# DAILY PRELIMS NOTES COMPILATION
# APRIL 2023

## To be the best
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**DEFENCE**

**1. Cope India Exercise**

**Concept :**

- The `Cope India' exercise between India and US from April 10 to 21 will "further enhance operational capability and interoperability between the two air forces".

**Background**

- Cope India **began in 2004 as a fighter training exercise** held at Air Station Gwalior, India.
- The exercise has evolved to incorporate subject matter expert exchanges, air mobility training, airdrop training and large-force exercises, in addition to fighter-training exercises.
- The exercise showcases U.S. and India's efforts and commitment to a free and open Indo-Pacific region.

**About the exercise**

- It is a **bilateral exercise between the air forces of the two countries**.
- The exercise **comes amid India's continuing three-year-long military confrontation with China in eastern Ladakh as well as the ongoing Russia-Ukraine war,** which has seen Beijing and Moscow get into a tighter strategic clinch.

**Aircrafts :**

- The IAF will be fielding the **French-origin Rafale, Russian-origin Sukhoi-30MKI and indigenous Tejas fighters as well as AEW&C** (airborne early-warning and control) planes, C-**17 Globemaster-III strategic airlift aircraft** and **IL-78 mid-air refuellers** for the exercise.
- The US, in turn, will **deploy F-15 Strike Eagle jets.**

**ECONOMY**

**1. New Foreign Trade Policy**

**Concept :**

- Union Minister of Commerce and Industry, Shri Piyush Goyal, recently launched the Foreign Trade Policy 2023.

**Foreign Trade Policy 2023:**

- Foreign Trade Policy (2023) is a policy document which is based on continuity of time-tested schemes facilitating exports as well as a document which is nimble and responsive to the requirements of trade.
- The Key Approach to the policy is based on these 4 pillars –
- Incentive to Remission,
- Export promotion through collaboration – Exporters, States, Districts, Indian Missions,
- Ease of doing business, reduction in transaction cost and e-initiatives and
- Emerging Areas – E-Commerce Developing Districts as Export Hubs and streamlining SCOMET policy.

**Key Highlights of FTP 2023:**
**Process Re-Engineering and Automation** :

- Greater faith is being reposed on exporters through automated IT systems with risk management system for various approvals in the new FTP.
- The policy emphasizes export promotion and development, **moving away from an incentive regime to a regime which is facilitating,** based on technology interface and principles of collaboration.
- FTP 2023 **codifies implementation mechanisms in a paperless, online environment, building on earlier 'ease of doing business' initiatives**.
- **Reduction in fee structures and IT-based schemes** will make it easier for MSMEs and others to access export benefits.
- **Duty exemption schemes for export production** will now be implemented **through Regional Office**s in a rule-based IT system environment, eliminating the need for manual interface.

**Towns of Export Excellence:**

- Four new towns, namely **Faridabad, Mirzapur, Moradabad, and Varanasi, have been designated as Towns of Export Excellence** (TEE) in addition to the existing 39 towns.
- **Towns of Export Excellence** is a **status provided to those towns which produce and export goods worth a minimum value in a specific sector**.
- Sectors include handicraft, handloom, seafood, pharmaceutical, fisheries, apparel, coir, leather products, etc.
- Once a town is recognized as a TEE it helps in maximizing its potential and enables them to move higher in the value chain.

- According to the Ministry of Commerce and Industry, **towns producing goods worth Rs 750 crore (US$ 98.7 million) or more can be recognized as Towns of Export Excellence.** For certain sectors like handloom, handicraft, agriculture, and fisheries the threshold limit is set at Rs 150 crore (US$ 19.7 million).
- The TEEs will have **priority access to export promotion funds under the MAI scheme** and will be able to avail Common Service Provider (CSP) benefits for export fulfillment under the EPCG Scheme.
- **Market Access Initiative (MAI) Scheme** is an **Export Promotion Scheme** envisaged to act as a catalyst to promote India's exports on a sustained basis.
- The objective of the **Export Promotion Capital Goods (EPCG) Scheme** is to **facilitate import of capital goods** for producing quality goods and services and enhance India's manufacturing competitiveness.
- This addition is expected to boost the exports of handlooms, handicrafts, and carpets.

**Recognition of Exporters :**

- Exporter firms recognized with 'status', based on export performance, will now be partners in capacity-building initiatives.
- Similar to the "each one teach one" initiative, 2-star and above status holders would be encouraged to provide trade-related training based on a model curriculum to interested individuals.
- This will help India build a skilled manpower pool capable of servicing a $5 trillion economy before 2030.
- Status recognition norms have been re-calibrated to enable more exporting firms to achieve 4 and 5-star ratings, leading to better branding opportunities in export markets.

**Promoting Export from the Districts :**

- The FTP aims at building partnerships with State governments and taking forward the **Districts as Export Hubs (DEH) initiative** to promote exports at the district level.
- **District specific export action plans** to be prepared for each district outlining the district specific strategy to promote export of identified products and services.
- **District Export Hub Initiative**
- Nodal Ministry: Ministry of Commerce and Industry.
- It is a **Centrally Sponsored Scheme**.
- The Scheme will be **part of the new Foreign Trade Policy**(FTP).
- Aim: To help producers across 200 districts scale up manufacturing and find foreign buyers for their goods.
- Implementing Body: **Directorate General of Foreign Trade(DGFT).**
- Under the scheme, **District Export Promotion Committees(DEPCs) have been constituted** in most of the districts and products and services with export potential have been identified in each district.

**Streamlining SCOMET Policy :**

- India is placing more emphasis on the "export control" regime as its integration with export control regime countries strengthens.
- There is a wider outreach and **understanding of SCOMET among stakeholders**.
- **SCOMET** item is an acronym for **Special Chemicals, Organisms, Materials, Equipment, and Technologies**, and **these are dual-use items** that can be used for both civilian and military applications.
- India's **Foreign Trade Policy regulates the export of items on the SCOMET List**. The exporter must obtain a license from the Directorate General of Foreign Trade, Ministry of Commerce, to export SCOMET.

**Facilitating E-Commerce Exports :**

- E-commerce exports are a promising category that requires distinct policy interventions from traditional offline trade.
- Various estimates suggest India's e-commerce export potential in the range of $200 to $300 billion by 2030.
- FTP 2023 outlines the intent and roadmap for establishing e-commerce hubs and related elements.
- As a starting point, the **consignment wise cap on E-Commerce exports through courier has been raised from ₹5Lakh to ₹10 Lakh in the FTP 2023.**
- **Facilitation under Export Promotion of Capital Goods (EPCG) Scheme**
- The EPCG Scheme, which allows import of capital goods at zero Customs duty for export production, is being further rationalized. Some key changes being added are:
- **Prime Minister Mega Integrated Textile Region and Apparel Parks (PM MITRA)** scheme has been added as an **additional scheme eligible to claim benefits under the CSP (Common Service Provider) Scheme** of Export Promotion Capital Goods Scheme (EPCG).
- **Dairy sector to be exempted from maintaining Average Export Obligation** – to support the dairy sector to upgrade the technology.
- **Battery Electric Vehicles (BEV) of all types**, Vertical Farming equipment, Wastewater Treatment and Recycling, Rainwater harvesting system and Rainwater Filters, and Green Hydrogen **are added to Green Technology products** – will **now be eligible for reduced Export Obligation requirement under EPCG Scheme..**

