomic Energy.

Concept:

What are muons?

- Muons are subatomic particles raining from space. They are created when the particles in Earth's atmosphere collide with cosmic rays, clusters of high-energy particles that move through space at just below the speed of light. About 10,000 muons reach every square metre of the Earth's surface a minute.
- Muons are tiny outer space particles that can penetrate hundreds of metres of stone surfaces. These particles have helped them find small density anomalies, which are potential safety hazards, inside the wall.
- These particles resemble electrons but are 207 times as massive, they are sometimes called "fat electrons". muons are so heavy; they can travel through hundreds of metres of rock or other matter before getting absorbed or decaying into electrons and neutrinos.
- In comparison, electrons can penetrate through only a few centimetres. Muons are highly unstable and exist for just 2.2 microseconds.

What is muon tomography or muography?

- Muon tomography was first used in the 1960s, uses muons to generate three-dimensional images of such large structures.
- Muography is conceptually similar to X-ray but capable of scanning much larger and wider structures, owing to the penetration power of muons.
- As these high-energy particles are naturally produced and ubiquitous, one has to place a muon detector underneath, within or near the object of interest. The detector then tracks the number of muons going through the object from different directions, to form a three-dimensional image.

Application:

- Muography has gained increasing attention from archaeologists as a novel and innovative tool to investigate large-scale archaeological sites. This approach may be especially helpful for identifying endangered cultural relics and monuments.
- Muography has found use in **customs security, internal imaging of volcanoes and others.**
- It was Used in research of **Mount Vesuvius volcano in Italy, Fukushima nuclear reactors after the 2011 earthquake and tsunami in Japan, A muon detector, called CORMIS (Cosmic Ray Muon Imaging System), to examine the wall of Xi'an city. for hidden chambers in the Pyramid of Khafre in Giza.**

9. India Semiconductor Mission (ISM)

Section

Concept:

- India Semiconductor Mission (ISM) has been setup as an Independent Business Division within Digital India Corporation having administrative and financial autonomy to formulate and drive India's long-term strategies for developing semiconductors and display manufacturing facilities and semiconductor design ecosystem.
- ISM is serving as the nodal agency for efficient, coherent and smooth implementation of the programme for development of semiconductor and manufacturing ecosystem in India.

Objectives of ISM are as under:

- Formulate a comprehensive long-term strategy for developing sustainable semiconductors and display manufacturing facilities and semiconductor design eco-system in the country in consultation with the Government ministries / departments / agencies, industry, and academia.
- Facilitate the adoption of secure microelectronics and developing trusted semiconductor supply chain, including raw materials, specialty chemicals, gases, and manufacturing equipment.
- Enable a multi-fold growth of Indian semiconductor design industry by providing requisite support in the form of Electronic Design Automation (EDA) tools, foundry services and other suitable mechanisms for early-stage start-ups.
- Promote and facilitate indigenous Intellectual Property (IP) generation.
- Encourage, enable and incentivize Transfer of Technologies (ToT).
- Establish suitable mechanisms to harness economies of scale in Indian semiconductor and display industry.
- Enable cutting-edge research in semiconductors and display industry including evolutionary and revolutionary technologies through grants, global collaborations and other mechanisms in academia / research institutions, industry, and through establishing Centres of Excellence (CoEs).
- Enable collaborations and partnership programs with national and international agencies, industries and institutions for catalysing collaborative research, commercialization and skill development.

10. Sickle cell disease (SCD)

Section: Health

Context: In the union budget of FY 2023-24, it is announced to launch a mission to eliminate sickle cell anaemia by 2047.

Concept:

- Sickle cell disease (SCD) is a chronic single gene disorder causing a debilitating systemic syndrome characterized by chronic anaemia, acute painful episodes, organ infarction and chronic organ damage and by a significant reduction in life expectancy.
- It is characterized by a modification in the shape of the red blood cell from a smooth, donut-shape into a crescent or half-moon shape.
- These cells lack plasticity and can block small blood vessels, impairing blood flow. This condition leads to shortened red blood cell survival, and subsequent anaemia, often called sickle-cell anaemia.
- This leads to chronic acute pain syndromes, severe bacterial infections, and necrosis (tissue death).
- Anaemia is a medical condition in which the red blood cell count or haemoglobin is less than normal. Symptoms of anaemia include Fatigue, Shortness of breath, Hair loss etc.

Treatment: It can be managed by simple procedures including:

- High fluid intake
- Healthy diet
- Folic acid/Iron supplementation
- Pain medication
- Vaccination and antibiotics for the prevention and treatment of infections
- A number of other therapeutic measures.

Indian scenario:

- Sickle cell disease (SCD), which is the most prevalent inherited blood disorder, is widespread amongst many tribal population groups in India
- The disease in India is prevalent predominantly in Jharkhand, Maharashtra, Madhya Pradesh, Chhattisgarh, western Odisha, eastern Gujarat and in pockets of the Nilgiri Hills in north Tamil Nadu and Kerala.
- Under National Health Mission, Government of India supports the states for prevention and management of sickle cell disease. Further in terms of treatment, support is given under NHM for capsule hydroxyurea, free blood transfusion for all Sickle cell patients (men & women) as per State's proposal.
- In the union budget of FY 2023-24, it is announced to launch a mission to eliminate sickle cell anemia by 2047. The mission entails focus on awareness creation, universal screening of approximately seven crore people in the 0-40 years age group in affected tribal areas and counselling through collaborative efforts of central ministries and state governments.

11. Amorphous Ice

Section: Msc

Concept :

- Scientists have created a new type of ice called **Amorphous Ice that matches the density and structure of water.**
- The ice is called **medium-density amorphous ice.**
- The researchers shook regular ice in a small container with centimetre-wide stainless-steel balls at temperatures of $(-)$ 200 °C to produce the variant, which has never been seen before. The ice appeared as a white granular powder that stuck to the metal balls.

Amorphous Ice:

- Amorphous ice (non-crystalline or “vitreous” ice) is an **amorphous solid form of water.**
- Normally, when water freezes, it crystallizes and its molecules are arranged into the familiar hexagonal, solid structure that we call ice. Amorphous ice lacks long-range order in its molecular arrangement.
- Amorphous ice is produced **either by rapid cooling of liquid water** (so the molecules do not have enough time to form a crystal lattice), or by **compressing ordinary ice at low temperatures.**
- Although almost all water ice on Earth is the familiar crystalline ice Ih, amorphous ice dominates in the depths of interstellar medium, making this likely the most common structure for H₂O in the universe at large.
- **Types :** Just as there are many different crystalline forms of ice (currently more than seventeen are known), there are also different forms of amorphous ice, distinguished principally by their densities.

Formation

- Amorphous ice may be formed when liquid water is cooled to its glass transition temperature (about 136 K or -137 °C) in milliseconds to prevent the spontaneous nucleation of crystals.
- Pressure is another important factor in the formation of amorphous ice, and changes in pressure may cause one form to convert into another.
- Cryoprotectants can be added to water to lower its freezing point (like antifreeze) and increase viscosity, which inhibits the formation of crystals.

12. National Centre for Biological Sciences (NCBS)

Section: Biotechnology

Concept:

- From papers dating back to 1913 to a 1986 letter of support from Manmohan Singh to MS Swaminathan, a temperature-controlled space at **the National Centre for Biological Sciences (NCBS) in Bengaluru** tells the story of the evolution of scientific work in India over the course of a century.
- This centre houses 24 collections comprising more than 1,50,000 scientific objects – paper based manuscripts, negatives, photographs, books, fine art, audio recordings etc.

National Centre for Biological Sciences

- **National Centre for Biological Sciences (NCBS)** in Bangalore, Karnataka, is a research centre specialising in **biological research**.
- It is a part of the **Tata Institute of Fundamental Research (TIFR)** under the **Department of Atomic Energy** of the Government of India.
- The mandate of NCBS is basic and interdisciplinary research in the frontier areas of biology.
- The research interests of the faculty are in four broad areas ranging from the study of single molecules to systems biology.
- NCBS focuses on **fundamental research from diverse fields of biology** including Biochemistry, Biophysics, Bioinformatics, Neurobiology, Cellular Organization and Signalling, Genetics and Development, Theory and Modelling of Biological Systems, Ecology and Evolution etc.

13. Thorium is key to our net zero goals

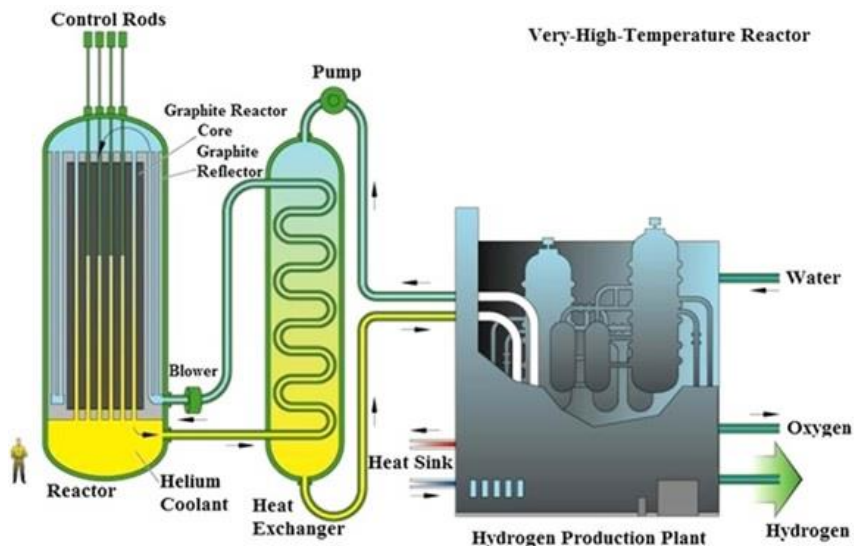
Section: Nuclear Technology

Concept:

- Apart from coal, thorium is the only abundant energy source in India. Recent developments at the Bhabha Atomic Research Centre (BARC) give hope that this mineral can be India's answer to green energy.
- BARC is working on several technologies for using thorium, of which two are noteworthy.
- One is the '**Indian high temperature reactor**' (IHTR), which is designed to produce heat and, in turn, produce hydrogen through the 'sulphuriodine' method.
- The other important thorium technology at BARC is the '**Indian molten salt breeder reactor**' (IMSB). This 5MW pilot project in Visakhapatnam is cloaked in secrecy, with BARC declining to share information about it.

High temperature nuclear reactors

- High temperature nuclear reactors (HTRs) represent a novel way to produce hydrogen at large scale with high efficiency and less carbon footprint.
- High Temperature Reactor (HTR) technology has been developed from the late 1940s in US and Germany.
- The present Very High Temperature Reactor (VHTR), operating at $>7500\text{ C}$, has over the years, evolved into a new reactor concept, designed to be a very efficient and safe system.
- It is a helium-gas cooled, graphite-moderated, thermal neutron spectrum reactor, which can provide electricity and process heat for wide-ranging applications, including hydrogen production.
- Hydrogen production through fossil fuels entails CO_2 emissions. Therefore splitting of water to produce hydrogen is a better alternative.
- There are several methods to extract hydrogen from water and two of the highly used processes are
- High Temperature Electrolysis (HTE) and
- Thermo-chemical cycles.
- Both these processes require very high temperatures, which can be provided by the VHTRs.



Indian high temperature reactor

- Indian High Temperature Reactor (HTR) technology development programme is aimed at nuclear hydrogen production by splitting water.
- Indian HTR development programme has two elements:
- a 100 kW (thermal), 1,000 degrees C portable ‘compact high-temperature reactor’ (CHTR) for technology demonstration;
- a 600 MW (thermal), 1,000 degrees C ‘Indian high-temperature reactor hydrogen’, or IHTR-H.
- These two reactors would be powered by ‘TRISO-coated particle’ fuel. TRISO — ‘tristructural isotropic’ — comprises uranium, carbon and oxygen, all of which India can make.
- The IHTR-H is designed to produce about 7,000 kg of hydrogen, 18 MWhr (thermal) of energy per hour and 9 million litres of water a day.

Indian molten salt breeder reactor (IMSBR)

- The Indian molten salt breeder reactor (IMSBR) is the platform to **burn thorium as part of 3rd stage of Indian nuclear power programme.**
- The fuel in IMSBR is in the form of a continuously circulating molten fluoride salt which flows through heat exchangers for ultimately transferring heat for power production to Super-critical CO₂ based Brayton cycle (SCBC) so as to have larger energy conversion ratio as compared to existing power conversion cycle.
- Because of the fluid fuel, online reprocessing is possible, extracting the ²³³Pa (formed in conversion chain of ²³²Th to ²³³U) and allowing it to decay to ²³³U outside the core, thus making it possible to breed even in thermal neutron spectrum.
- Hence IMSBR can operate in self-sustaining ²³³U-Th fuel cycle. Additionally, being a thermal reactor, the ²³³U requirement is lower (as compared to fast spectrum), thus allowing higher deployment potential.
- These reactors require several new technology development which are being undertaken by BARC.
- These include ⁷Li enrichment, salt preparation and purification, salt characterisation and chemistry, structural material development and characterisation, nuclear grade graphite development and characterisation, component development, SCBC and reprocessing for IMSBR.
- In addition, a dedicated facility, Molten Salt Breeder Reactor Developmental Facility (MSBRDF) is being designed for full scale demonstration of all major systems for the 5 MWth IMSBR.
- BARC has also developed Ni-Mo-Cr-Ti alloy for the vessel. R&D is being undertaken for fuel salt optimisation, characterisation, salt preparation, thermal hydraulic and corrosion studies of IMSBRs.

14. Bedaquiline

Section: Health

Concept :

- Drug resistant tuberculosis (DRTB) has posed a significant public health challenge for decades.
- After 50 years, a new drug to treat TB — bedaquiline — was approved. It had been developed with significant public funding, including from the United States National Institute of Allergy and Infectious Diseases.
- Bedaquiline is now core to WHO recommended treatment regimens, thanks to the collective work of the TB community and treatment providers. Despite the joint effort, it is Johnson & Johnson (J&J) that holds a monopoly on the drug in many countries.
- A formulation patent would not prevent generic manufacturers from **developing the active pharmaceutical ingredient in their own formulations after July 2023.**

Bedaquiline

- Bedaquiline is a medication used to treat active tuberculosis.
- Specifically, it is used to treat multi-drug-resistant tuberculosis (MDR-TB) along with other medications for tuberculosis.
- It is a oral drug.