**Facilitation under Advance authorization Scheme :**

- **Advance authorization Scheme** accessed by **Domestic Tariff Area (DTA)** units provides duty-free import of raw materials for manufacturing export items.
- Based on interactions with industry and Export Promotion councils, certain facilitation provisions have been added in the FTP 2023.
- **Advance Authorisation Scheme** allows the **duty-free import of inputs, which are physically incorporated in an export product.** In addition to any inputs, packaging material, fuel, oil, and catalyst which is consumed/utilized in the process of production of export product, is also allowed.
- **Only Exporter (either merchant or manufacturer) who holds an AEO Certification** (Authorized Economic Operator) is **eligible to opt for this scheme**.
- The inputs imported are exempt from duties like Basic Customs Duty, Additional Customs Duty, Education Cess, Anti-dumping duty, Safeguard Duty and Transition Product-Specific Safeguard duty, Integrated tax, and Compensation Cess, wherever applicable, subject to certain conditions.

**Amnesty Scheme**

- Finally, the **Government is strongly committed to reducing litigation and fostering trust-based relationships t**o help alleviate the issues faced by exporters.
- In line with "**Vivaad se Vishwaas" initiative**, which sought to settle tax disputes amicably, the **government is introducing a special one-time Amnesty Scheme under the FTP 2023 to address default on Export Obligations.**
- This scheme is intended to **provide relief to exporters who have been unable to meet their obligations under EPCG and Advance Authorizations**.

*For further notes on PM MITRA , refer* – https://optimizeias.com/pm-mitra-parks/

**2. India's unemployment rate rises to 3-month high of 7.8% in March**

**Context**: India's unemployment rate rose to a three-month high in March to 7.8percentasthecountry'slabour markets deteriorated, according to data from the Centre for Monitoring Indian Economy (CMIE).
**Concept:**

- Unemployment rate is defined as the percentage of persons unemployed among the persons in the labour force.

**PLFS**

- NSO launched the PLFS in April 2017. The first annual report (July 2017-June 2018) was released in May 2019
- According to the third annual report on Periodic Labour Force Survey (PLFS), conducted by the NSO between July 2019 and June 2020, the unemployment rate fell to 4.8 per cent in 2019-20
- . In 2018-19, it stood at 5.8 per cent and 6.1 per cent in 2017-18.

**CMIE**

- According to the Centre for Monitoring of Indian Economy (CMIE), the monthly jobless rate which rose to 23.52 per cent in April 2020, it was 10.18 per cent in June 2020,
- CMIE is a leading business information company. It was established in 1976, primarily as an independent think tank.
- CMIE produces economic and business databases and develops specialised analytical tools to deliver these to its customers for decision making and for research. It analyses the data to decipher trends in the economy.

**3. Zee insider trading: Sebi bans 3 individuals from securities market**

SEBI has barred three individuals from the securities market for two years and imposed penalty totalling Rs90 lakh on the mina case pertaining to insider trading activities in the scrip of Zee Entertainment Enterprises Ltd (ZEEL).
**Insider Trading**

- Insider trading is the buying or selling of a publicly-traded company's shares/debt papers by someone who has confidential information about that shares/debt papers.
- Insider trading is defined as a malpractice wherein trade of a company's securities is undertaken by people who by virtue of their work have access to the otherwise non-public information/confidential information which can be crucial for making investment decisions.
- When insiders, e.g. key employees or executives who have access to the strategic information about the company, use the same for trading in the company's stocks or securities, it is called insider trading.
- An insider is a person who possesses either access to valuable non-public information about a corporation or ownership of stock equaling more than 10% of a firm's equity. This makes a company's directors and high-level executives insiders.

**Mechanism to prevent insider trading**

- According to SEBI Promoters will be held responsible for violation of insider trading norms, if they possess unpublished price-sensitive information (UPSI) regarding the company without any "legitimate purpose".

- **Legitimate purpose** – Sharing of the UPSI by an insider with partners, collaborators, lenders, customers, suppliers, merchant bankers, legal advisors, auditors, insolvency professionals or other advisors or consultants, provided that such sharing has not been carried out to evade or circumvent the prohibitions of these regulations.

## Recommendation of Kotak committee

- The committee has recommended flow of unpublished price sensitive information (UPSI) shall be considered for 'legitimate purpose', and not an offence under the SEBI (Insider Trading) for those who:
  - Is part of the promoter group.
  - Has a nominee director on the board.
- The information should be pursuant to a formal agreement in accordance with the regulations.
- Communication of information must comply with the Insider Trading Regulations.

## 4. India and Malaysia can now use Indian rupee to settle trade, says MEA

**What has happened?**
India and Malaysia have agreed to settle trade in the Indian rupee, the Ministry of External Affairs announced on Saturday
**How it will happen?**

- The India International Bank of Malaysia(IIBM) has already operationalized this mechanism by opening a special Rupee Vostro account through its corresponding bank in India, Union Bank of India.

**What is Vostro Account?**
Vostro accounts are used to make payments in domestic currency. The opening of this account will allow Malaysia to use the Indian Rupee to settle trade payments. This move is expected to be beneficial for both India and Malaysia. It will eliminate the need for foreign exchange conversion and will reduce transaction costs. This development is also expected to lead to increased trade between the two countries, especially in areas such as textiles, automobiles, and electronics.
**Why it is significant?**
The announcement is seen as a decisive step towards dedollarisation and an effort to safeguard Indian trade from the impact of Russia's war in Ukraine and its subsequent fallout and sanctions
**What is De-dollarization?**
De-dollarization is a process of substituting the US dollar as the currency used for:
Trading oil and/ or other commodities

- Buying US dollars for the forex reserves
- Bilateral trade agreements
- Dollar-denominated assets

It happens when the leading central banks diversify their reserves away from the USD to other assets or currencies like the Euro, Renminbi or gold.
The USD (United States Dollar) has been the world's dominant currency since the conclusion of the second world war. Dollar has also been the most sought reserve currency for decades, which means it is held by central banks across the globe in significant quantities. Dollar is also primarily used in cross-border transactions by nations and businesses.
This unique position not only makes the US the leader in the financial and monetary system, but also provides incomparable leverage when it comes to coercive ability to shape decisions taken by governments, businesses, and institutions.
**Causes of this shift:**

- The USD as a sanctions weapon-The US has for long used imposition of sanctions as a tool to achieve foreign policy and goals, which entails restricting access to US-led services in payment and financial transaction processing domain
- The emergence of China,
- Slowdown in the US economy,
- European Union's independent policy assertion,
- Russia-US detachment, and us-china trade war
- increasing voices from across the world to create a polycentric world and financial system in which hegemonic capacities can be muted.
- The rise of digital or cryptocurrencies at an increasing pace.

**Examples**

- Dedollarization emerged as a priority for Russia in 2014 in response to the imposition of Western sanctions following the annexation of Crimea that limited the ability of state firms and banks to raise financing in Western markets.
- Between 2013 and 2020, the Russian central bank halved its dollar-denominated reserves. In 2021, it revealed plans to completely ditch all dollar assets from its sovereign wealth fund and increase holdings in euros, yuan, and gold instead, thus acquiring a quarter of the world's yuan reserves.
- China also began seeing value in this initiative after the onset of the US-China trade war in 2018 and the use of punitive financial measures by the US.
- EU members had switched to INSTEX (Instrument in Support of Trade Exchanges) which acts as a special-purpose vehicle to facilitate non-USD trade with Iran to avoid US sanctions

- The EU remains the largest investor as well the biggest trade partner for Russia, with trade taking place in euros, instead of dollars.
- Further, in recent years, Russia has also switched to settlements in national currencies with India (for arms contracts) and the two traditionally strong defence partners are aiming at exploring technology as means for payment in national currencies.

**Impact**

- **Reduce trade volatility and risk**-The "de-dollarisation" by several central banks is imminent, driven by the desire to insulate them from geopolitical risks, where the status of the US dollar as a reserve currency can be used as an offensive weapon.
- **As an alternative to economic sanctions.**
- Reduce demand of USD thus, relative **depreciation of USD and imported inflation in the USA.**
- **Push to globalisation**
- **Reduce3 spillover effect of economic crisis in one country to global economy**
- **Challenges**
- **Finding alternatives to the dollar-**currency with the right amount of availability, acceptability and stability.
- Given the psychological bias, the world will continue to prefer the USD as a "store of value" and a "medium of exchange", fulfilling the basic functions of money.
- Sudden dumping of dollar assets by adversarial central banks will also pose balance sheet risks to them as it will erode the value of their overall dollar-denominated holdings.
- No full proof from sanctions – increasing reliance on the euro and thus greater exposure to EU sanctions;
- Finding true exchange rate-US dollar being the link currency for determining the exchange value of any two currencies
- A new international payments system that could operate as an alternative to the US-dominated SWIFT, as international trade needs a payment and financial system to take place
- Dollar's continued primacy as the medium of exchange in international currency markets, selling euros in exchange for rubles is likely to be difficult without going through the dollar, as Iran learned a few years ago.
- Increase economic autonomy

**De Dollarization and India:-**India, currently among the most dollarized countries (in invoicing) and hence relatively difficult to switch to other modes given the economic and political relation with the USA. However,

- While others accumulate dollars from their earnings of trade surplus, India maintains a large forex reserve even though India imports less than it exports. In India's case, the dollar reserves come through infusion of Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI), which reflects the confidence of foreign investors in India's growth prospects. Thus, India is less impacted by economic sanctions of the USA.
- Just like Chinese renminbi, Indian rupee is also not yet fully convertible at the exchange markets. While this means that India can control its burden of foreign debt, and inflow of capital for investment purposes in its economy

India remains vulnerable to policy changes by other nations' monetary policies which are beyond India's own control. For instance, it has been often highlighted that a tightening of the US monetary policy leads to capital outflows (capital flight) from India, thus impacting India adversely.

**Alternatives:** Instead of switching dependence from the USD to any other currency like euro, yuan or backing currency to the 'old gold' will not solve the problem but repeat the crisis the global economy went through pre-Bretton Woods times.

- Currency swap agreements
- A central bank digital currency (CBDC) that bypasses the dollar-China submitted a "Global Sovereign Digital Currency Governance" proposal at the Bank for International Settlements to influence global financial rules via its digital currency, the e-Yuan.
- A global currency or an arrangement like the IMF's SDR
- Introduction of a new Russia-China payment system, bypassing SWIFT and combining the Russian SPFS (System for Transfer of Financial Messages) with the Chinese CIPS (Cross-Border Interbank Payment System).
- National electronic payments system-like Russia's Mir or India's UPI

**5. MPC may hike repo rate by 25 bps before a pause**

**Context:** Against the global balancingact between hiking interest rates,withdrawingsystemicliquidityandtheseriesofrecentbankfailures,theReserveBankofIndia's Monetary Policy Committee(MPC) is likely to raise the policyratebyanother 25 bps in**its first bimonthly monetary policy for FY24**, taking cognizance of the contagion impact on the Indian economy

**Can policy rate hikes alone control inflation?**

- Inflation numbers for the first two months of 2023 have once again crossed the 6 per cent barrier of the RBI. **Food** and **core inflation** remained stubbornly high in February, above 6 per cent.
- According to internal research conducted by RBI, inflation exceeding 6 per cent would have **adverse effects on India's growth.**

- It would negatively impact the financial savings and investment climate. Thus, the RBI's rate hikes are a no-brainer.
- As the monetary policy framework mandates, the primary job of the RBI is to keep inflation in check. Therefore, few would disagree with the RBI's rate hikes.
- The dominant role of commodity prices in India's retail inflation has reignited the discussion on whether it is necessary to focus on targeting headline inflation. But these transitory fluctuations in headline inflation caused mainly by food prices can also lead to a rise in non-food or core inflation due to higher inflation expectations. Economist James Walsh, in a 2011 IMF working paper, 'Reconsidering the Role of Food Prices in Inflation', points to evidence that a policy focus on core inflation can mis-specify inflation, leading to higher inflationary expectations, a downward bias to forecasts of inflation and lags in policy responses.
- In a study, 'Explaining Inflation in India: The Role of Food Prices', Prachi Mishra and Devesh Roy examined whether food inflation affects non-food inflation in India. They found a significant pass-through effect from food price inflation to non-food inflation
- Renowned economist Nicholas Kaldor argued that monetary policy is not an effective tool to control inflation that is caused by supply-side factors, particularly those arising from the agricultural sector. Since monetary policy typically deals with the demand side of the economy, it cannot address inflation stemming from the agricultural sector. In their 2022 paper, 'What lowered inflation in India: monetary policy or commodity prices?', economists Pulapre Balakrishnan and M Parameswaran argue for a new set of **instruments to control inflation arising from commodity prices.**

**Impact of US FED policy:**

- In its latest meeting, the US Federal Reserve increased the interest rate by 25 basis points to 5 per cent. **This reduces the difference between interest rates in the US and India, which triggers a set of chain reactions, including capital outflow, rupee depreciation, depletion of forex reserve, and current account deficit**. This will prompt a rate hike from the RBI so as to contain the interest rate differential between India and the US.
- After adopting the flexible inflation targeting (FIT) framework, India's average inflation declined notably compared to previous periods. CPI inflation, which is targeted in the framework, and WPI inflation were low and stable. Stable international commodity prices and moderation of minimum support prices also played an important role in stable inflation figures up to 2019. Inflation targeting, therefore, does not offer a complete solution to the inflation problem of developing countries like India prone to high exposure to supply shocks.
- The April MPC would consider an interest rate hike by more than 25 bps as inflation has gone beyond the projected level this quarter. The central bank, to achieve its long-term goal of stable inflation and growth, would have to look at different instruments to reduce the impact of **supply shock-induced inflation volatility.**