Tuberculosis

- It is an **infectious disease caused by bacteria** (*Mycobacterium tuberculosis*) that most often affect the lungs. TB is spread from person to person through the air.
- About one-third of the world's population has latent TB, which means people have been infected by TB bacteria but are not (yet) ill with disease and cannot transmit the disease.

Drug-resistant forms of TB

- Misuse or inappropriate use, as well as poor quality of antibiotics have resulted into drug-resistant forms of TB. These drug-resistant forms range from **multi-drug resistant TB (MDR-TB) up to extensively drug-resistant TB (XDR-TB)**:
- **Multi-drug resistant TB**: It is resistant to at least Isoniazid and Rifampicin, two of the most effective TB drugs. It can only be treated with expensive, newer antibiotics over a longer period.
- **Extensively drug-resistant TB**: It is resistant to almost all forms of medical treatment with little hope of survival for the victims.

Is Tuberculosis Curable?

- Tuberculosis is curable and preventable but it is a complex disease. On the one hand, it can affect different areas of the human body, such as the lungs, the lymph nodes, the skeletal system or the brain.
- On the other hand, different types of TB exist, which can either be completely curable, but in the case of drug-resistant forms could also mean certain death.

TB Burden in India

- As per the Global TB Report 2017, India accounts for about a quarter of the world's TB cases (approx. 28, 00,000 occurred and 4.5 lakh people died due to TB) and also shares the highest burden of both TB and MDR TB.
- There are an estimated 79,000 multi-drug resistant TB patients among the notified cases of pulmonary TB each year.
- India is also the country with the second highest number (after South Africa) of estimated HIV associated TB cases.
- India also has **more than a million “missing” cases every year** that are not notified and most remain either undiagnosed or unaccountably and inadequately diagnosed and treated in the private sector.

The National Strategic Plan (2017-2025):

- It is crafted in line with other health sector strategies and global efforts, such as the draft National Health Policy 2015, WHO's End TB Strategy and the Sustainable Development Goals.
- It is aiming to **achieve elimination of TB, by 2025**. During plan period, targets for TB are:
- 80% reduction in TB incidence (i.e. reduction from 211 per lakh to 43 per lakh)
- 90% reduction in TB mortality (i.e. reduction from 32 per lakh to 3 per lakh)
- 0% patient having catastrophic expenditure due to TB
- TB elimination have been integrated into the four strategic pillars of “**Detect – Treat – Prevent – Build**” (DTPB).
- It has also linked Bank Account, AADHAR and NIKSHAY for direct cash benefits to patients.

15. ChatGPT developed by Open AI has gained wider popularity

Section: Computer

Concept :

- Artificial Intelligence (AI) research company OpenAI on recently announced **ChatGPT, a prototype dialogue-based AI chatbot** capable of understanding natural language and responding in natural language.
- So far, Open AI has only opened up the bot for evaluation and beta testing but API access is expected to follow.
- With **Application Programme Interface(API) access, developers will be able to implement ChatGPT into their own software**.
- But even under its beta testing phase, ChatGPT's abilities are already quite remarkable.
- Aside from amusing responses like the pumpkin one above, people are already finding real-world applications and use cases for the bot.

ChatGPT

- ChatGPT is a chatbot built on a large-scale **transformer-based language model** that is trained on a diverse dataset of text and is **capable of generating human-like responses to prompts**.
- **A human like language model**: It is based on GPT-3.5, a language model that uses deep learning to produce human-like text.

- **It is more engaging with details:** However, while the older GPT-3 model only took text prompts and tried to continue on that with its own generated text, ChatGPT is more engaging. It's much better at generating detailed text and can even come up with poems.
- **Keeps the memory of the conversations:** Another unique characteristic is memory. The bot can remember earlier comments in a conversation and recount them to the user.
- **Human-like resemblance:** A conversation with ChatGPT is like talking to a computer, a smart one, which appears to have some semblance of human-like intelligence.

How does ChatGPT work?

- ChatGPT is trained with AI and machine learning to provide information and responses through a conversational interface instead of already system-generated or “computerized” responses.
- It is trained on a huge sample of text taken from the internet. The dialogue format makes it possible for ChatGPT to answer follow-up questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests.
- It can even recall previous comments in a conversation and relay them to the user.

How can it be useful?

- ChatGPT can be used in real-world applications like generating content for websites, answering customer inquiries, providing recommendations as well as creating automated chatbots. It can even discover new knowledge for the user and can play the role of a virtual assistant.

What are ChatGPT's limitations?

- Open AI claims ChatGPT will occasionally produce inaccurate information and that its knowledge is restricted to global events that occurred before 2021. AI technology can also perpetuate societal biases like those around race, gender, and culture.

16. IIT-M to set up National Centre for lab-grown diamonds

Section: Msc

Concept :

- Finance Minister Nirmala Sitharaman announced in the budget 2023-24, the government's proposal to **focus on lab-grown diamonds by reducing the Customs duty on the seeds used in lab-grown diamond manufacturing.**
- FM also announced a grant to IITs to facilitate the growth of Lab-Grown Diamonds in India.
- This will encourage the indigenous production of LGD seeds, machines and to reduce import dependency.

Lab-Grown Diamonds

- Lab-grown diamonds (LGD) are **diamonds that are produced in laboratories**, using specific **technology which mimics the geological processes that grow natural diamonds.**

Production Process of LGDs:

- LGDs are mostly manufactured through two processes – high **pressure, high temperature (HPHT) method** or **Chemical Vapour Deposition (CVD) method.**
- **High pressure, high temperature (HPHT) method:** HPHT method requires extremely heavy presses that can produce up to 730,000 psi of pressure under extremely high temperatures (at least 1500 celsius).
- Usually graphite is used as the “diamond seed” and when subjected to these extreme conditions, the relatively inexpensive form of carbon turns into one of the most expensive carbon forms.
- **Chemical Vapor Deposition (CVD)method:** A thin slice of diamond seed is placed in a sealed chamber and heated to around 800 degrees celsius, and then the chamber is filled with other carbon rich gases such as methane.
- The gases are ionised into plasma using microwaves, lasers, and other techniques. The ionisation breaks down the gases and allows the carbon to merge with the diamond seed, growing the diamond up layer by layer.
- Both HPHT and CVD methods of growing diamonds artificially begin with a seed — a slice of another diamond.

Applications:

- LGDs have basic **properties similar to natural diamonds**, including their optical dispersion, which provide them the signature diamond sheen. However, since they are created in controlled environments, many of their properties can be enhanced for various purposes.
- LGDs are most often **used for industrial purposes, in machines and tools.** Their hardness and extra strength make them ideal for use as cutters.
- Pure synthetic diamonds have high thermal conductivity, but negligible electrical conductivity. This combination is invaluable for electronics where such diamonds can be used as a heat spreader for high-power laser diodes, laser arrays and high-power transistors

17. Avian Flu

Section :Health

Concept :

- The ongoing avian flu outbreak is considered the largest observed in Europe to date, according to the European Food Safety Authority, an EU agency. Between October 2021 and September 2022, 50 million farm birds had to be culled in 37 countries
- Tests revealed that the highly pathogenic avian flu virus H5N1 was the culprit.
- To stop the spread of the dangerous pathogen, more than 50,000 mink on the farm were killed.

Avian Influenza

- A disease caused by **avian influenza (AI) Type A viruses** found naturally in wild birds worldwide.
- AI viruses are broadly **classified as low pathogenic AI (LPAI) and highly pathogenic AI (HPAI)** viruses, based on their pathogenicity.
- The two virus types identified so far in the **outbreaks H5N1 and H5N8 come under the category of Highly Pathogenic Avian Influenza (HPAI)**, which is of major concern to those keeping birds, because it leads to disease and death of fowl and causes economic havoc. **H5N1 is a known threat to humans as well.**
- The virus can infect domestic poultry including chickens, ducks, turkeys and there have been reports of H5N1 infection among pigs, cats, and even tigers in Thailand zoos.
- There is **no vaccine against H5N1**.
- **Most avian influenza viruses do not infect humans**, however some, such as A(H5N1) and A(H7N9), cross the species barrier and cause disease or subclinical infections in humans and other mammals as well.
- The Avian (H5N1) virus subtype, a highly pathogenic virus, first infected humans in 1997 during a poultry epidemic outbreak in Hong Kong SAR, China.

Types of Influenza Virus

- There are four types of influenza viruses: **influenza A, B, C, and D.**
- Influenza A and B are the two types of influenza that cause epidemic seasonal infections nearly every year.
- **Avian influenza belongs to Type A viruses**
- Type A viruses are classified based on two proteins on their surfaces – Hemagglutinin (HA) and Neuraminidase (NA).
- There are about 18 HA subtypes and 11 NA subtypes.
- Several combinations of these two proteins are possible e.g., H5N1, H7N2, H9N6, H17N10, H18N11 etc.
- **Influenza C mainly occurs in humans**, but has been known to also occur in dogs and pigs.
- **Influenza D is found mainly in cattle.** It's not known to infect or cause illness in humans yet.

How Does it Spread to Humans?

- Several subtypes and strains of avian influenza viruses are now found around the world, some of them capable of causing death among humans and others inflicting serious losses on poultry farmers.
- Though **Human to Human transmission** — which takes place mostly after intimate and constant physical contact — **is rare**, the infection is virulent and, in an estimated 60% of cases, fatal.
- There **are no known instances of the flu spreading through ingestion of the bird**, even though people do contract it while plucking or culling an infected bird without proper protection, or if they are in a water body that has the droppings of an infected bird.
- In humans, the symptoms of bird infection are the same as that of any other seasonal flu — fever, body ache, sore throat, runny nose, headache, fatigue, etc., however, it can turn serious very quickly, and lead to respiratory distress.

Why is the mink farm outbreak is concerning?

- While there have been some cases of H5N1 infecting humans, the World Health Organization has said there's no evidence of human-to-human transmission so far.
- When the disease has spread to humans and other mammals, it has been via direct contact with excrement from infected birds or their carcasses.
- But the **mink outbreak appears to be a rare case where mammals are transmitting the disease to each other** rather than through direct contact with an infected bird.

18. Bard, Google's answer to 'ChatGPT'

Section: Computers

Concept :

- Google has finally decided to answer the challenge and threat posed by Microsoft-backed OpenAI and its AI chatbot,
- The search giant confirmed it will soon start public testing for a new AI chatbot of its **own called Bard**, based on the company's **Language Model for Dialogue Application (LaMDA)**.

ChatGPT (Chat Generative Pre-trained Transformer)

- Technically, ChatGPT can be categorised as a **type of generative AI** — a broad label that's used to describe any type of artificial intelligence (AI) that can be used to create new text, images, video, audio, code or synthetic data.

- Thus, ChatGPT is a complex machine learning model developed by OpenAI (a research firm founded by Elon Musk), that is able to carry out natural language generation (NLG) tasks with a very high level of accuracy.
- It is built on a **large language model** (LLM – a type of deep neural network that uses billions of parameters and is trained with petabytes of data) called **GPT-3 (Generative Pre-trained Transformer 3)**.
- **Tasks ChatGPT excels at** include – providing answers to questions, completing a given text or a phrase, writing fiction and non-fiction content from prompts, producing humanlike chatbot responses, translating text from one language to another, etc.

What is Bard?

- Bard is Google's own **conversational AI chatbot and is based on LaMDA**. It draws on information from the web to provide fresh, high-quality responses.
- In short, it will give in-depth, conversational and essay-style answers just like ChatGPT does right now.
- A user will be able to ask Bard to explain new discoveries from NASA's James Webb Space Telescope to a 9-year-old, or learn more about the best strikers in football right now, and then get drills to build your skills.

Is Bard Better than ChatGPT?

- Bard is built on **Transformer technology** – which is also the backbone of ChatGPT and other AI bots.
- Transformer technology, pioneered by Google and made open-source in 2017, is a **neural network architecture, which is capable of making predictions based on inputs**.
- Currently, Bard looks like a limited rollout and it is hard to say whether it can answer more questions than ChatGPT.
- Google has also not made clear the amount of knowledge that Bard possesses. For instance, with ChatGPT, we know its knowledge is limited to events till 2021.

Why has Google Announced Bard Right Now?

- It comes as Microsoft has invested \$10 billion this year in OpenAI and is preparing to -announce an integration of ChatGPT into its Bing Search engine.
- Offer ChatGPT to its enterprise customers as part of the Azure Cloud services.
- Google might have invented the 'Transformer' technology, but it is now being seen as a latecomer to the AI revolution.
- For Google, whose core business is search, this has resulted in a 'code red' at the company, calling in founders to review plans around AI.

Limitations of such AI Chatbots

- They sometimes write plausible-sounding but incorrect or nonsensical answers.
- The models are often excessively verbose and overuse certain phrases.
- While efforts have been made to make these models refuse inappropriate requests, it will sometimes respond to harmful instructions or exhibit biased behaviour.
- Running these models requires significant computing power (ChatGPT is powered by Microsoft's Azure Cloud services).
- This explains why the service often runs into errors at times, because too many people are accessing it.

19. CAR T Cell therapy

Section: Biotechnology

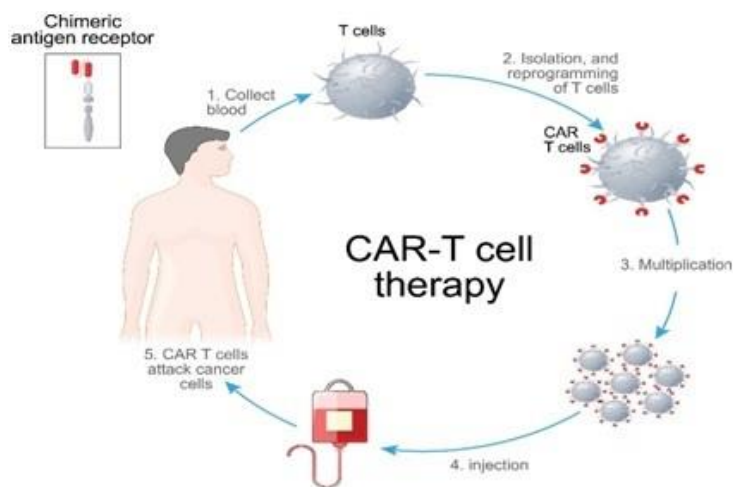
Concept:

- The three major forms of treatment for any cancer are **surgery (removing the cancer)**, **radiotherapy (delivering ionizing radiation to the tumour)**, and **systemic therapy (administering medicines that act on the tumour)**.
- Surgery and radiotherapy have been refined significantly over time whereas advances in systemic therapy have been unparalleled.
- A new development on this front, currently holding the attention of many researchers worldwide, is the **CAR T Cell therapy**.
- Systemic therapy's earliest form was chemotherapy; when administered, it preferentially acts on cancer cells because of the latter's rapid, unregulated growth and poor healing mechanisms. Chemotherapeutic drugs have modest response rates and significant side effects as they affect numerous cell types in the body. The next stage in its evolution was targeted agents, also known as immunotherapy. Here the drugs bind to specific targets on the cancer or on the immune cells that help the tumour grow or spread. This method often has fewer side effects as the impact on nontumour cells is limited. However, it is effective only against tumours that express these targets.
- Unlike chemotherapy or immunotherapy, which require mass-produced injectable or oral medication, CAR Tcell therapies use a patient's own cells. They are modified in the laboratory to activate Tcells, a component of immune cells, to attack tumours. These modified cells are then infused back into the patient's bloodstream after conditioning them to multiply more effectively. The cells are even more specific than targeted agents and directly activate the patient's immune system against cancer, making the treatment more clinically effective. This is why they're called 'living drugs'

What is CAR T Cell Therapy?

Chimeric antigen receptor T cells are T cells that have been genetically engineered to produce an artificial T-cell receptor for use in immunotherapy. Chimeric antigen receptors are receptor proteins that have been engineered to give T cells the new ability to target a specific protein.

- An 11-year-old has become the first patient to receive CAR-T therapy (immunotherapy) that uses the body's own cells to fight cancer.
- CAR-T is a **personalized form of cancer treatment**.



- CAR-T involves removing immune cells and modifying them in a laboratory so they can recognize cancer cells.
- Immunotherapy is treatment that **uses your body's own immune system to help fight cancer**.
- First, the patient has blood removed and the white blood cells are separated out, with the rest of the blood being returned to the patient.
- A harmless virus is used to insert genes into T-cells, a special type of immune cell.
- These genes cause the T-cells to add a hook on to their surface, known as a chimeric antigen receptor (CAR).
- These engineered CAR-T cells – programmed to recognize and destroy the patient's cancer cells – are multiplied in huge numbers and then infused back into the patient.

Where is it used?

- As of today, CAR T cell therapy has been approved for leukemias (cancers arising from the cells that produce white blood cells) and lymphomas (arising from the lymphatic system).
- These cancers occur through the unregulated reproduction of a single clone of cells, that is, following the cancerous transformation of a single type of cell, it produces millions of identical copies. As a result, the target for CAR T-cells is consistent and reliable.
- CAR T cell therapy is also used among patients with cancers that have returned after an initial successful treatment or which haven't responded to previous combinations of chemotherapy or immunotherapy. Its response rate is variable. In certain kinds of leukemias and lymphomas, the efficacy is as high as 90%, whereas in other types of cancers it is significantly lower. The potential side effects are also significant, associated with cytokine release syndrome (a widespread activation of the immune system and collateral damage to the body's normal cells) and neurological symptoms (severe confusion).

Cellular therapy (CT)

It is **the transplantation of human cells to replace or repair damaged tissue and/or cells**. With new technologies, innovative products, and limitless imagination, many different types of cells may be used as part of a therapy or treatment for a variety of diseases and conditions.

20. Key trails for Gaganyaan conducted

Section: Space technology

Concept:

- The Indian Space Research Organisation (ISRO), along with the Indian Navy, has conducted an important trial for the Gaganyaan, human space flight mission.
- It carried out initial recovery trials of the Crew Module in the Navy's Water Survival Test Facility (WSTF) in Kochi.
- These trials are part of the **preparation for crew module recovery operations** for the Gaganyaan mission.

About Gaganyaan Mission

- Gaganyaan is a mission by the Indian Space Research Organization (ISRO).
- Under the Gaganyaan schedule:
 - Three flights will be sent into orbit.

- There will be two unmanned flights and one human spaceflight.
- The Gaganyaan system module, called the Orbital Module will have **three Indian astronauts, including a woman.**
- It will circle Earth **at a low-earth-orbit at an altitude of 300-400 km** from earth for **5-7 days.**
- ISRO is developing the spacecraft for the mission while the **Russian space agency ROSCOSMOS** is helping in **extending the required training to the astronauts.**
- If the mission is successful, India would become the fourth country to have sent humans to space after the US, Russia and China.
- The total cost of the mission is **expected to be close to ₹10000 crores.**

Payloads:

- **Crew module** –spacecraft carrying human beings.
- **Service module** –powered by two liquid propellant engines.
- It will be equipped with emergency escape and emergency mission abort.
- **GSLV Mk III, also called the LVM-3** (Launch Vehicle Mark-3,) the **three-stage heavy lift launch vehicle**, will be **used to launch Gaganyaan** as it has the necessary payload capability.

21. Small Satellite Launch Vehicle (SSLV-D2)

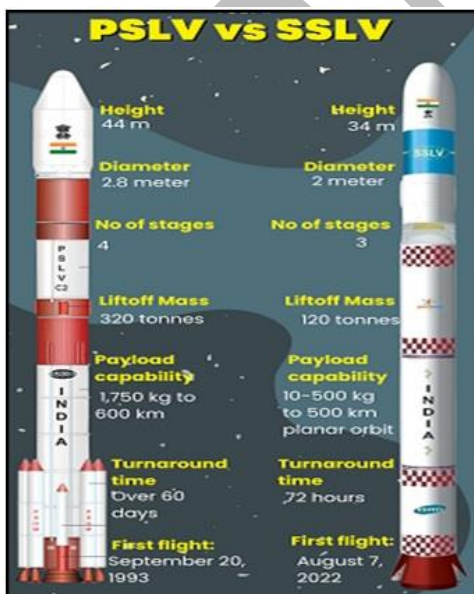
Section : Space Technology

Concept :

- The Indian Space Research Organisation (ISRO) successfully launched the second edition of the Small Satellite Launch Vehicle (SSLV-D2) from the first launch pad of Satish Dhawan space centre at Sriharikota, Andhra Pradesh.

About the Small Satellite Launch Vehicle:

- The new vehicle was developed to capture the emerging small and microsatellite commercial market.
- The SSLV (2m in diameter and 34m in length) caters to the **launch of up to 500 kg satellites to low earth orbits** on a **'launch-on-demand'** basis.
- The launch vehicle uses **three solid stages** followed by a **liquid-fuel-based Velocity Trimming Module (VTM)** to place satellites in orbit.
- **The key features of SSLV are –**
 - Low cost,
 - With low turn-around time,
 - Flexibility in accommodating multiple satellites,
 - Minimal launch infrastructure requirements (assembled by a small team in a week, compared to 6 months and 600 people for ISRO's workhorse PSLV), etc.
 - It placed the Indian Space Research Organisation (ISRO) **earth observation satellite EOS-07 and two co-passenger satellites — Janus-1 and AzaadiSat2.**
- **Note :**
 - The SSLV's first development flight (August 2022, EOS 02), **failed to place the satellites in precise orbit.**
 - **A new vehicle is declared operational by the space agency after it completes two successful development flights.**



- **EOS-07**
 - The EOS07 is a 156.3kg satellite designed, developed and realised by the ISRO.

- Its mission objective is to design and develop payload instruments compatible with micro satellite bus and technologies that are required for future operational satellites.
- It would **design and develop a microsatellite accommodating new technology payloads in a quick turnaround time**. New experiments include mm Wave humidity sounder and spectrum monitoring payload.
- **Janus-1**
 - Janus-1 is a **technology demonstrator satellite** built by **United States**-based Antaris and its Indian partners XD Links and Ananth Technologies.
 - It weighs only 10.2 kg and is a six-unit cube satellite with five payloads on board — two from Singapore, and one each from Kenya, Australia, and Indonesia.
- **AzaadiSat2**
 - The payloads have been built by **750 girl students from across India**.
 - The **payloads include**: LoRa amateur radio, a sensor to measure radiation levels in space, and sensors to measure the health of the satellite such as temperature, reset count, and inertial data.
- Asphyxia is the extreme condition caused by lack of oxygen in the blood, produced by interference with respiration or insufficient oxygen in the air.

22. Agasthyarkoodam's lost observatory

Section: Space technology

Concept:

- **Agasthyarkoodam on the Western Ghats** once (in Nineteenth-century) **housed an observatory** that was established by **Scottish meteorologist John Allan Broun**.
- Broun used it to **record magnetic and meteorological observations in tandem** with the **Thiruvananthapuram astronomical observatory**.
- Broun's astronomical research in India began after he was invited by the ruler of the erstwhile Travancore UthramTirunalMarthanda Varma to helm the Thiruvananthapuram (then Trevandrum) observatory following the death of its first director John Caldecott in 1849.
- As **terrestrial magnetism research requires simultaneous measurements from two different locations**, he established his second observatory at Agasthyar mountain at a height of 6,200 ft above sea level.
- The observatory started recording observations in July 1855. However, it was closed in 1881 by the then Madras Governor Sir William Denison.
- Notably, Broun was awarded the Keith Medal from the Royal Society of Edinburgh and the Royal Medal from the Royal Society of London.

Magnetic observatory

- Magnetic observatories continuously measure and record Earth's magnetic field at a number of locations.
- In an observatory of this sort, magnetized needles with reflecting mirrors are suspended by quartz fibres.
- Light beams reflected from the mirrors are imaged on a photographic negative mounted on a rotating drum. Variations in the field cause corresponding deflections on the negative.
- A print of the developed negative is called a
- Their magnetograms are photographed on microfilm and submitted to world data centres, where they are available for scientific or practical use.

Applications :

- Applications of magnetic observatories include the **creation of world magnetic maps** for navigation and surveying; **correction of data obtained** in air, land, and sea surveys for mineral and oil deposits; and **scientific studies of the interaction of the Sun with Earth**, etc.

23. Mammalian spread of H5N1 and its pandemic potential

Section: Health

Concept :

- **Avian influenza (bird flu)** is a **highly contagious viral infection** that impacts birds. However, rarely it can infect mammals through a phenomenon called spillover, and spread among them.
- There are **various subtypes of avian influenza viruses** that range from low pathogenic to highly pathogenic types. **One of the highly pathogenic subtypes is H5N1**.
- Apart from causing severe disease and death in birds, **H5N1 has also caused human infections through close contact with infected birds** or contaminated environments. It is often fatal.
- Several instances of the spread of H5N1 among mammals have been reported. Concerns are raised about its spillover among humans and the risks of the human pandemic.

Associated concerns of H5N1 Spread

- The H5N1 can potentially impact mammals like ferrets, minks, seals, and domestic cats when during their contact with infected birds or their feces or while consuming the infected carcasses.
- They can further serve as reservoirs. Moreover, the virus could evolve to adapt to new hosts and might lead to further outbreaks.
- Along Russia's Caspian Sea coast there was a mass mortality event that killed nearly 700 seals. Scientists are investigating the potential mammalian spillover as an H5N1 variant was detected in wild birds of the region a few months ago.
- Similarly, in February 2023, Peru registered cases of H5N1 in sea lions and a dolphin. Additionally, a lion in a zoo also died from H5N1.
- The U.K. communicated the cases of otters' and foxes' death due to H5N1 infection.
- Notably, wildlife ranging from foxes, coyotes, and raccoons scavenge on infected birds or bird carcasses.
- It was found that the **only recorded incidents of intra-mammal transmission** of the virus **were among mink in captivity at a farm in Spain** (in 2022).

H5N1 outbreaks cause severe economic impacts such as:

- Huge losses to the poultry industry
- Threatens food and vaccine security (eggs are used for vaccine production)
- Raises concerns about animal welfare

24. Scientists have discovered a third natural source of quasicrystals

Section: Msc

Concept :

- **Quasicrystal, also called quasi-periodic crystal**, is a matter formed atomically in a manner somewhere **between the amorphous solids of glasses** (special forms of metals and other minerals, as well as common glass) and the **precise pattern of crystals**.
- Like crystals, **quasicrystals contain an ordered structure**, but the **patterns are subtle** and do **not recur at precisely regular intervals**.
- Rather, quasicrystals appear to be formed from two **different structures assembled in a nonrepeating array**, the three-dimensional equivalent of a tile floor made from two shapes of tile and having an orientational order but no repetition.
- The American-Israeli scientist Dan Shechtman discovered quasicrystals in the lab in 1982.
- Quasicrystals have **poor heat conductivity, which makes them good insulators**.

Prevalence:

- Quasicrystals rank among the **most common structures in alloys of aluminum** with such metals as iron, cobalt, or nickel.
- The **first natural quasicrystal found was as microscopic grains** in a fragment of the Khatyrka meteorite lying in the **Koryak mountains of Russia**.
- The **second time** scientists found natural quasicrystals in the **remains of the Trinity test of the Manhattan Project**.
- Recently for the third time, in the **Sand Hills dunes in northern Nebraska**, scientists found silicate glass which is a **dodecagonal quasicrystal**, rare even for quasicrystals.

Applications:

- While no major commercial applications yet exploit properties of the quasicrystalline state directly, quasicrystals form in compounds **noted for their high strength and light weight**, suggesting **potential applications in aerospace and other industries**.
- Quasicrystals can be used in **surgical instruments, LED lights and non-stick frying pans**.
- **Other uses:** Selective solar absorbers for power conversion, broad-wavelength reflectors, and bone repair and prostheses applications where biocompatibility, low friction and corrosion resistance are required.

25. 4G in name only: data needles stutter in 'grey spots' in India

Concept :

- As per the Telecom Regulatory Authority of India (TRAI), from September 2022, the **three main telecom providers in India classify almost 95% of their customer base as "broadband" customers**, which now means that they should be able to access Internet speeds of minimum 2 Mbps.
- The Government in India has **revised the minimum broadband speed definition from 512 Kbps to 2 Mbps**
- Broadband speeds **below 2 Mbps are not sufficient for video calls, streaming video and many other services**.
- However, in the country, high speed broadband speeds are taken for granted in large cities whereas there are villages without any 4G network coverage.
- Besides these two categories there are smaller urban settlements and towns which are affected due to weak connectivity.
- **White spots** are those places **without cellular connectivity**.
- **Grey spots** are areas **that are connected but may not let users get enough out of their access**.