**6. The NPCI's new circular on levy charges**

**Concept :**

- The National Payments Corporation of India (NPCI), which governs the Unified Payment Interface (UPI), **directed the banks that they can now levy charges on merchant transactions made via Prepaid Instrument wallets using UPI.**
- As these directions by NPCI got leaked to the media, the NPCI clarified that the usual bank-to-bank UPI transactions would not be charged and that customers will not have to pay for transactions made via Prepaid Payment Instruments (PPI) on UPI.
- **NPCI clarified that the new interchange charges are only applicable for PPI merchant transactions.**

**Prepaid Payment Instruments (PPIs)**

- Prepaid Payment Instruments (PPIs) are a type of payment method that is **used to purchase various goods and services as well as send or receive money by using the stored value in the wallet.**
- Under the PPI mode of transaction, the **users must pre-load the digital wallet with a desired amount** by using cash, or debit to a bank account, by credit/debit cards, or UPI.
- PPIs can be in the **form of mobile wallets, vouchers, secure tokens, physical smart cards, or any other form** that allows access to prepaid funds.
- The most **prevalent form of PPI used in India at present is the mobile wallet**.
- It is to be noted **that PPIs can only be used in Indian rupees.**

**PPI interoperability**

- Earlier, in order to use PPI at any merchant, it was mandatory for the respective merchant to be engaged directly by the specific PPI issuer (specific network).
- The PPIs with which the merchant did not have a direct tie-up used to get rejected.
- This provision restricted the customers of one specific mobile wallet to use the money in the wallet only at those merchant locations which had a direct tie-up with the same PPI wallet provider.
- i.e. if a customer had a Paytm wallet, he/she could only use the money in the wallet for making payments to those merchants who accepted Paytm QR codes.
- The **RBI has now mandated interoperability among different PPI wallet providers** to address the issues associated with this limitation of PPIs.

- The PPI issuers have now tied up with NPCI for issuing interoperable RuPay PPI cards and for developing interoperable wallets on UPI rails.
- PPIs in the form of mobile wallets can now be linked to UPI which creates interoperable wallets on UPI rails.

**Working of PPI interoperability through UPI**

- Linking one's PPI wallet to UPI would enable individuals to transact using the Scan and Pay option on all UPI interoperable QR codes and facilitate the use of PPI wallets at all merchant locations.
- With the help of PPI interoperability, individuals can also send or receive money to any other wallet user.
- Likewise, a merchant with any UPI QR code would be able to accept payments from any PPI issuer or mobile wallet.
- PPI on UPI is expected to increase the incidence of merchant transactions in rural areas and enhance digital financial inclusion by catering to services such as healthcare, education, utility bills, transit, etc.



## Perks Of PPI Interoperability

**For Merchants**
- Accept more wallet payments
- Greater digital payment adoption
- Less cash management
- Effective substitute to bank accounts
- Increased limit from 1 Lakh to 2 Lakhs
- No need for multiple wallet integration

**For Customers**
- Consumer friendly
- Higher financial inclusion and penetration
- Encourage more innovation
- Seek quick redressals from issuers
- Higher use cases

**For PPI Issuers**
- Quasi-Banks
- Better access to payment infrastructure
- No additional infrastructure cost
- Additional sources of revenue

**7. Open-Source Seeds Movement**

**Concept :**

- As public sector breeding declined and the private sector began to dominate the seed sector, the need for alternatives became keenly felt to safeguard the plant varieties and indigenous seeds.

**Background**

- Farmers have innovated and shared seeds without any intellectual property rights (IPR) claims for centuries.
- Farmers also haven't sought exclusive rights over seeds and germplasm to prevent others from innovating on the seeds.
- In 1999, a **Canadian plant-breeder named E. Michaels** suggested an approach to seeds based on **the principles of open source software.**
- **Seed movement** is required to **provide proper rights to the plant breeders**.

**Open -Source Seed**

- An open-source crop variety is one that **is not restricted by plant patents or other proprietary limitations used by F1 hybrids and crops of CMS and GMO technologies.**
- The **open-source seed movement affirms that plant genetics and their physical traits cannot, and should not, be owned by individuals or corporations**.
- In other words, **plants should never be privatized or restricted** because they are a collective resource.
- The genetics of open-source seeds are protected and pledged to forever remain in the public domain.
- The **Open Source Seed Initiative s**imply asks for a pledge, that an individual won't "restrict others' use of these seeds or their derivatives by patents or other means, and to include this pledge with any transfer of these seeds or their derivatives".

**State of such Initiatives in India**

- Open Worldwide, the number of seed firms using open source models and the crop varieties and seeds made available there under is small but growing. **India is yet to test and adopt it widely.**
- Under the **Plant Variety Protection and Farmers' Rights Act (PPVFRA) 2001**, **farmers can register varieties as 'farmer varieties'** if they meet certain conditions, and have the right to reuse, replant, and exchange seeds.
- However, **they can't breed and trade in varieties protected under the Act for commercial purposes**.

- Using the **open source approach here will enable farmers to gain more rights over germplasm and seeds and facilitate innovation**. So there is a need to test this approach with farmers and the three FPOs can take the lead.

**How is Intellectual Property protected in agriculture?**

- In effect, there are now **two forms of IPR protection in agriculture**: **plant-breeders' rights and patents.**
- Traditionally, **farmers and cultivators have innovated and shared seeds without any intellectual property rights (IPR) for centuries.**
- However, the **advent of hybrid seeds and advancements in scientific plant-breeding have led to the grant of plant breeders' rights (PBR) and patents.**
- As per PBR and patents regime, rights-holders can demand royalty on seeds and legally enforce intellectual property rights (IPR) and in the case of a few regimes, rights-holders can also limit the unauthorised use of such seeds.
- Together, **they restrict farmers' rights and the freedom to develop new varieties using germplasm from IP-protected varieties.** They have thus further consolidated the seed sector and increased the number of plant varieties covered by IPRs.
- The high prices of genetically modified seeds and IP claims triggered many problems, including the State's intervention on Bt cotton seeds in India.
- As public sector breeding declined and the private sector began to dominate the seed sector, the need for alternatives became keenly felt.
- This is when the success of open-source software inspired a solution. In 1999, a Canadian plant-breeder named T.E. Michaels suggested an approach to seeds based on the principles of open-source software.

**Concerns associated with IPR protection in the agriculture sector**

- There are mainly two modes of IPR protection in agriculture namely plant-breeders rights (PBR) and patents.
- These modes of IPR protection have restricted the rights of the farmers and the freedom to develop new varieties using germplasm from IP-protected varieties.
- Further, the high costs and prices associated with genetically modified seeds and IP claims have given rise to various problems and issues which have led to the State's intervention in Bt cotton seeds in India.
- Also, the IPR regime in agriculture has led to the decline of public-sector breeding and the domination of private companies in the seed sector.

**8. FM review financial inclusion schemes**

**Context**: The review meeting, which will be chaired by DFS Secretary Vivek Joshi, will cover Jansuraksha Schemes, Pradhan Mantri Mudra Yojana, Stand UP India and PM SVANidhi scheme, sources said.