- The users in these towns, despite having 4G network towers, struggle to get usable Internet speeds mainly because of the shortage of towers i.e. these towers cannot handle high traffic due to high number of users.
- According to the data released by Ookla in December 2022, the mean wireless Internet speed in India was 108.86 Mbps, while the median was just 25.29 Mbps.
 - **Mean Speed:** indicates the internet speed an average user usually gets.
 - **Median Speed:** midpoint of the fastest and slowest connections.
- This huge difference between the mean and median shows that there is huge inequality in the quality of access.

What is Broadband?

- Broadband refers to various **high-capacity transmission technologies** that transmit data, voice, and video across long distances and at high speeds.
- Common mediums of transmission include **coaxial cables, fiber optic cables, and radio waves.**
- Broadband is **always connected and removes the need for dial-up.**
- There are six main types of broadband technologies: **digital subscriber line (DSL), cable modem, fiber, wireless, satellite, and broadband over power lines (BPL).**
- The **bulk of Internet users (92.6%) across the globe access broadband** through their mobile phones.
- Its importance is far-reaching; it allows for high-quality and quick access to information, teleconferencing, data transmission, and more in various capacities, including healthcare, education, and technological development.

26. Aero India 2023

Section :Defence

Concept :

- Prime Minister Shri Narendra Modi will inaugurate **the 14th edition of Asia's largest aero show — Aero India 2023 – in Bengaluru**, Karnataka on February 13, 2023..

Details

- Spanning over five days, the event, on the theme '**The runway to a billion opportunities**', will radiate the rise of a strong & self-reliant 'New India' by displaying India's growth in aerospace and defence capabilities.
- The focus will be on **showcasing indigenous equipment/technologies and forging partnerships with foreign companies**, in line with 'Make in India, Make for the World' vision for a secure and prosperous future.
- The major exhibitors include Airbus, Boeing, Dassault Aviation, Lockheed Martin, Israel Aerospace Industry, BrahMos Aerospace, Army Aviation, HC Robotics, SAAB, Safran, Rolls Royce, Larsen & Toubro, Bharat Forge Limited, Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL) and BEML Limited.
- The '**CEOs Round Table**', under the **chairmanship of the Raksha Mantri**, will be held on the **theme 'Sky is not the limit: opportunities beyond boundaries'**.
- The Bandhan ceremony, which witnesses signing of Memoranda of Understanding (MoUs)/Agreements, Transfer of Technologies, Product Launches and other major announcements, will be held
- The annual defence innovation event, **Manthan, will be the flagship technology showcase event**
- The '**India Pavilion**', based on '**Fixed Wing Platform**' theme, will showcase India's growth in the area, including the future prospects.

About Aero India:

- Aero India is a **biennial air show and aviation exhibition held in Bengaluru**, India at the Yelahanka Air Force Station.
- It is organised by the **Defence Exhibition Organisation, Ministry of Defence.**
- The Aero India is the largest air show in Asia.
- The Defence Ministry of India, Indian Air Force, Hindustan Aeronautics Limited Defence Research and Development Organisation (DRDO), Department of Space, the Union Civil Aviation Ministry and other such organisations join hands to organise the Aero India show making it the largest air show in Asia.
- The first **edition of the air show was held in 1996.**

27. Indo-U.S. Unmanned Aerial Vehicle to be flight-tested

Section: Defence

Concept :

- A member of the U.S. government delegation who was attending the Aero India 2023, has said that a prototype of the **Air-Launched Unmanned Aerial Vehicle (ALUAV) jointly developed by India and the US** would be flight-tested soon.
- The US government official has said that the flight testing of ALUAV is expected to commence in September-November of 2023.
- The flight testing will take place at a range in northern India and also in the US.
- **India and the US** had signed the **Project Arrangement (PA) to ALUAV in 2021** as a part of the **Defence Technology and Trade Initiative (DTTI).**

- Bengaluru-based Aeronautical Development Establishment (ADE) and the Aerospace Systems Directorate at the U.S. Air Force Research Laboratory, along with the Air Forces of India and the U.S. are the main organisations involved in the execution of the project.
- According to reports, ALUAV would be launched from the C130J aircraft.

Defence Technology and Trade Initiative (DTTI)

- In 2012, the Department of Defence created a mechanism for overcoming or reducing these impediments. This effort has **evolved into the India-U.S. Defence Technology and Trade Initiative or DTTI**.
- **Objective:** The main aim of DTTI is to bring sustained leadership focus to promote collaborative technology exchange and create opportunities for co-production and co-development of future technologies for Indian and US military forces.
- DTTI is intended to focus **senior U.S. and Indian leadership on real opportunities and challenges associated with strengthening our defence partnership**.
- While DTTI is **not a treaty or law**, it elevates the shared commitment of both countries to deepen bilateral defence cooperation
- Under the DTTI Terms of Reference, the **two leads will meet as the DTTI Group every six months alternating locations between the U.S. and India**.
- The day-to-day DTTI effort is overseen by the **DTTI Interagency Task Force (DIATF)**.
- **Four Service-led Joint Working Groups (JWGs)** execute projects and activities under DTTI:
 - Land Systems (LS),
 - Naval Systems (NS),
 - Air Systems (AS), and
 - Aircraft Carrier Technology Cooperation (ACTC).
- **Co-development of ALUAV** has been overseen by the **Joint Working Group on Air Systems and is a major accomplishment for DTTI**.

28. Bhashini and Bhasha daan initiative

Section: Computers

Concept :

- **Bhashini**, a small team at the Ministry of Electronics and IT (MeitY), is currently **building a WhatsApp-based chatbot that relies on information generated by ChatGPT** to return appropriate responses to queries.
- And because people, especially farmers in rural areas, may not always want to type out their queries, questions can be **asked on the chatbot through voice notes**.
- To **build such a language model**, the official said, it is pertinent to have large datasets of the various local languages spoken in India on which the model can be trained.
- This is where an initiative called **Bhasha Daan** comes in. It is an **ambitious project which aims to crowdsource voice datasets in multiple Indian languages**.
- On the project's website, **people can contribute in three key ways:** by recording their voice samples in multiple Indian languages by reading out a piece of text, typing out a sentence being played, and translating text in one language into another.

Bhashini – National Language Translation Mission

- **‘Digital India BHASHINI’** seeks to **enable easy access to the internet and digital services in Indian languages**, including voice-based access, and help the creation of content in Indian languages.
- It was launched by Prime Minister Narendra Modi at the inauguration of the **Digital India Week, 2022 at Gandhinagar, Gujarat**.
- Bhashini stands for **BHASaINterface for India**
- It is under the **Ministry of Electronics & IT**.
- Digital India Bhashini, as **India's Artificial Intelligence (AI)-led language translation platform**, will enable massive citizen engagement to build multilingual datasets through a crowd-sourcing initiative called Bhasha Daan.

Significance

- This mission aims to empower Indian citizens by connecting them to the Digital Initiatives of the country in their own language, thereby leading to digital inclusion.
- The Bhashini platform will catalyze the entire Digital Ecosystem and is a giant step towards realizing the goal of Digital Government.
- Bhashini aims to build a National Public Digital Platform for languages to develop services and products for citizens by leveraging the power of artificial intelligence and other emerging technologies.
- BHASHINI also aims to increase the content in Indian languages on the Internet substantially in the domains of public interest, particularly, governance and-policy, science & technology, etc., thus encouraging citizens to use the Internet in their own language.

Bhasha Daan

- Bhasha Daan is an initiative to **crowdsource language inputs** for multiple Indian languages as part of **Project BHASHINI**.
- It calls upon citizens to help build an **open repository of data to digitally enrich his/her own language**.
- The aim here is to create large datasets for Indian languages, which can be used to train AI models for use by different stakeholders to create products or services for the following:
 - Training and benchmark datasets
 - Data contributions from government entities, language chapters, communities etc
 - Crowd sourcing initiatives
 - Open source language models

Categories of Bhasha Daan

- **Suno India:** One can enrich one's language by typing the audio he/she hears, or by validating the text transcribed by others.
- **Bolo India:** One can enrich one's language by donating the voice, through recording of sentences. One can also validate the audios recorded by others
- **LikhoIndia :** One can contribute by translating the prompted text. One can also validate the translations contributed by others.
- **Dekho India:** One can enrich one's language by typing the text seen, or by labelling the image. One can also validate the images contributed by others.

29. Right to Breathe Campaign

Section: Intellectual Property

Concept :

What is Right to Breathe Campaign

- It is a **patient-driven campaign** across multiple countries, including India, for access to **cystic fibrosis (CF) therapy- Trikafta**, from the American biotech company Vertex Pharmaceuticals.
- Campaigns have been mounted in South Africa, Ukraine, Brazil and India, led by 'Vertex save us', a global community of CF patients and families, and coordinated by Just Treatment, a UK-based campaigner for patient rights, with support from other international organisations.
- Although Vertex does not have a presence in India, patient families recently wrote to the Centre, seeking access to the combination drug Trikafta or Kaftrio, that treats this life-shortening genetic disorder

What is cystic fibrosis (CF) therapy?

- CF causes sticky mucus to build up in the lungs, and digestive system, and the undiagnosed often die in their infancy, the letter said, urging the Government to consider patent provisions available in the law to make the drug accessible.

What are Fixed dose combinations (FDCs)?

- Fixed dose combinations (FDCs) are defined as a combination of two or more active ingredients within a single form of pharmaceutical administration. They have been shown to appreciably reduce the risk of medication non-adherence, which is particularly important in patients with chronic diseases. However, their rationality for use should be based on sound medical principles as there have been concerns with their irrationality and utility in several countries

30. High Altitude Balloon (HAB)

Section: Msc

Concept :

- High Altitude Balloons have been in frequent use for several decades now, though the first uses go back at least 200 years.
- They are used **mainly for scientific purposes but increasingly for tourism and joy rides, surveillance, and disaster relief and rescue.**

Working of HAB's

- Balloons typically have a basket attached to them, called gondolas, that carry instruments or human beings.
- In unmanned flights, the gondolas are also attached to a parachute. Once the job of the balloon is done, a device in the gondola is triggered to snap its ties with the balloon as well as create a rupture in the fabric of the balloon.
- With the help of the parachute, the gondola then glides down to the earth, followed by the ruptured balloon. The possible landing zone is calculated ahead of the flight based on weather conditions.

Research/Scientific Purposes

- Research balloons are balloons that are used for scientific research. They are usually unmanned, filled with a lighter-than-air gas like helium, and fly at high altitudes.
- **Meteorology, atmospheric research, astronomy, and military research** may be conducted from a research balloon.

- **Weather balloons** are a type of research balloon.
- Research balloons usually study a single aspect of science, such as air pollution, air temperature, or wind currents, although sometimes several experiments or equipment are flown together.
- Other than weather balloons, few research balloons are launched every year. This is driven by the large cost of the balloon, the instrument, which is usually custom made, and the cost of the launch.
- **Because of the altitude reached by most research balloons**, the air is too thin and too cold for humans to survive, therefore **most research balloons are unmanned and operated remotely**.
- **NASA has a full-fledged balloon programme** that does **four-five launches every year**. Several universities and research institutions also use balloons for research work.
- Balloon-based experiments have resulted in at least two Nobel prizes for Physics, in 1936 and 2006.

Surveillance Purposes

- High Altitude Balloon are used for surveillance for various reasons. Some of them are :
- **Close-range Monitoring:** In the age of satellites, surveillance balloons which are typically advanced balloons equipped with high-tech, downward-pointing imaging gear offer close-range monitoring.
- **Image Quality:** The lower-flying balloons, which hover at about the same height as commercial airlines fly, can typically take clearer images than the lowest orbiting satellites.
- Satellites that rotate in sync with Earth capture continuous but hazier images due to farther orbit.
- **Intercepting Communication:** Surveillance balloons can also be capable of “gathering electronic signals” and intercepting communications.

Ballooning in India

- Scientific balloons have been used in India for more than 70 years, the **first one having been sent in 1948 by Homi Bhabha for cosmic ray research**.
- The Mumbai-based **Tata Institute of Fundamental Research (TIFR)** started balloon fabrication work in the 1950s, and several balloon flights were launched from Mumbai and Hyderabad.
- In 1969, the TIFR opened a **full-fledged Balloon Facility in Hyderabad**, which remains India’s largest such facility today.
- It is regularly **used by the space institutions under ISRO**, and weather research institutions like the **Indian Institute of Tropical Meteorology in Pune**.

31. Army set to close around 80 deals worth ₹15000 cr

Section: Defence

Concept:

- The Army, which is currently **executing the fourth tranche of emergency procurements**, has identified nearly 80 deals, **roughly valued at ₹15,000 crore**, the Chief of the Army Staff, General Manoj Pande, said.

Emergency Procurements

- **Emergency procurements are carried out to meet critical operational requirements.**
- The Indian Army, which has made three tranches of Emergency Procurements (EP) in the last few years, is preparing for a fourth round of EP which **will be entirely from the domestic industry**.
- **Three tranches of EPs were executed, with 68 contracts worth 6000 crores**
- The Defence Ministry has previously granted the armed forces **emergency financial powers, allowing them to procure weapons systems worth up to 300 crores on a “urgent basis” without any further clearances to shorten the procurement cycle**.
- The EP also allows testing of various systems in the field before embarking on larger acquisitions through the capital budget route.

Indigenous Contracts in Army

- It was stated that indigenous contracts have nearly tripled in the last three to four years.
- Domestic industry issued Acceptance of Necessity (AoN) for various contracts totaling 40,000 crores last year.
- Similarly, the **Army signed contracts worth 47,000 crores with indigenous industry last year**.
- Over the next 7-8 years, approximately 7-8 lakh crore in potential contracts could be placed with the Indian industry. So, the industry has a lot of potential in terms of a viable market.
- The **Army’s priority areas for indigenization were outlined**, which include intelligence, surveillance, and reconnaissance (ISR), mobility solutions in forward areas, particularly the mountains, special armaments such as loitering munitions, artificial intelligence, and encrypted communication.
- The Army is also in the process of inducting new long-range rocket systems, software-defined radios that are less susceptible to jamming, and see-through armour, among other things.
- In the past, it was acknowledged that the Army’s reliance on certain weapon systems, particularly air defence, rockets, missiles, and certain tanks from Russia and Ukraine, and stated that, in terms of the immediate impact, “the supply chain

of certain spares and ammunition has been impacted to some extent, but we have adequate stocks to last for a reasonable period of time.”