PM SVANidhi scheme

- It is a special **micro-credit facility scheme for providing affordable loan to street vendors**.
- The scheme is aimed at enabling the street vendors to resume their livelihoods that have been adversely affected due to COVID-19 lockdown.
- Under the scheme, each of these streets vendors **will be given a credit loan of Rs 10,000, which they can return as monthly installments within a year.**
- Those who repay their loans on time will **get 7 percent annual interest as subsidy** which will be transferred in their bank accounts. There is no provision for penalty
- The scheme targets to benefit over **50 lakh street vendors**, who had been vending on or before 24th March this year, **in urban areas**. The duration of the scheme is till March 2022. The street vendors belonging to the **surrounding peri-urban or rural areas are being included as beneficiaries under the urban livelihoods programme for the first time.**
- The lending institutions under the Scheme include Scheduled Commercial Banks, Regional Rural Banks, Small Finance Banks, Cooperative Banks, NBFCs, Micro Finance institutions and Self Help Group banks.

**Jan Suraksha Schemes**

- It comprises of Pradhan Mantri Suraksha Bima Yojana which offer Rs. 1000 to Rs. 5000, Pradhan Mantri Jeevan Jyoti Bima Yojana offering Rs. 1 lakh to Rs. 2 lakh for accidents, and Atal Pension Yojana offering Rs.2 lakh insurance cover.
- Following the success of the Pradhan Mantri Jan Dhan Yojana scheme, an accidental cover scheme, which became a hit with the citizens of the country, the Modi-led government has introduced three new schemes known as the Jan Suraksha Schemes. The schemes cover areas such as insurance for the poor, pension and so on.

**The three schemes introduced under the Jan Suraksha Schemes are,**
1. **Pradhan Mantri Suraksha Bima Yojana**
2. **PradhanMantriJeevanJyotiBimaYojana**
3. **Atal Pension Yojana**

The schemes were simultaneously launched in 160 cities and towns across India.

**1. Pradhan Mantri Suraksha Bima Yojana**

The Pradhan Mantri Suraksha Bima Yojana was introduced by the government to encourage the citizens of India to get insurance access and coverage. The minimum annual premium for the scheme is Rs.12, and subscribers are given two types of insurance coverage – Accidental death or complete disability and partial disability insurance cover. The terms for both types of insurances

are between 2 to 4 years. The insurance cover for partial disability is up to Rs.1 lakh and for complete disability or death is Rs.2 lakh. The tax-free premium is debited from one's bank account automatically in the case of a long-term insurance plan. Subscribers can nominate their family members, who would receive the insurance coverage in the case of death or complete disability.

**The eligibility criteria for the scheme are:**

- Should be an Indian resident between the ages of 18 to 70 years.
- Should have a savings account with any bank in India, from which the premiums would be automatically debited.
- Should provide his/her Aadhaar card and regular KYC documents when applying.
- Every Indian citizen is eligible for the scheme.

**2. PradhanMantriJeevanJyotiBimaYojana**

- With only 20% of the country's population having insurance, the Pradhan Mantri Jeevan Jyoti Bima Yojana was introduced to provide insurance for the poor of the country and raise awareness on the need for an insurance cover. The premium of the scheme is at an affordable Rs.330 per annum and the risk coverage per annum is at Rs.2 lakh. While applying for the scheme, subscribers can nominate a person, usually family members, to avail the insurance in the case of complete disability or death. The scheme can be availed from any public insurance company across the country.

The eligibility criteria are mentioned below:

- The applicant should be between 18 to 50 years of age.
- Should be an Indian resident.
- Should have a savings bank account from which the annual premium is automatically debited.
- Should have an Aadhaar card and regular KYC documents when applying.

Since the introduction of the Jan Suraksha Schemes, over 63 million Indians have subscribed to either the Pradhan Mantri Suraksha Bima Yojana, the Atal Pension Yojana or the Pradhan Mantri jeevan Jyoti Bima Yojana at banks across the country making the Jan Suraksha yet another successful move by the government.

**3. The Atal Pension Yojana**

The Atal Pension Yojana was introduced by the Modi-led government to make amends to the already existing National Pension Scheme. In a bid to make the people of India aware of the necessity of having a retirement corpus, either as an investment or to earn a monthly pension, the Atal Pension Yojana aims at giving pensioners a fixed monthly income. Subscribers of this scheme are not allowed to make withdrawals before the time of maturity – retirement age or 60 years – and can earn a monthly pension income between Rs.1,000 to Rs.5,000, depending on their contribution through the tenure.

**The eligibility criteria for Atal Pension Yojana are listed below:**

- The subscriber when applying should be between 18 to 20 years of age as a minimum of 20 years of contribution before retirement is required.
- Should have a savings account from which the contribution will be automatically debited towards the scheme.
- Should provide the regular KYC documents, preferably Aadhaar card.
- Should have their mobile registered with the bank holding their account.

**Financial Index**

- The Reserve Bank of India(RBI) announced the formation of acomposite Financial Inclusion Index (FIIndex) tocapture the **extent of financial inclusion across the country.**
- The FIIndex for the **period ended March 2021 stood at53.9** compared with 43.4 for the period ended March 2017.
- The annual FIIndex will be **published in July every year**, the RBI said in a release.
- The index incorporates details of banking, investments, insurance, postal as well as the pension sector in consultation with the government and respective sectoral regulators.
- The index captures information on various aspects of financial inclusion in a single value ranging between 0 and 100, **where 0 represents complete financial exclusion** and **100 indicates full financial inclusion**.
- The FI Index comprises three broad parameters (weights indicated in brackets)
  - **Access (35 percent),**
  - **Usage (45 percent), and**
  - **Quality (20 per cent**) with each of these consisting of various dimensions, which are computed based on a number of indicators.
- It has been constructed **without any 'base year'.**
- A unique feature of the index is the **Quality parameter** that captures the quality aspect of financial inclusion as reflected by financial literacy, consumer protection, and inequalities and deficiencies in services

**8. RBI to set up portal to search across multiple banks for unclaimed deposits**

**What is the news?**

The Reserve Bank of India (RBI) has decided to develop a centralised web portal for public to enable search across multiple banks for possible unclaimed deposits based on user inputs.

**How will it happen?**

The search results will be enhanced by use of certain artificial intelligence (AI) tools.

**What happens to unclaimed deposits now?**

At present, the depositors and beneficiaries of unclaimed bank deposits of 10 years or more have to go through the website of multiple banks to locate such deposits. Now, in order to improve and widen the access of depositors or beneficiaries to information on such unclaimed deposits it has been decided to develop a web portal. This will help depositors or beneficiaries to get their deposits back.

**How much unclaimed deposits at present?**

The total amount of unclaimed deposits transferred to the Reserve Bank of India (RBI) by public sector banks (PSBs) in respect of deposits no operated for 10 years or more was Rs 35,012 crore till February 2023 as against Rs 48,262 in March 2022

Currently, deposits remaining unclaimed for 10 years in a bank are transferred to the Depositor Education and Awareness (DEA) Fund maintained by RBI.

## 9. RBI's repo rate pauses

**Concept :**

- The RBI has **raised the repo rate by 250 basis points (bps) since May 2022**, thereby **increasing the external benchmark-based lending rate (EBLR), by 250 bps**. The hike in Repo Rate was in a bid to rein in inflation.
- Banks have also raised the lending rate linked to the marginal cost of funds-based lending rate (MCLR) in the past 11 months.
- The focus was on withdrawing liquidity through a tight money policy to combat inflation.