- The indigenization effort in defence manufacturing is an ecosystem **with four foundational pillars: resource allocation, enabling policies, a viable market, and competition.**

32. Tackling Antimicrobial Resistance (AMR)

Section: Health

Concept:

- The COVID-19 pandemic has highlighted the urgent need for governments to prioritize health care and respond quickly to a crisis.
- The **silent pandemic of Antimicrobial Resistance (AMR)** is thriving with poor response from governments across the globe.
- **AMR threatens global public health due to the misuse and overuse of antibiotics in humans and animals.**
- India's role is critical in ensuring that AMR remains high on the global public health agenda as it is currently the G-20 president and a country vulnerable to this silent pandemic.
- Recent **UNEP report on antimicrobial resistance** report states that the **AMR crisis is disproportionately affecting countries in the Global South countries.**

Burden of AMR:

- **AMR happens when microorganisms** (such as bacteria, fungi, viruses, and parasites) **develop the ability to continue to grow, even when they are exposed to antimicrobial medicines** that are meant to kill them or limit their growth (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics).
- As a result, the medicines become ineffective and infections persist in the body, increasing the risk of spreading to others.
- **Superbugs** is a term used to **describe strains of bacteria that are resistant to the majority of antibiotics** commonly used today.
- **Microbial resistance to antibiotics has made it harder to treat infections** such as pneumonia, tuberculosis (TB), blood poisoning (septicaemia) and several food-borne diseases.
- The global epidemic of TB has been severely impacted by multidrug resistance – patients have less than a 60% chance of recovery.
- According to WHO, resistance to **ciprofloxacin** (an antibiotic commonly used to treat urinary tract infections) varied from 8.4% to 92.9% for **Escherichia coli** (E. coli) and from 4.1% to 79.4% for **Klebsiella pneumoniae** (a bacteria that can cause life-threatening infections such as pneumonia and intensive care unit- related infections).
- An **Indian Network for Surveillance of Antimicrobial Resistance (INSAR)** study indicated a high rate of resistance to commonly used drugs such as **ciprofloxacin, gentamicin, co-trimoxazole, erythromycin and clindamycin.**
- AMR also imposes a huge health cost on the patient in the form of longer hospitalisation, health complications and delayed recovery.
- It puts patients undergoing major surgeries and treatments, such as chemotherapy, at a greater risk.
- It is estimated to cause 10 million deaths per year and an overall cost of \$100 trillion to the global economy by 2050.
- AMR adds to the burden of communicable diseases and strains the health systems of a country.
- AMR in human and animal pathogens is among the top ten threats compromising global health, the WHO said in 2021.

Spread of AMR

- AMR spread is not confined to point sources.
- **Transient and diffuse sources**, which **include water** (rivers, lakes and sediments), **overflows, agricultural runoff, soil, airborne transmission and wildlife migration** (such as the movement of migratory birds) can also be important.
- Other critical factors are **globalisation, climate change and the mobility of people and goods, and wildlife.**
- AMR challenges are closely linked to the **triple planetary crisis of climate change, biodiversity loss and pollution and waste**, all of which are driven by human activity, including unsustainable consumption and production patterns.

Antimicrobials in Agri-food system

- Antimicrobials including antibiotics, antivirals and fungicides have helped treat numerous infectious diseases in people and animals and are also used to improve crop and animal production.
- However, their effectiveness is fast waning because microbes **have developed resistance to them**, and continue to do so.

Global High-Level Ministerial Conference on AMR:

- The **Third Global High-Level Ministerial Conference on Antimicrobial Resistance** (November 24-25, 2022) held in **Muscat, Oman**, saw over 30 countries adopt the **Muscat Ministerial Manifesto on AMR.**
- The Muscat Manifesto recognised the need to **accelerate political commitments in the implementation of the One Health approach** to effectively prevent, predict and detect the health crisis induced by AMR.
- It also recognised the **need to address the impact of AMR not only on humans but also on animals**, and in areas of environmental health, food security and economic growth and development.

- The **conference focused on three health targets:**
- Reduce the total amount of antimicrobials used in the agri-food system at least by 30-50% by 2030.
- Eliminate the use in animals and food production of antimicrobials that are medically important for human health.
- Ensure that by 2030 at least 60% of overall antibiotic consumption in humans is from the WHO “Access” group of antibiotics.

India against AMR:

- India’s bacterial disease burden is the highest in the world.
- A large population in India suffers from diseases like diabetes, heart ailments and cancer, making them prone to infections.
- 40% of children are malnourished and at risk of infection.
- An **Indian Council of Medical Research (ICMR) study in 2022** showed that the resistance level increases from 5% to 10% every year for broad-spectrum antimicrobials.
- The **National Action Plan on Antimicrobial Resistance (2017-21)** emphasised the effectiveness of the government’s initiatives for hand hygiene and sanitation programmes such as Swachh Bharat Abhiyan, Kayakalp and Swachh SwasthSarvatra.
- India has committed to strengthening surveillance and promoting research on newer drugs.
- It also plans to strengthen private sector engagement and the **reporting of data to the WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS)** and other standardised systems.
- The government has also attempted to increase community awareness about healthier and better food production practices, especially in the animal food industry.
- The **National Health Policy 2017** has **guidelines to limit the use of antibiotics as over-the-counter medications and restrict the use of antibiotics** for growth promotion in livestock.

One Health Approach

- The **One Health approach** requires all stakeholders to work together towards an integrated programme linking challenges of humans, terrestrial and **aquatic animal, plant health, food and feed production and the environment.**
- This approach will enable the world to effectively prevent, predict and detect the health crisis induced by AMR.

Global Antimicrobial Resistance and Use Surveillance System (GLASS):

- WHO launched the GLASS in 2015 to continue filling knowledge gaps and to inform strategies at all levels.
- GLASS has been conceived to progressively incorporate data from surveillance of AMR in humans, surveillance of the use of antimicrobial medicines, AMR in the food chain and in the environment.

National Action Plan on Antimicrobial Resistance (2017-21)

- National Action Plan on Antimicrobial Resistance (NAP-AMR) focusing on One Health approach was launched on 19th April 2017 with the aim of involving various stakeholder ministries/departments.
- **Delhi Declaration on AMR– an inter-ministerial consensus** was signed by the ministers of the concerned ministries pledging their support in AMR containment. In the line with NAP-AMR various states have launched their state action plan.

Kindly refer concept notes on AMR – <https://optimizeias.com/anti-microbial-resistance->

33. Ring around a dwarf planet

Section: Space technology

Concept:

- Astronomers have found a ring around a dwarf planet, located in the Kuiper Belt at the solar system’s edge, **called Quaoar**, according to a new study.
- The ring, however, is positioned much further away from the planet than is usual and defies theoretical explanations.

Quaoar dwarf planet

- With an estimated radius of 555 km, **Quaoar is roughly half the size of Pluto and orbits beyond Neptune.**
- It also has a moon of its own, which is known as Weywot.
- As the dwarf planet is too small and too distant to be observed directly, the researchers detected the ring with the help of a **phenomenon called stellar occultation.**

Occultation

- An occultation is an event that occurs when **one object is hidden by another object that passes between it and the observer.** The term is often used in astronomy.
- If the **closer body does not entirely conceal the farther one, the event is called a transit.**
- Both **transit and occultation** may be referred to **generally as occlusion;** and if a shadow is cast onto the observer, it is called **an eclipse.**

- The term occultation is most frequently used to describe those relatively frequent occasions when the Moon passes in front of a star during the course of its orbital motion around the Earth.

How was the ring discovered?

- A **stellar occultation occurs when, as seen from Earth, a bright star passes behind a planet.**
- This allows astronomers or anybody on Earth to observe the sharp silhouette of the planet for a brief period of time.
- The phenomenon, which rarely occurs, is used by researchers to analyze a planet's atmosphere and determine if it has a ring around it — in **1977, scientists discovered the Uranian ring system with the help of stellar occultation.**

Roche limit

- Located 2,500 miles away from the dwarf planet, the **ring is around 1,400 miles further away from the Roche limit**, as per the calculations of the scientists.
- It suggests that at such a distance, the particles of the ring should have come together to form a moon.
- **Roche limit** refers to the **distance from any celestial body within which its tidal forces prevent the formation of natural satellites.**
- **Material in orbit outside the Roche limit** would be **aggregating to become natural satellites.**
- The **rings of other planets lie within the Roche limit.**

Earth and Moon Example

- For a further understanding of the Roche limit, let's look at the Earth and the moon. The Earth's gravity pulls on the moon.
- However, one side of the moon is closer to the planet and hence, the pull is stronger on the side facing the Earth.
- The result is the so-called tidal force, which either stretches or compresses the moon from all sides.

What is the reason behind Quaoar's far-out ring?

- As of now, **nobody exactly knows how Quaoar's ring has managed to remain stable at such a distance from the Roche limit.**
- The researchers said that there can be a variety of possible explanations but they aren't sure about any one of them.
- It might be **possible that Quaoar's moon, Weywot, or some other unseen moon contributes gravity that somehow holds the ring stable.**
- **Another potential explanation** can be that the particles of the **ring are colliding with each other in such a way that they are avoiding to coalesce into a moon.**

34. AgriStack: The New Digital Push in Agriculture

Section: Agriculture

Concept:

- The government is working on a digital 'stack' of agricultural datasets, with its core as land records

About AgriStack:

- It is a **collection of technologies and digital databases** that focuses on **farmers and the agricultural sector.**
- AgriStack will **create a unified platform for farmers to provide them end to end services** across the **agriculture food value chain.**
- It is **in line with the Centre's Digital India programme**, aimed at providing a broader push to digitise data in India, from land titles to medical records.
- The government is also implementing the **National Land Records Modernisation Programme (NRLMP).**
- Under the programme, each **farmer will have a unique digital identification (farmers' ID)** that contains **personal details, information about the land they farm, as well as production and financial details.**
- Each ID will be **linked to the individual's digital national ID Aadhaar.**

Need:

- At present, the **majority of farmers across India are small and marginal farmers** with limited access to advanced technologies or formal credit that can help improve output and fetch better prices.
- Among the new proposed digital farming technologies and services under the programme include sensors to monitor cattle, drones to analyse soil and apply pesticide, may significantly improve the farm yields and boost farmers' incomes.

Potential Benefits:

- Problems such as inadequate access to credit and information, pest infestation, crop wastage, poor price discovery and yield forecasting can be sufficiently addressed by use of digital technology.
- It will also fuel innovation and breed investment towards the agricultural sector and augment research towards more resilient crops.

Issues with the move:

- Agriculture has become the latest sector getting a boost of ‘techno solutionism’ by the government.
- But it has, since then, also become the latest sector to enter the whole debate about **data privacy and surveillance**.
- The project was being **implemented in the absence of a data protection legislation**.
- Since the signing of the MoUs, several concerns related to sharing farmers’ data with private companies are raised.
- The development has raised serious concerns about **information asymmetry, data privacy and consent, profiling of farmers, mismanaged land records and corporatization of agriculture**.
- The formation of ‘Agristack’ also implies commercialization of **agriculture extension activities** as they will shift into a digital and private sphere.

35. Maintenance, Repair and Overhaul (MRO)

Section: Defence

Concept:

- HAL to provide maintenance and overhaul support for MQ9B drone engines in India.
- As India looks to purchase armed **Predator Remotely Piloted Aircraft Systems (RPAS)** from the U.S., Hindustan Aeronautics Ltd.
- (HAL) and General Atomics announced at Aero India on Wednesday that the turbo propeller engines that power the MQ9B Guardian High Altitude Long Endurance (HALE) RPAS will be supported by the HAL engine division for the Indian market.

Maintenance, Repair, and Overhaul (MRO) in Aviation Industry

- Maintenance, Repair, and Overhaul (MRO) services are essential for any industry that uses machinery to run operations.
- In the **aviation sector**, the term **MRO aviation** refers to all the **activities that are aimed at ensuring that the aircrafts remain ready to fly at all times**.
- **Maintenance** – When work is done to ensure that the aircraft is in prime condition. There are no snags or failures observed, but the aircraft is serviced to simply keep it in functional readiness.
- **Repair** – Aircraft often require repairs as they are complex machines with thousands of moving parts and software integrated. If an instrument panel doesn’t respond the way it should or there is a dent, an engine failure, or a broken window, repairs are carried out.
- **Overhaul** – With a high wear and tear rate, most aircrafts undergo overhaul after a specific duration of flight operations. As a part of the overhaul process, aircrafts are dismantled piece by piece, each part inspected and reassembled.
- The overhaul process allows detailed inspection of all surface and internal parts of the plane and is a key element of the aircraft’s lifecycle management and enhancement.

36. Viral Interference

Section : Health

Concept :

- Three years into the pandemic, COVID-19 is still going strong, causing wave after wave as case numbers soar, subside, then ascend again.
- Now in addition to covid, there is a return of flu (absent during the pandemic) plus respiratory syncytial virus (RSV), creating a “tripledeemic.”
- The surges in these old foes were particularly striking because flu and RSV all but disappeared during the first two winters of the pandemic. Even more surprising, one particular version of the flu may have gone extinct during the early Covid pandemic.
- Scholar Webby thinks that the factor that may have kept them at bay while Covid raged. It’s **called viral interference**, and it simply means that the presence of one virus can block another.

Viral interference

- Viral interference is a phenomenon for which a cell infected by a virus becomes resistant toward a second outcoming infection by a superinfectant virus.
- Multiple respiratory viruses can concurrently or sequentially infect the respiratory tract and lead to **virus–virus interactions**.
- Infection by a first virus could **enhance or reduce infection and replication of a second virus**, resulting in positive (additive or synergistic) or negative (antagonistic) interaction.
- The concept of viral interference has been demonstrated **at the cellular, host, and population levels**.
- The mechanisms involved in viral interference have been evaluated in differentiated airway epithelial cells and in animal models susceptible to the respiratory viruses of interest.
- A **likely mechanism is the interferon** response that could confer a temporary **nonspecific immunity to the host**.
- Even though other mechanisms are known, it can be assumed that **most cases of viral interference occurring in natural conditions are mediated by interferon**.

- It is a **low molecular weight protein produced by the infected cell in response to a stimulus provided by viral nucleic acid(s)**.
- The interferon produced by a cell can migrate to other cells not yet involved by the spreading infection, transmitting to them the antiviral-resistant state.

37. Schedule M norms

Section : Health

Context: In just six months, reports of three major global incidents, including deaths, have been potentially linked to pharmaceutical products sourced from India. The incidents, have put local manufacturing practices and supply chain management under fresh scrutiny

Content:

After incidents of deaths reported recently a policy directive is being discussed to “upgrade” present manufacturing practices to the World Health Organization’s cGMP (current Good Manufacturing Practices) levels. But not everyone is convinced that such “upgradation” would ensure quality products are supplied in the country and outside. Especially, since some of the companies in the dock now are reportedly WHO-GMP compliant.

The present **Schedule M norms** for manufacturing are stringent, and sometimes all that’s needed is technical hand-holding by regulators, or financial help to upgrade systems and documentation.

Schedule M norms: It is good manufacturing practice norm.

38. Feathering in Nepal Plane crash

Section: Msc

Concept :

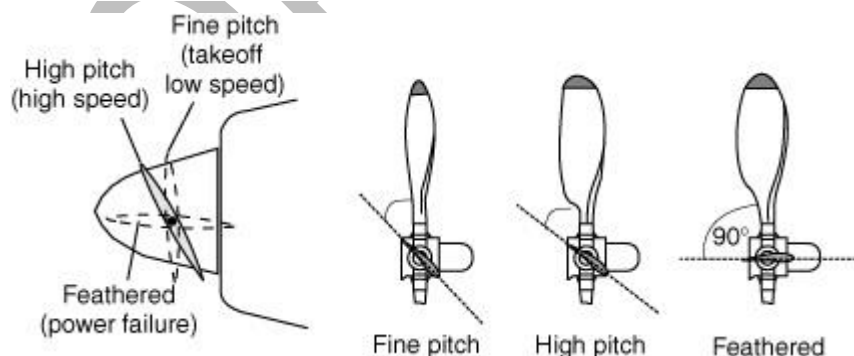
- A preliminary report by the Aircraft Accident Investigation Commission of Nepal on the crash of a Yeti Airlines ATR 72-500 brought to light that the **propellers of the plane were found in an unusual “feathered” position**.

What is ‘feathering’?

- Sometimes an aeroplane’s engine stops working while it’s flying.
- In an aeroplane with a propeller, the pilot can change the angle of the propeller blades so they cut through the air more efficiently. This is called **“feathering” the propellers**.
- Feathering helps the aeroplane glide farther and stay at a safe speed. When pilots have to make an emergency landing, they often use feathering to help them.
- If the propellers keep spinning even when the engine is off, it can be dangerous if the aeroplane is flying low, but it can **actually help restart the engine if the aeroplane is flying high**.

Types of propeller engines

- **Fixed-pitch propeller:** As the name suggests, the angle or pitch at which the propeller blades meet the airflow is fixed. The blade angle or pitch cannot be changed.
- **Variable-pitch propeller:** Both the fixed-pitch and adjustable-pitch propeller types have their limitations. Pilots wanted different propeller pitches for takeoff, climb, cruise, etc. — a small blade pitch is ideal for takeoff, medium pitch for climb and high pitch for cruise. They also wanted propellers whose pitch could be changed from the cockpit during the flight.
- **Constant-speed propeller:** This is a more advanced variable-pitch propeller, in which the blade pitch changes automatically to maintain a constant aircraft speed.



39. Need for extra dose of polio

Section: Health

Concept :

- An **additional dose of injectable polio vaccine** has been introduced in West Bengal as part of the **Universal Immunisation Programme (UIP)** for children in India.
- As per the announcement, additional dose will be given at nine months, in addition to the existing doses in the current UIP.
- **There were four oral doses and two injectable doses before the additional third dose was introduced in January 2023.**
- West Bengal is considered among high risk areas for polio.
- According to a noted virologist, an additional dose of inactivated poliovirus (IPV) at nine months is **expected to protect against any Vaccine Associated Paralytic Polio or Vaccine Derived Polioviruses.**

What is Polio?

- Polio also called as **Poliomyelitis**.
- It is a viral disease that **destroys the nerve cells present in the spinal cord, causing paralysis or muscle weakness** to some parts of the body.
- It is a **contagious disease** affecting the nervous system and is caused by **Picornaviridae – a poliovirus**.
- The virus is **transmitted by person-to-person** through the following ways –
- Through the faecal-oral route.
- By contaminated water or food.
- This virus primarily **grows and multiplies in the intestine**, from where it can attack the nervous system and will cause polio and paralysis on an advanced level.
- There are **three individual and immunologically distinct** wild poliovirus strains:
 - Wild Poliovirus type 1 (WPV1)
 - Wild Poliovirus type 2 (WPV2)
 - Wild Poliovirus type 3 (WPV3)
- Symptomatically, all three strains are identical, in that they cause irreversible paralysis or even death.
- However, there are genetic and virological differences, which make these three strains separate viruses which must each be eradicated individually.
- **WPV2 and WPV3 have been eradicated globally but WPV1 remains in circulation in Afghanistan and Pakistan.**
- WPV2 was eradicated in 1999.
- There is **no cure, but it can be prevented through immunisation.**

Vaccines:

- **Oral Polio Vaccine (OPV):** It is given orally as a birth dose for institutional deliveries, then primary three doses at 6, 10 and 14 weeks and one booster dose at 16-24 months of age.
- **Injectable Polio Vaccine (IPV):** It is introduced as an additional dose along with the 3rd dose of DPT (Diphtheria, Pertussis and Tetanus) under the Universal Immunisation Programme (UIP).

Polio Eradication:

- For a country to be declared polio-free, the **wild transmission of all three kinds of Polioviruses has to be stopped.**
- For eradication, cases of **both wild and vaccine-derived polio infection have to be reduced to zero.**
- **Eradication of a disease refers to the complete and permanent worldwide reduction to zero new cases** through deliberate efforts. If a disease has been eradicated, **no further control measures are required.**
- However, **elimination of a disease refers to reduction to zero or a very low defined target rate of new cases in a defined geographical area.** It requires **continued measures to prevent re-establishment of disease transmission.**

How did India achieve its polio-free status?

- Rotary International launched its polio eradication campaign, Polio Plus, in 1985, it was in 1986 that it provided a \$2.6 million grant to Tamil Nadu for a pilot polio vaccination campaign.
- **In 1995**, the Union government announced the first **National Polio Immunisation Day.**
- **In 2012**, the **World Health Organisation removed India from the list of endemic countries.**
 - The last case of poliovirus type 2 was recorded in India in October 1999 at Aligarh, Uttar Pradesh.
 - The last case of poliovirus type 3 was on October 22, 2010, at Pakur, Jharkhand.
 - The last case of poliovirus type 1 was recorded on January 13, 2011, at Howrah, West Bengal.
 - To prevent the virus from coming to India, the government since March 2014, has made the Oral Polio Vaccination (OPV) mandatory for those travelling between India and polio-affected countries, such as Afghanistan, Nigeria, Pakistan, Ethiopia, Kenya, Somalia, Syria and Cameroon.

40. Chandrayaan 3 lander successfully completed key test

Section: Space technology

Concept :

- According to the **Indian Space Research Organisation (ISRO)**, the **lander for the Chandrayaan-3 mission** successfully completed the **crucial EMI-EMC (Electro – Magnetic Interference/ Electro – Magnetic Compatibility) test** at the U.R. Rao Satellite Centre, Bengaluru.

Chandrayaan-3 Lander:

- The Chandrayaan-3 mission is slated to be launched later this year by the **GSLV MkIII (Launch Vehicle Mark 3 – LMV3)** from the Satish Dhawan Space Centre at Sriharikota.
- According to the space agency, the **EMI-EMC (Electro – Magnetic Interference/ Electro – Magnetic Compatibility) test** is conducted for satellite missions to **ensure the functionality of the satellite subsystems** in the space environment and their **compatibility with the expected electromagnetic levels**.
- This test is a major milestone in the realisation of the satellites, as the mission's complexity calls for establishing radio-frequency (RF) communication links between the modules.

Chandrayaan 3 Mission

- ISRO has announced Chandrayaan-3, **a soft-landing mission, after the failure of Vikram Lander under Chandrayaan 2.**
- Its **moon Lander will be the first to land in southern hemisphere of moon surface.**
- While the **Orbiter of Chandrayaan 2 is in the lunar orbit**, the **Lander and Rover failed** after the lander crash-landed on lunar surface.
- ISRO is planning to land the **Chandrayaan 3 lander at the same location** as the Chandrayaan 2 – the **lunar South Pole**, which is a singularly promising part of the moon's surface.
- Unlike its predecessor, **Chandrayaan-3 will not have an orbiter.**
- Chandrayaan-3 **interplanetary mission has three major modules: the Propulsion module, Lander module, and Rover.**
- **Propulsion module:**
- It has **Spectro-polarimetry of HABitable Planet Earth (SHAPE)** payload to study the spectral and polarimetric measurements of Earth from lunar orbit.
- **Lander payloads:**
- **Chandra's Surface Thermophysical Experiment (ChaSTE)** to measure the thermal conductivity and temperature;
- **Instrument for Lunar Seismic Activity (ILSA)** for measuring the seismicity around the landing site;
- **Langmuir Probe (LP)** to estimate the plasma density and its variations, etc.
- **Rover payloads:**
- **Alpha Particle X-ray Spectrometer (APXS)** and **Laser Induced Breakdown Spectroscopy (LIBS)** for deriving the elemental composition in the vicinity of the landing site.

41. Scientists tested an electron's response to a magnetic field with extreme accuracy

Section :Msc

Concept :

- Physicists have recently made the most precise test yet, of the **Standard Model of Particles** by measuring the magnetic moment of an electron with 0.13 parts per trillion accuracies.
- The measurement is 2.2 times more accurate than the previous best, recorded 14 years ago.

Standard Model(SM)

- The Standard Model (SM) is the theory that **describes the properties of all subatomic particles, classifies them into different groups** and determines **how they are affected by three of the four fundamental forces of nature: the strong nuclear force, the weak nuclear force and electromagnetic force (cannot explain gravity).**
- In the 1960s, physicists used SM to predict the existence of a particle called the Higgs boson; it was finally discovered in 2012.
- Similarly, SM has enabled physicists to successfully predict the existence and properties of dozens of particles and is considered one of the most successful theories in the history of physics.
- However, it **still fails to explain why the universe has more matter than antimatter, what is dark matter, or what is dark energy.**

Will humans ever find evidence of beyond-Standard Model(SM) forces?

- That's a billion-dollar question. Physicists will test as many of the SM's predictions as possible to look for a crack in its facade. They already have some clues: SM says neutrinos should be massless, but they're not.
- Physicists have also built detectors to look for different types of hypothetical dark matter particles, sifting through astronomical data to make sense of dark energy, and looking into each other's calculations.
- Collectively, the community hopes that at least one of these efforts, guided by the principles they discover in their theoretical studies, will reveal a glimpse of a world beyond the Standard Model.

42. Sickle Cell Disease (SCD)

Section : Health

What is Sickle Cell Disease (SCD)?

- **About:**
 - **SCD is a chronic single gene disorder** causing a debilitating systemic syndrome characterized by **chronic anaemia, acute painful episodes, organ infarction and chronic organ damage** and by a significant reduction in life expectancy.

Science behind it:

- Haemoglobin which is tasked with carrying oxygen to all parts of the body, has four protein subunits — two alpha and two beta.
- In some people, mutations in the gene that creates the beta subunits impact the shape of the blood cell and distorts it to look like a sickle. A round red blood cell can move easily through blood vessels because of its shape but sickle red blood cells end up slowing, and even blocking, the blood flow.
- Moreover, sickle cells die early, resulting in a shortage of red blood cells that deprive the body of oxygen. These obstructions and shortages may cause chronic anaemia, pain, fatigue, acute chest syndrome, stroke, and a host of other serious health complications.
- Without treatment, quality of life is compromised and severe cases can become fatal in the initial years of life.

Does SCA only affect some?

- Research and screening programmes have found that the prevalence of haemoglobinopathies — disorders of the blood — is more common among tribal populations than nontribal communities in India.
- Research has shown that SCA is prevalent in communities residing in areas where malaria is endemic.
- Around the middle 1940s, doctors found that those with sickle red blood cells were more likely to survive malaria. Those with the trait in some African countries were found to be potentially resistant to lethal forms of malaria and had a survival advantage. The sickle cell trait thus gave an evolutionary advantage, offering immunity to some people during malaria epidemics. In India, States and UTs with tribal populations contribute a significant malaria case load. Additionally, the documented prevalence of SCA is higher in communities that practice endogamy, as the chances of having two parents with sickle cell trait is higher.
- **Symptoms:**
- Symptoms of sickle cell disease can vary, but some common symptoms include:
 - **Chronic Anaemia:** leading to fatigue, weakness, and paleness.
 - **Painful episodes** (also known as sickle cell crisis): these can cause sudden and intense pain in the bones, chest, back, arms, and legs.
 - **Delayed growth and puberty**

Can it be treated?

- Sickle cell anaemia is a genetic disorder, making complete “elimination” a challenge that requires major scientific breakthrough.
- The only cure comes in the form of gene therapy and stem cell transplants - both costly and still in developmental stages.
- Blood transfusion, wherein red blood cells are removed from donated blood and given to a patient, is also a trusted treatment in the absence of permanent cures. But challenges include a scarcity of donors, fears around safe supply of blood, risk of infection etc.

Government efforts:

- The Indian Council of Medical Research and the National Rural Health Mission in different States are undertaking outreach programmes for better management and control of the disease.
- The Ministry of Tribal Affairs launched a portal wherein people can register themselves if they have the disease or the trait, in order to collate all information related to SCA among tribal groups.
- Government has released **technical operational guidelines for prevention and control of hemoglobinopathies in 2016** including sickle cell
- Integrated centers have also been established in **22 tribal districts for treatment and diagnosis.**
- The **State Haemoglobinopathy Mission** has been established in **Madhya Pradesh** to address the challenges in screening and management of the disease.
- In the Budget, the Union Health Minister said the government plans to distribute “special cards” across tribal areas to people below the age of 40. “The cards will be divided into different categories based on the screening results..” The mission will receive funding under the National Health Mission.