**The recent decision**

- The **decision to keep the repo rate unchanged was taken unanimously** by the Monetary Policy Committee (MPC).
- The **MPC's decision to pause will give relief to borrowers as the external benchmark-based lending rate (EBLR), which is linked to the repo rate, will not increase**.

**External Benchmark Lending Rate (EBLR)**

- After the introduction of MCLR, RBI was skeptical about the implementation of MCLR by banks. Hence, RBI set up a committee which is known as Janak Raj Committee.
- Shifting of loans from BRR to MCLR was not done by all Banks. There are certain loans which are still under BRR regime and banks are enjoying the higher profit.
- MCLR rate used to be recalculated frequently. However, many banks used to revise MCLR only either once in 6 months or 12 months.
- Assumed that RBI reduced its rate on Jan 2019 and banks following the revision of MCLR on a yearly basis, then Banks may revise their MCLR in December 2019. The reduction in MCLR in Jan 2019 will not be going to affect to the borrower immediately. Hence, **there is a big lagging in policy implementation effectively**.
- The **Committee recommended shifting to external benchmark lending rate rather than banks internally decide their benchmark.**
- This is where the **RBI acted now and introduced all loans be under external benchmark lending rate effective from 1st October 2019.**

**How does the new system work?**

- The new system came into effect from April 1, 2019.
- Banks will then have to link their lending rates charged on different categories of loans with an external benchmark instead of MCLR.
- The RBI has given the following options to banks:
  - RBI repo rate
  - the 91-day T-bill yield
  - the 182-day T-bill yield
  - any other benchmark market interest rate produced by the Financial Benchmarks India Pvt. Ltd
- **One of these benchmarks will be used to decide the lending rate in addition to the spread.**
- **Banks will be free to decide their spread value** but it will have to be fixed for the tenure of the loan.
- However, it can change if the credit score of the borrower changes.
- The **interest rates under the new system will change every month**.

**How will it benefit borrowers?**

- It will help **better transmission of policy rate cuts** e. an RBI rate cut will immediately reach the borrower.
- It will make **the system more transparent since every borrower will know the fixed interest rate and the spread value** decided by the bank.
- It will help **borrowers compare loans in a better way** from different banks.
- Under the new system, a **bank is required to adopt a uniform external benchmark within a loan category.**

- This will ensure transparency, standardisation and ease of understanding for the borrowers.
- This would mean that same bank cannot adopt multiple benchmarks within a loan category.
  - **Unlike earlier benchmarks – Base Rate and Marginal Cost of funds-based Lending Rate (MCLR) – External Benchmark-linked Lending Rate (EBLR) ensures better transmission of policy rate changes.**
  - In case of a repo rate cut, banks have to pass on the entire benefit to borrowers. Likewise, borrowers will have to bear the entire burden of any repo rate hike. RBI's Monetary Policy Report points to a more effective transmission of policy action under the EBLR regime.
  - Personal loans and other retail loans, as well as loans to small businesses, have floating interest rates based on EBLR. Banks can opt to provide such loans linked to the EBLR to other categories of loans too.
  - Banks have to follow the same external benchmark for a particular loan category. This has been done so that the borrowers can get transparent, standardised, and easy-to-understand loan products.

**Significance**

- The EBLR rate benefits the borrowers and the lending banks in several ways.
- Banks get the freedom to decide the spread over the EBLR.
- Since EBLR is an external rate, a policy rate cut activity regarding the lending rates will reach the loan seekers sooner.
- The interest rate process is more transparent and easier to understand for borrowers.
- Borrowers can analyse the interest rates charged by various banks. This way borrowers know the profit margin of every bank over the fixed rate of interest, which helps compare various loan options.

| Marginal Cost of Lending Rate | Repo-Linked Loan |
| --- | --- |
| Linked to banks' cost of funds | Linked to RBI's lending rate |
| Takes 4-6 months to move after RBI rate cut | Responds immediately to RBI rate cut |
| RBI rate cuts not fully passed on to borrowers | Rate cuts are automatically passed on |
| Resets annually for most banks | Reset every three months |
| Changes by 5-10 bps | Usually changes 25bps or more |
| Revised every month | Reviewed bi-monthly |
| Low volatility | Higher volatility |
| 100bps=1% \| Repo - RBI's lending rate to banks | |

## 10. Canada, Japan, UK, EU question India's quality control orders at WTO

**What is the issue?**

- Canada, Japan, the UK and the European Union have raised concerns at the WTO about the increasing number of quality control orders (QCOs) being issued by India across sectors such as toys, tyres, auto parts, chemicals and petrochemical products, many of which seem "protectionist in nature
- Earlier this week, at a meeting of the WTO Committee on Trade in Goods in Geneva, the four members noted that some of India's QCOs may not be compliant with WTO norms as they appeared to be tools to protect domestic industry
- **The Department of Policy for Investments and Internal** Trade has issued 20 QCOs in the last three years for products such as toys, leather and rubber footwear, safety glass and sewing machines.

## 11. Lens on inflation-targeting

**Context**: Last week, the Reserve Bank of India (RBI) decided to stop raising interest rates. This was unexpected — since May 2022, RBI had consistently raised interest rates, trying to pull runaway inflation down closer to its target 4%level. India's central bank is required by law to target a certain level of inflation. It does this primarily by raising interest rates in the economy. Higher rates slow down economic growth because loans of kinds become costlier. Thus, if any central bank were to focus relentlessly on

targeting the inflation rate, the result could be an overall contraction in **economic growth**— in other words, **a recession**. In the United States, the Federal Reserve has been raising interest rates in a bid to achieve its target of 2% inflation. This is dragging down overall demand and economic activity, and there is a risk that the Fed might push the US economy into recession

**What is runways inflation?**

When inflation is uncontrolled (say in double-digit) and experienced over a long period of time, it gets the dreaded name of runaway inflation

**Flexible inflation targeting regime**

- **Flexible inflation targeting** is adopted when the central bank is to some extent also concerned about other things, for instance, the stability of interest rates, exchange rates, output and employment.
- **In case of India,** the flexible Inflation targeting was introduced through the Monetary Policy Framework Agreement signed between the RBI and Government in 2015.
- The **Reserve Bank of India Act, 1934** was amended to provide a statutory basis for a FTI framework.
- The amended Act provides for the inflation target to be set by the Government, in consultation with the RBI, once every five years.
- As per terms of the agreement, **RBI's primary objective would be to maintain price stability,** while keeping in mind the objective of growth.
    - The RBI is required to maintain a **rate of inflation of 4% with a deviation of 2%** i.e., inflation has to be maintained between 2% to 6%.
- Under the flexible inflation targeting regime, the monetary policy decision making is vested with the **Monetary Policy Committee** but its implementation falls in RBI's domain.
    - The **Monetary Policy Committee (MPC)** constituted by the Central Government under Section 45ZB of RBI Act determines the policy interest rate required to achieve the inflation target.
- When the **Reserve Bank of India fails to meet the inflation target for 3 consecutive quarters,** it will send a report to the central government stating:
    - A breach of the "tolerance level" for three consecutive quarters will constitute a failure of monetary policy
- the reasons for failure to achieve the inflation target;
- remedial actions proposed to be taken by the bank; and
- an estimate of the time period within which the inflation target shall be achieved.
- These would be presented in a report to the **Union Ministry of Finance.**
- It **would be up to the government to make the RBI report public.**
- The special meeting of the MPC will discuss the RBI report before it is submitted.