43. ICBM: North Korea makes fresh threats against drills; U.S. bombers fly after ICBM test

Section: Space technology

Concept:

- A ballistic missile follows a ballistic trajectory to deliver one or more warheads on a predetermined target.
- A ballistic trajectory is the path of an object that is launched but has no active propulsion during its actual flight (these weapons are guided only during relatively brief periods of flight).
- Consequently, the trajectory is fully determined by a given initial velocity, effects of gravity, air resistance, and motion of the earth (Coriolis Force).
- Shorter range ballistic missiles stay within the Earth's atmosphere.
- Longer-ranged intercontinental ballistic missiles (ICBMs), are launched on a sub-orbital flight trajectory and spend most of their flight out of the atmosphere.

Types of ballistic missiles based on the range

- Short-range (tactical) ballistic missile (SRBM): Range between 300 km and 1,000 km.
- Medium-range (theatre) ballistic missile (MRBM): 1,000 km to 3,500 km.
- Intermediate-range (Long-Range) ballistic missile (IRBM or LRBM): 3,500 km and 5,500 km.
- **Intercontinental ballistic missile (ICBM): 5,500 km +.**
- **Ballistic missiles of India: Agni, K-4 (SLBM), Prahaar, Dhanush, Prithvi and Trishul.**

44. Autism spectrum disorder

Section: Health

Concept:

- According to the World Health Organisation, 'Autism spectrum disorder' (ASD) affects one in 100 children.
- Autism spectrum disorder (ASD)
- Autism spectrum disorder (ASD) is a **developmental disability caused by differences in the brain.**
- The autism spectrum, often referred to as just autism, autism spectrum disorder (ASD) or sometimes **autism spectrum condition (ASC), is a neurodevelopmental disorder characterized by difficulties** in social interaction, verbal and nonverbal communication, and the presence of repetitive behavior and restricted interests.
- Other common signs include unusual responses to sensory stimuli, and an insistence on sameness or strict adherence to routine.
- **Signs of autism usually appear by age 2 or 3.** Some associated development delays can appear even earlier, and often, it can be diagnosed as early as 18 months.
- Research shows that early intervention leads to positive outcomes later in life for people with autism.
- There is **no cure for autism**. There are many forms of therapy, such as speech and occupational therapy that may help autistic people.

Link between gut microbiome and Autism

- Although the **researchers have still not established the aetiology of ASD completely**, there have been reports which say that the **gut-brain axis could have a prominent role in causing ASD.**
- The **gut microbiome** is found to have a **big impact on immune modulation and metabolic activities in humans** and **differences in gut microbiome composition** have been seen with respect to **various diseases such as Crohn's disease, celiac disease and autism.**
- Immune modulation refers to the actions undertaken by the immune system of the body to ensure its response is proportionate to a threat.

Gut Microbiome

- 'Gut Microbiome' is made up of the **trillions of microorganisms and their genetic material that live in your intestinal tract.**
- These microorganisms, mainly comprising bacteria, are involved in functions critical to your health and wellbeing.

Faecal microbial transplantation (FMT)

- Faecal microbial transplantation (FMT) is regarded as one of the most promising approaches to reverse gut dysbiosis.
- Under FMT, stool samples from healthy individuals are transplanted into the large intestines of affected children.
- A study conducted by Ohio State University in 2017 on FMT reported that the intervention improved both gastrointestinal and ASD-related symptoms.
- FMT is also a cost-effective approach with minimal risk. However, there is a need to build consensus among all stakeholders in order to adopt it.

45. ISRO announces opportunities to analyse Astrosat

Section: Space

Concept:

- The Indian Space Research Organisation (ISRO) has recently made an Announcement of Opportunity (AO) to allow scientists and researchers to analyze data from the first dedicated Indian astronomy mission, AstroSat.

About AstroSat:

- It is India's **first dedicated multi-wavelength space observatory**.
- It is the first dedicated Indian astronomy mission aimed at studying celestial sources **in X-ray, optical, and UV spectral bands simultaneously**.
- AstroSat, with a lift-off mass of 1515 kg, was launched by the Indian launch vehicle PSLV from Satish Dhawan Space Centre, Sriharikota, on September 28, 2015, into a 650 km orbit inclined at an angle of 6 degrees to the equator.
- The spacecraft control center at **Mission Operations Complex (MOX) of ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru**, manages the satellite during its entire mission life.
- It is a **multi-institute collaborative project**, involving IUCAA, ISRO, Tata Institute of Fundamental Research (Mumbai), Indian Institute of Astrophysics (Bengaluru), and Physical Research Laboratory (Ahmedabad), among others.

Scientific Objectives:

- To understand high energy processes in binary star systems containing neutron stars and black holes.
- Estimate magnetic fields of neutron stars.
- Study star birth regions and high energy processes in star systems lying beyond our galaxy.
- Detect new briefly bright X-ray sources in the sky.
- Perform a limited deep-field survey of the Universe in the Ultraviolet region.

46. Viscose Fibre

Section: Msc

Concept:

- Viscose, a man-made fibre witnessing global demand growth, is a new addition to India's textile story.
- Viscose fibre consumption is witnessing a steady rise, where the market grew from 542 KT (Thousand tons) in 2021 to 744 KT in 2022, a robust 37 per cent growth.
- One issue plaguing the viscose value chain is the limited raw material supply of **Viscose Staple Fibre (VSF)**.
- India has a limited number of players involved in manufacturing VSF, with one major company contributing to over 90 per cent of the supply.
- As a result, **many weavers rely on imported fibre**. It provides new alternatives to these weavers so that they can survive in the market and be competitive.
- An upcoming development that can be detrimental to the weavers of viscose is the anti-dumping duty imposition on VSF imports.

About Viscose Fibre:

- Viscose is a **type of rayon**. Originally **known as artificial silk**, in the late 19th century, the term "rayon" came into effect in 1924.
- The name "viscose" is derived from the way this fibre is manufactured; a viscous organic liquid used to make both rayon and cellophane.
- It is a **biodegradable fibre and an alternative to silk and cotton**.
- It is **versatile, Highly absorbent and Inexpensive fibre**.
- Viscose is made **from tree wood pulp, like beech, pine, and eucalyptus, but can also be made from bamboo**.
- As a manufactured regenerated cellulose fibre, it is **neither truly natural** (like cotton, wool or silk) **nor truly synthetic** (like nylon or polyester) – it falls somewhere in between.
- Chemically, viscose resembles cotton, but it can also take on many different qualities depending on how it is manufactured.

47. ICAR develops wheat that can beat the heat

Section :Biotechnology

Context: Last year in March, the temperature increases above normal conditions results into the damage of crops specially wheat, at a time when the grains were accumulating starch and proteins; leading to a significant drop in output as well as government procurement.

More in news:

- Keeping previous year's damage in view, the Agriculture ministry has set-up a **committee to monitor the situation arising from the increase in temperatures and its impact**, if any, on the current wheat crop.
- This year, the temperatures are already **3-5 degrees Celsius above normal** in many wheat-growing areas.

Probable solution of India's crop vulnerability due to terminal heat stress:

- Indian Council of Agricultural Research (ICAR) has suggested to advance the time of sowing.

- **Wheat** is a typically a **140-145 days crop** planted mostly in November – before the middle of the month in **Punjab, Haryana, Rajasthan and Madhya Pradesh** (post the harvesting of paddy, cotton and soyabean) and the **second half and beyond in Uttar Pradesh and Bihar** (after sugarcane and paddy).
- If sowing can be **preponed** and taken up from around October 20, the **crop isn't exposed to terminal heat**, with much of the grain-filling being completed by around the third week of March.
- It can, then, be comfortably harvested by the month-end.
- **Issue:** wheat sown before early-November is also prone to premature flowering.
 - The crop seeded in the first half of November normally takes **80-95 days to come to heading** (i.e. for the 'baali', or earheads bearing the flowers and eventually grain, to fully emerge from the wheat tillers).
 - But if we sow in October, **heading is cut short by 10-20 days** and occurs in **70-75 days**. This **affects yields**, as the crop does not get enough time for vegetative growth (of roots, stems and leaves).

New varieties developed by IARI:

- The **IARI scientists** have developed **three varieties**, all of them **incorporating genes that are responsible for the “mild vernalisation requirement”** preventing premature flowering and early heading.
 - **Mild vernalisation requirement** is the need for a certain minimum period of low winter temperatures for initiation of flowering.
- 1. **HDCSW-18:** It was released and officially notified in It has a **Higher yield** and its plants are taller than the normal varieties, which made them prone to lodging or bending over when their earheads were heavy with well-filled grains.
- 2. **HD-3410:** It was released in **2022**, has **higher yield potential** (7.5 tonnes/hectare) with **lower plant height** (100-105 cm).
- 3. **HD-3385:** Most promising among the three. With the **same yields as HD-3410**, **plant height** of just 95 cm and **strong stems**, it is **least lodging-prone** and **most amenable for early sowing**.
- IARI has registered **HD-3385** with the **Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA)**. It has also **licenced the variety to the DCM Shriram Ltd-owned Bioseed** for undertaking multi-location trials and seed multiplication.

Merits of these wheat varieties:

- Longer window for grain development
- Longer period for vegetative stage growth between germination and flowering
- Able to accumulate more biomass along with grain weight

48. Third patient is cured of HIV

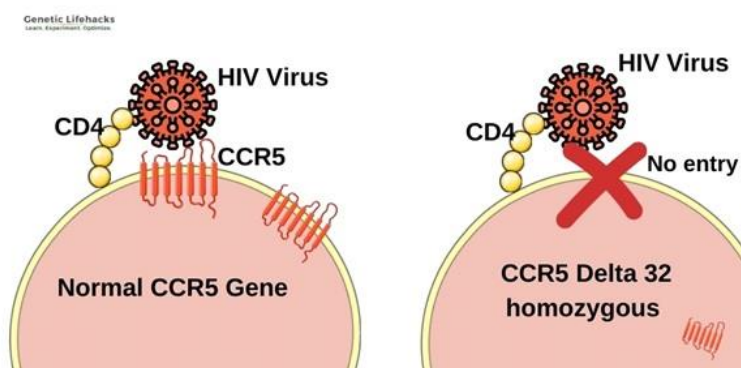
Section: Health

Concept:

- A 53-year-old man from Germany, referred to as the Dusseldorf patient, has become at least the third person to have been “cured of HIV” with the virus not being detectable in his body.
- This was achieved with a bone-marrow transplant from people carrying a specific HIV-resistant genetic mutation (CCR5-delta 32 mutation).
- The CCR5-delta 32 mutation prevents the receptors used by the HIV virus from forming on the surface, effectively denying the virus its doorway to the body. It is this genetic mutation that scientists have utilised to “cure” patients of HIV.

About CCR5 Delta 32:

- **Cysteine-cysteine chemokine receptor 5 (CCR5)** is a protein on the **surface of white blood cells** that are involved in the immune system as it acts as a receptor for chemokines.
- CCR5 is found in the **cell membranes of many types of mammalian cells**, including **nerve cells** and **white blood cells**.
- In humans, the CCR5 gene that encodes the CCR5 protein is located on the short (p) arm at position 21 on chromosome 3.
- The role of CCR5 is to **allow entry of chemokines into the cell**—chemokines are involved in signalling the body's inflammation response to injuries.



How does the mutation work in HIV patients?

- Various mutations of the CCR5 gene are known that result in damage to the expressed receptor.
- One of the **mutant forms of the gene is CCR5-delta 32**, which results from the **deletion of a particular sequence of 32 base pairs**.
- **HIV** (Human Immunodeficiency Virus) mainly **attacks the CD4 immune cells** in the human body, thereby reducing a person's ability to fight off secondary infections.
- The **CCR5 receptors on the surface of the CD4 immune cells act as a doorway for HIV**. However, the CCR5-delta 32 mutation **prevents these receptors used by the HIV from forming on the surface**, effectively removing the doorway.
- **Prevalence :**
- Only **1 per cent of the people** in the world **carry two copies of the CCR5-delta 32 mutation** (they got it from both their parents) and another **20 per cent carry one copy of the mutation**, mainly those of **European descent**.

Can such transplants solve the HIV crisis?

- With the mutation existing in very few people and nearly 38.4 million people living with HIV across the world, it would be very difficult to find a matching donor in the first place.

49. Neutrinos are their own anti-particle

Section : Space technology

Concept :

- An experiment in Japan recently reported that it failed to find “strong evidence” that the neutrinos are their own anti-particles.

Anti particles

- Every elementary particle has an anti-particle. If the two meet, they will destroy each other in a flash of energy.
- The electron's anti-particle is the positron. They can be distinguished because they have opposite charges.
- Similarly, neutrinos have anti-neutrinos. However, neither is electrically charged, nor possesses any other properties to really differentiate between them.

Experiment

- Physicists working with the Kamioka Liquid Scintillator Antineutrino Detector (KamLAND) in Japan recently reported that after analysing two years' data, **they could not find signs that neutrinos could be their own anti-particles**.
- KamLAND looks for an event called **neutrinoless double beta-decay**.
- In normal double beta-decay, two neutrons in an atom turn into two protons by emitting two electrons and two anti-neutrinos.
- In neutrinoless double beta-decay, the anti-neutrinos aren't emitted, which can happen only if anti-neutrinos are just different kinds of neutrinos.
- This may rule out a few theories trying to explain neutrinos' many mysterious properties.

What are neutrinos?

- Neutrinos are the **second most abundant particles in the world, after photons**, or the light particle.
- Neutrinos are mysterious particles, produced copiously in nuclear reactions in the Sun, stars, and elsewhere.
- They also “oscillate”– meaning that different types of neutrinos change into one another.
- Probing of oscillations of neutrinos and their relations with mass are crucial in studying the origin of the universe.
- Neutrinos are **created by various radioactive decays**; during a supernova, by cosmic rays striking atoms etc.

Features of neutrinos:

- Neutrinos interact very weakly with everything else – trillions of them pass through every human being every second without anyone noticing.
- A neutrino's spin always points in the opposite direction of its motion.
- It is now generally believed that the phenomenon of neutrino oscillations require neutrinos to have tiny masses.

50. Early Galaxy Formations

Section: Space Technology

Concept :

- In a new study, an international team of astrophysicists has discovered several mysterious objects hiding in images from the James Webb Space Telescope: six potential galaxies that emerged so early in the universe's history.

- The telescope made observations of a population of candidate **massive galaxies that formed around 500-700 million years after the Big Bang**.
- These galaxies are more massive than have been expected for this early point in time.
- These observations offer insights into early galaxy formation.
- If verified with spectroscopy, these findings **provide evidence to suggest that galaxies grew quicker than expected early in the history of the Universe**.
- Spectroscopy is the scientific study of the interaction between matter and electromagnetic radiation.
- It involves the analysis of the way in which different types of radiation (such as visible light, X-rays, and radio waves) interact with matter, such as atoms and molecules.