**Challenges to monetary policy to control inflation**

- **Inflation, mainly cost-push** caused by supply chain disruption-Russia-Ukraine conflict and high crude oil prices are the two immediate factors contributing to upside risks to inflation.
- **Fiscal-monetary conflict**– as tightening monetary policy would increase cost of borrowing for government
- **Crowd out effect of tight monetary policy-** as cost of borrowing would rise leading to decline in private consumption and investment.
- **Output gap is still negative**– as output is below full-capacity production due to COVID pandemic.

**Rational Expectations?**

- Rational expectations is an economic theory that states that **individuals make decisions based on the best available information** in the market and learn from past trends.
- Because people make decisions based on the available information at hand combined with their past experiences, **most of the time their decisions will be correct**. If their decisions are correct, then the same expectations for the future will occur. If their decision was **incorrect, then they will adjust their behavior based on the past mistake**.
- **Increasing information**–would help build expectations of low inflation by increasing credibility of the government and would help tame inflation in future.

**12. DPIIT in talks with IBA to improve banks' outreach to start-ups**

The Department for Promotion of Investments and Internal Trade (DPIIT) is in discussions with the Indian Banks Association (IBA) on ways to get banks to reach out to Indian start-ups to understand their financial requirements and help improve penetration of branches across sectors and cities, said a senior official.

**Concept :**

**About the Startup India Seed Fund Scheme (SISFS):**

- **Aim:** To provide financial assistance to startups for proof of concept, prototype development, product trials, market entry, and commercialization.
- **Launched by: Department for Promotion of Industry and Internal Trade (DPIIT)** with an outlay of Rs. 945 Crore.
- **Some Eligibility Conditions:**
    - A startup, recognized by DPIIT, **incorporated not more than 2 years ago** at the time of application.

- Startups **should not have received more than Rs. 10 lakh of monetary support** under any other Central or State Government scheme.
- **Features:**
    - It will **support an estimated 3,600 entrepreneurs through 300 incubators** in the **next 4 years.**
    - An **Experts Advisory Committee (EAC),** constituted by DPIIT, will be **responsible for the overall execution** and monitoring of the Scheme.
    - **Grants of upto Rs. 5 crore will be provided to the eligible incubators** selected by the committee.
    - The **selected incubators will provide grants of up to Rs. 20 lakh** for validation of proof of concept, or prototype development, or product trials to **startups.**
    - **Investments of up to Rs. 50 lakh will be provided to the startups** for market entry, commercialization, or scaling up through convertible debentures or debt-linked instruments.
- **Expected Benefit:**
    - It will **help in creating a robust startup ecosystem in Tier 2 and 3 regions,** as the smaller towns in India are often not provided with appropriate funding.

**The MAARG Portal**

- It is by Startup India is a one stop mentorship platform to facilitate mentorship for startups across diverse sectors, functions, stages, geographies, and backgrounds.
- Startups can connect with academicians, industry experts, successful founders, seasoned investors, and other experts to get personalized advice on growth strategy, seek clarity, and get practical advice.

**Startup India**

- Startup India was **introduced in 2016 as a call to innovators, entrepreneurs, and thinkers** of the nation to lead from the front in driving India's sustainable growth and create large scale employment opportunities.
- The entrepreneurial portal had more than 65,000 startups registered.
- Of which, **100 attained the 'unicorn' status recently**, bringing the total as of date to 90.
- India is **ranked third among global** startup ecosystems.
- India's largest online entrepreneurship platform allows startups to network, access free tools & resources and participate in programs & challenges.

**About IBA**

- It is a representative body of management of banking in India operating in India or an association of Indian banks and financial institutions based in Mumbai.
- It was formed in 1946 for development, coordination and strengthening of Indian banking, and assist the member banks in various ways including implementation of new systems and adoption of standards among the members
- Public Sector Banks, Private Sector Banks, Foreign Banks having offices in India, Co-operative Banks, Regional Rural Banks and All India Financial Institution are its member.
- IBA currently represents 237 banking companies operating in India.

**13. IPO pricing**

- The Securities and Exchange Board of India (SEBI) on Tuesday asked stock exchanges to set a "common equilibrium price" for stocks on the first day of the listing post the IPO in order to remove any ambiguity over price discovery.
- Currently, the price discovery for shares happens through a call auction process.
- Call auction session would continue to be conducted separately on individual exchanges and orders would be matched by respective exchanges after computation of equilibrium price
- CEP will be a volume-weighted average of equilibrium prices on individual exchanges as determined by the call auction. The exchanges will set the aforesaid CEP in their trading systems and apply uniform price bands based on the CEP. Further, only unexecuted pending orders from call auction sessions within the price band will be carried forward to the normal market segment. The provisions of this circular will come into effect after 60 days from the date of issuance.

**Why change?**
SEBI has asked exchanges to put in place systems for implementation of the circular, including necessary amendments to the relevant bye-laws, rules, and regulations. SEBI has also asked stock exchanges to communicate the status of the implementation of the provisions of this circular in the monthly development report.
The call auction mechanism for IPOs was started by SEBI in January 2012. According to SEBI, since call auction sessions are conducted on multiple stock exchanges, the discovered price or equilibrium price pursuant to such call auction sessions could be different on each exchange.

**IPO**

- IPO is the **selling of securities to the public in the primary market.**
- **Primary market** deals with **new securities being issued for the first time.** It is also known as the new issues market.
- It is different from secondary market where existing securities are bought and sold. It is also known as the stock market or stock exchange.

- It is when an unlisted company makes **either a fresh issue of securities or an offer for sale of its existing securities** or both for the first time to the public.
- It is generally used by new and medium-sized firms that are **looking for funds to grow** and expand their business.

## 14. Govt. unveils Quality Control Orders for technical textiles

**Concept:**

- The Ministry of Textiles has announced two **Quality Control Orders (QCOs) for 31 technical textile items** which include 19 geo textile and 12 protective textile products.
- The latest QCO is the first-ever technical regulation for technical textile products in the country.
- In the next phase, the Ministry of Textiles is looking to issue two more QCOs for 28 items that aim to cover 22 agro textile products and six medical textile items.
- Recently Quality Control Orders (QCO) were introduced for fibres such as cotton, polyester and viscose which are the basic raw materials in the Indian textile industry.

**Quality Control Orders (QCOs)**

- For ensuring the availability of quality products to consumers, **Quality Control Orders (QCOs) are issued by various Ministries/Departments of the Government of India** in the exercise of the powers conferred by section **16 of the Bureau of Indian Standards Act**, 2016 stipulating conformity of the products to Indian Standards.
- The **main aim of the QCO is to control the import of sub-quality and cheaper items and to ensure that customers get quality products**.
- QCOs **can only be challenged at WTO** if they are **imposed on grounds of health, safety, environment and deceptive trade practice, or national security**.
- BIS certifies it for International and domestic products.