James Webb Space Telescope

- The telescope is the result of an **international collaboration between NASA, the European Space Agency (ESA) and the Canadian Space Agency which was launched in December 2021**.
- It is currently at a point in space known as the **Sun-Earth L2 Lagrange point**, approximately 1.5 million km beyond Earth's orbit around the Sun.
 - The Lagrange Point 2 is one of the five points in the orbital plane of the Earth-Sun system.
 - Named after Italian-French mathematician Joseph-Louis Lagrange, the points are in any revolving two-body system like Earth and Sun, marking where the gravitational forces of the two large bodies cancel each other out.
- Objects placed at these positions are relatively stable and require minimal external energy or fuel to keep themselves there, and so many instruments are positioned here.
- It's the **largest, most powerful infrared space telescope** ever built.
- It's the **successor to Hubble Telescope**.
- It can see backwards in time to just after the Big Bang by looking for galaxies that are so far away that the light has taken many billions of years to get from those galaxies to our telescopes.

51. Atacama Large Millimetre / submillimetre Array (ALMA) Telescope

Section: Space Technology

Concept :

- The Atacama Large Millimetre/submillimetre Array (ALMA), a radio telescope comprising 66 antennas is set to get software and hardware upgrades.
- It will help it collect much more data and produce sharper images than ever before, the journal Science reported recently.
- The most significant modernisation made to ALMA will be the replacement of its correlator, a supercomputer that combines the input from individual antennas and allows astronomers to produce highly detailed images of celestial objects.

About Atacama Large Millimetre/submillimetre Array (ALMA) Telescope:

- It is a **state-of-the-art radio telescope** that studies celestial objects at millimetre and submillimetre wavelengths.
- It is located in the **Atacama Desert of Northern Chile**.
- They can **penetrate through dust clouds and help astronomers examine dim and distant galaxies and stars out there**.
- It also has extraordinary sensitivity, which allows it to detect even extremely faint radio signals.
- The telescope consists of 66 high-precision antennas, spread over a distance of up to 16 km.
- It is **operated under a partnership between the United States, and 16 countries** in Europe, Canada, Japan, South Korea, Taiwan, and Chile.
- The radio telescope was designed, planned and constructed by the US's National Radio Astronomy Observatory (NRAO), the National Astronomical Observatory of Japan (NAOJ) and the European Southern Observatory (ESO).

What are some of the notable discoveries made by ALMA?

- Over the years, it has helped astronomers make groundbreaking discoveries, including that of starburst galaxies and the dust formation inside supernova 1987A.
- It had observed the detailed images of the protoplanetary disc surrounding HL Tauri which is a very young T Tauri star in the constellation Taurus, approximately 450 light years from Earth.
- It helped scientists observe a phenomenon known as the Einstein ring, which occurs when light from a galaxy or star passes by a massive object en route to the Earth, in extraordinary detail.

Why is ALMA located in Chile's Atacama Desert?

- ALMA is situated at an altitude of 16,570 feet (5,050 metres) above sea level on the **Chajnantor plateau in Chile's Atacama Desert** as the millimetre and submillimetre waves observed by it are very susceptible to atmospheric water vapour absorption on Earth.
- Moreover, the desert is the driest place in the world, meaning most of the nights here are **clear of clouds and free of light-distorting moisture** — making it a perfect location for examining the universe.

Atacama Desert

- The Atacama Desert is a 600-mile-long (1,000 kilometers) plateau in **the north of Chile, near the borders of Peru, Bolivia and Argentina in South America.**
- The Atacama Desert is the **driest nonpolar desert in the world**, as well as the only true desert to receive less precipitation than the polar deserts.
- In fact, it is so dry that some weather stations in the desert have never recorded a single drop of rain.
- As a result of these harsh conditions, **plant and animal life is almost non-existent, particularly in the lower Atacama Desert.**
- The northern coastal areas, however, do receive a little more rainfall, and as a result, are less arid.



52. \$5 Billion Defence Exports Target

Section : Defence

Concept :

- The defence ministry has set a target to **raise India's annual defence exports to \$5 billion by 2024-25, from the \$1.5 billion currently.**
- This was also reiterated by PM Modi at the recently concluded Aero India 2023 in Bengaluru earlier this month.

Current Defence Export Figures

- As per government data, **India's defence export value till December 2022 had reached Rs 6,058 crore.**
- India's defence exports have grown by 334 per cent in the past five years. They touched nearly Rs 13,000 crore in 2021-22.

Which defence equipment does India export?

- The major defence items being exported are Personal Protective items, Offshore Patrol Vessels, ALH Helicopter, SU Avionics, Bharati Radio, Coastal Surveillance Systems etc.
- Major items exported by India in the last three years include lightweight torpedoes, weapon locating radar, fast patrol vessels, 120 mm mortar armoured protection vehicle, 0.338 Lapua magnum sniper rifle, and simulators.

What are the major defence platforms India is looking to export?

- India is in talks with Argentina and Egypt, among other countries, to export its indigenous LCA Tejas.
- According to the government officials, the LCA Mk 2 has seen interest from nearly 16 countries and efforts are on to identify private production agencies to ramp up manufacturing of the jet.
- India is looking to export the indigenous Advanced Light Helicopter to several countries.
- India has signed a contract with Mauritius for the export of one Advanced Light Helicopter (ALH Mk III) for Mauritius Police Force.
- Mauritius already operates the ALH and Do-228 aircraft, which is a multi-purpose light transport aircraft.
- India is also in talks with Guyana to export the Dornier 228 and fast patrol vessels.
- Last year, India signed a \$375 million contract with the Philippines to export the BrahMos supersonic cruise missile.
- India is looking to export the weapon system and its lighter next generation version (BrahMos NG) to over 10 countries, including South Africa, Egypt, UAE, and Saudi Arabia.
- In 2022, Armenia inked a government-to-government deal to buy the DRDO-developed Pinaka multi-barrel rocket launchers, rockets and ammunition.

Major export destinations

- India's private companies and Defence PSUs currently export defence equipment to over 75 countries.
- **Major countries:** Italy, Maldives, Sri Lanka, Russia, France, Nepal, Mauritius, Israel, Egypt, UAE, Bhutan, Ethiopia, Saudi Arabia, Philippines, Poland, Spain and Chile are some of the major export destinations.

Top customers for India's defence export

- A report released by India Exim Bank stated that Mauritius, Mozambique, and Seychelles have been among the top customers for India's defence exports between 2017 and 2021.
- **India is among the top 25 exporters of major arms**
- According to a Stockholm International Peace Research Institute (SIPRI) report released last year, India is among the top 25 exporters of major arms.
- **Myanmar has been the biggest importer of Indian arms at 50 percent during the 2017-2021 period, followed by Sri Lanka at 25 percent and Armenia at 11 per cent.**

53. Jharkhand on alert as bird flu cases reported in State-run poultry farm: Official

Section :Health

Context: The presence of H5N1 variant was confirmed among a protein-rich breed of chicken, popularly known as 'Kadaknath' in Jharkhand.

Kadaknath, also called **Kali Masi** is an Indian breed of chicken. They originated from Dhar and Jhabua, Madhya Pradesh. These birds are mostly bred by the rural and tribals. There are three varieties: jet black, golden and pencilled. The meat from this breed has a geographical indication (GI Tag) tag that was approved by the Indian government on 30 July 2018.

Avian influenza (AI)

- Avian influenza (AI) is a highly contagious viral disease affecting several species of food-producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet birds and wild birds.
- Occasionally mammals, including humans, may contract avian influenza.
- Influenza A viruses are classified into subtypes based on two surface proteins, Hemagglutinin (HA) and Neuraminidase (NA). For example, a virus that has an HA 7 protein and NA 9 protein is designated as subtype H7N9.
- Avian influenza virus subtypes include **A(H5N1), A(H7N9), and A(H9N2)**.
 - HPAI A(H5N1) virus occurs mainly in birds and is highly contagious among them.
 - HPAI Asian H5N1 is especially deadly for poultry.
- **Prevention:** Strict biosecurity measures and good hygiene are essential in protecting against disease outbreaks.
- **Eradication:** If the infection is detected in animals, a policy of culling infected and contact animals is normally used in an effort to rapidly contain, control and eradicate the disease.

Highly Pathogenic Avian Influenza (HPAI):

- The two virus types identified so far in the outbreaks — H5N1 and H5N8 come under the category of Highly Pathogenic Avian Influenza (HPAI), which is of major concern to those keeping birds, because it leads to disease and death of fowl and causes economic havoc. H5N1 is a known threat to humans as well
- Out of the three types of influenza viruses (A, B, and C), influenza A virus is a zoonotic infection with a natural reservoir almost entirely in birds. Avian influenza, for most purposes, refers to the influenza A virus.
- Though influenza A is adapted to birds, it can also stably adapt and sustain person-to-person transmission.

Mode of transmission:

- Avian influenza is most often spread by contact between infected and healthy birds, though can also be spread indirectly through contaminated equipment.
- The virus is found in secretions from the nostrils, mouth, and eyes of infected birds as well as their droppings.
- HPAI infection is spread to people often through direct contact with infected poultry, such as during slaughter or plucking.

Is this influenza airborne?

- Though the virus can spread through airborne secretions, the disease itself is not an airborne disease.

Human to human transmission:

- In its present form, human-to-human infection is not known — human infections have been reported only among people who have handled infected birds or carcasses.

54. ISRO successfully conducts key rocket engine test for Chandrayaan-3

Section: Space Technology

Concept :

- The **flight acceptance hot test of the CE-20 cryogenic engines that will power the cryogenic upper stage of the launch vehicle for the Chandrayaan-3 mission** was successfully conducted, according to the Indian Space Research Organisation.

- The **hot test** was carried out for a **planned duration of 25 seconds at the High Altitude Test Facility of the ISRO Propulsion Complex at Mahendragiri** in Tamil Nadu on February 24, the Bengaluru-headquartered national space agency said.
- All the propulsion parameters during the test were found satisfactory and closely matched with predictions.
- The **cryogenic engine will be further integrated with the propellant tanks, stage structures and associated fluid lines** to realise the fully integrated flight cryogenic stage.
- **Flight acceptance test** is carried out with an **aim to confirm the integrity of the hardware, assessment of subsystems' performance and tune the engine** for meeting the mission requirements parameters.

IPRC Complex

- ISRO Propulsion Complex (IPRC), Mahendragiri is equipped with the state-of-the-art facilities necessary for realising the cutting-edge propulsion technology products for the Indian space programme.
- **The activities carried out at IPRC, Mahendragiri are: assembly, integration and testing of earth storable propellant engines, cryogenic engines and stages for launch vehicles; high altitude testing of upper stage engines and spacecraft thrusters** as well as testing of its sub systems; **production and supply of cryogenic propellants** for Indian cryogenic rocket programme, etc.
- A **Semi-cryogenic Cold Flow Test facility (SCFT)** has been established at IPRC, Mahendragiri for the **development, qualification and acceptance testing of semicryogenic engine subsystems**.
- IPRC is responsible for the supply of Storable Liquid Propellants for ISRO's launch vehicles and satellite programmes.
- IPRC delivers quality products to meet the zero defect demand of ISRO space programme ensuring high standards of safety and reliability.
- It also carries out Research & Development (R&D) and Technology Development Programmes (TDP) towards continued improvement of its contribution to the Indian space programme.

55. 'Organ on a chip': a tech which mimics disease systems in laboratory conditions

Section: Biotechnology

Concept: The passage of the Food and Drug Administration Modernization Act 2.0 by the US government in December 2022 is expected to provide momentum to the R&D of "organ chips".

Organ chips or Organ on a chip model

- Organ chips are **small devices with human cells that are used to mimic the environment in human organs** such as blood flow and breathing movements, that can act as synthetic environments to test new drugs.
- Such chips are translucent which helps provide a **window for researchers to look into the inner workings of the organ being studied**.
- Donald Ingber, a professor of bioengineering and director of the Wyss Institute at Harvard University along with his colleagues developed the first human organ-on-a-chip model in 2010.
- This **first organ-on-a-chip model was a "lung on a chip"** that resembled the biochemical aspects of the lung and its breathing mechanism.
- Later in 2014, members of the Wyss Institute started a startup named "Emulate Inc." to commercialise the organ-on-a-chip technology.
- This group of researchers at Emulate Inc has created various such different chips which include that of the epithelial barrier, bone marrow, kidney, gut, vagina and liver.


Significance

- The most significant advantage of using Organ on a chip technology is that it **can help predict how specific organs respond to the exposure of a potential chemical hazard found** in foods, cosmetics and/or dietary supplements with better precision than other methods currently in use such as cell-culture or animal-based tests.
- Further, the Organ on a chip model is seen to be an **alternative for clinical trials of drugs on animals** which are criticised widely as an unethical and scientifically bogus practice.
- Organ chips can thus help prevent the death of thousands of laboratory animals.
- The technology can be used to **identify, develop, and test novel drugs to treat a host of different diseases in a reliable manner** and predict treatment outcomes better than conventional systems.
- Example: the liver chips developed by Emulate Inc could predict the ability of drugs to cause liver injury with 87% sensitivity and 100% specificity.
- Further, the **liver chips were used to assess the toxic effects of 27 drugs known to be either safe or unsafe for human livers**.
- The organ chips developed from **isolating cells from a patient to develop biomimetic tissues that mimic a specific disease** can be used to **extend personalised therapies for individual patients**.

Organ chips in India

- A few of the research groups in India have also involved **themselves in developing new organ-on-chip models**.

- Researchers and experts at the Institute of Chemical Technology, Mumbai along with a team of chemical engineers at IIT Bombay have developed a skin-on-chip model.
- This model is being tested for studying skin irritation and toxicity.
- This group of experts has also developed a retina-on-chip model.
- Researchers in India are also developing a placenta-on-chip model.
- Apart from organs, researchers are also trying to mimic different diseases using organ chips.
- A team of experts at the Savitribai Phule Pune University (SPPU), have developed an infection-on-a-chip model to recreate a human skin wound infection state.
- The objective is to mimic an infection that doesn't heal despite repeated antibiotic treatment.



LAQSHYA 2023

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UNION PUBLIC SERVICE COMMISSION
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Civil Services (PRELIMINARY) Examination, 2016

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