**India's stand:**

- All orders are in line with WTO norms
- India has the right to impose QCOs since they are first applied in the domestic market and then on imports.
- India's rationale behind issuing QCOs is to curb the dumping of cheap products from China and to address the widening trade deficit, which is nearly 40% of the total deficit.

**Technical Textiles**

- **Technical textiles** are functional **fabrics that have applications across various industries** including automobiles, civil engineering and construction, agriculture, healthcare, industrial safety, personal protection etc.
- Technical Textile products derive their demand from development and industrialization in a country.
- Based on usage, **there are 12 technical textile segments**: Agrotech, Meditech, Buildtech, Mobiltech, Clothtech, Oekotech, Geotech, Packtech, Hometech, Protech, Indutech and Sportech.
- For example, 'mobiltech' refers to products in vehicles such as seat belts and airbags, airplane seats; geotech, which is incidentally the fastest growing sub-segment, used to hold back soil, etc.

## 15. Dabba Trading

**Concept :**

- The National Stock Exchange (NSE) issued a string of notices naming entities involved in 'dabba trading'.

**What is 'dabba trading'?**

- Dabba (box) trading refers to **informal trading that takes place outside the purview of the stock exchanges.**
- **Traders bet on stock price movements without incurring a real transaction** to take physical ownership of a particular stock as is done in an exchange.
- It is **gambling centred around stock price movements**.
- 'Dabba trading' is recognised as an **offence under Section 23(1) of the Securities Contracts (Regulation) Act (SCRA), 1956** and **upon conviction, can invite imprisonment for a term extending up to 10 years** or a **fine up to ₹25 crore, or both**.

**Aim and purpose:**

- The primary purpose of such trades is to **stay outside the purview of the regulatory mechanism.**
- Transactions are **facilitated using cash** and the mechanism is operated using unrecognised software terminals.
- It could also be **facilitated using informal or kaccha (rough) records**, sauda (transaction) books, challans, DD receipts, cash receipts alongside bills/contract notes as proof of trading.

**Challenges:**

- **Tax evasion:**
  - Since there are no proper records of income or gain, it helps dabba traders escape taxation.

- They would not have to pay the Commodity Transaction Tax (CTT) or the Securities Transaction Tax (STT) on their transactions.
- The use of cash also means that they are outside the purview of the formal banking system.
- All of it combined results in a loss to the government exchequer.
- **Associated risks:**
  - In 'dabba trading', the primary risk entails the possibility that the broker defaults in paying the investor or the entity becomes insolvent or bankrupt.
  - Being outside the regulatory purview implies that investors are without formal provisions for investor protection, dispute resolution mechanisms and grievance redressal mechanisms that are available within an exchange.
- **Menace of black money**:
  - Since all activities are facilitated using cash, and without any auditable records, it could potentially encourage the growth of 'black money' alongside perpetuating a parallel economy.
  - This could potentially translate to risks entailing money laundering and criminal activities.
- **Harassment:**
  - On entering the dabba ecosystem, the clients were harassed by the broker's 'recovery agents' for default payments and refused payments upon profit.

## 16. Consensus on definition of startups among G20 nations may emerge by July

**Context**: G20 nations are working towards agreeing on a common definition for start-ups by July this year to help create an ecosystem that will enable global policymaking, say officials.

A G20 Startup20 Engagement Group was formed recently to come up with policy recommendations on entrepreneurship and innovation priorities of G20 countries. The taskforce on foundation and alliances, one of the three taskforces, has been tasked to come up with consensus-based definitions and promote knowledge sharing.

According to the Department for Promotion of Industry and Internal Trade (DPIIT), the nodal department for start-ups in India, an entity would be considered a start-up up to 10 years from its date of incorporation and if its turnover for any of the financial years since incorporation does not exceed ₹100 crore.

**Why definition of Start up is important?**

Definition of start-ups is important as governments extend various incentives, including tax sops to such entities by meeting the stated requirements and parameters. The G20 Starup20 Engagement Group also seeks to bridge the knowledge gap between the start-up ecosystems of G20 member countries and emerging economies through partnerships with enablers such as incubators and government agencies, per a government statement.

The finance taskforce aims to increase access to capital for start-ups by providing financing and investment platforms and also create pitching and networking opportunities. The inclusion and sustainability taskforce is working on the roadmap to increasing support for women-led start-ups and organisations. It also plans to promote start-ups working on making communities more inclusive and those working on sustainable development goals in areas of global interest.

**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".

## 17. Passive funds' AUM grows 34% in FY23 nears ₹7 lakh crore

Passive investing refers to a strategy adopted by investors to optimize their returns by buying and holding a broad base of securities rather than churning portfolios by buying and selling them frequently.

The main aim is not to beat the market but to track portfolio performances and provide returns equal to that of the prominent stock exchanges of the country. This is usually done by investing in a low-cost, broadly diversified index fund.

Index funds, Exchange-Traded Funds (ETFs), and Direct Equity are the three types of passive investing.

Due to its simplicity of having to buy and hold a broad-based index of securities, passive investing tends to gain prominence among the masses.

**Khayal**

- The word khayal, derived from Persian, means "imagination" Origin of this style was attributed to Amir Khusrau.
- Is popular amongst the artists as this provides greater scope for improvisation.
- Based on the repertoire of short songs ranging from two to eight lines. Is also referred to as a 'Bandish'.
- Khayal is also composed in a particular raga and tala and has a brief text.
- Texts mainly include Praise of kings, Description of seasons, Pranks of Lord Krishna, Divine love & Sorrow of separation
- **Major gharanas in khayal:** Gwalior, Kirana, Patiala, Agra, and Bhendibazaar Gharana

- Gwalior Gharana is the oldest and is also considered the mother of all other gharanas.

**Historical evolution**

- The early form of khayal emerged in the late 16th century when Sufi musicians based in the region between Delhi and Jaunpur adapted the *cutkula* form, which used a Hindi dialect, to devotional forms such as the Persian *qaul* and *tarana* sung in Sufi communities from Amir Khusro's (1253-1325) tradition, according to Katherine Butler Schofield, the foremost historian of khayal. Khusro, a musician, poet and scholar, lived during the rule of the Delhi Sultanate. The *cutkula* was a regional form that was in vogue during the reign of Sultan Hussain Shah Sharqi of Jaunpur, who ruled from 1458 to 1505 and was a great music lover.
- The earliest version of khayal probably evolved into today's *drutbandish*, the fast composition, also called the chhota khayal, which is meant to be sung in a spritely tempo, some experts say. The Sufi communities that were the crucible in which this emerged attracted both Hindus and Muslims, and its leading members had close relationships with Vaishnava sects, Butler Schofield says. In the early 17th century, khayal travelled from the Sufi communities to the qawwals of Hazrat Nizamuddin Dargah in Delhi, remaining within their lineage until the early 18th century, she further says.
- In the next phase, many experts agree that Niyamat Khan "Sadarang" (1670-1748), a famous dhrupad singer and been player at the court of the Mughal emperor Muhammad Shah "Rangila", who ruled from 1714 to 1748, played a key role in further developing khayal. In particular, he began creating khayal compositions with some melodic movements from dhrupad, setting many of these compositions in a slow tempo. This version became the vilambitbandish, or slow composition, also called the bada khayal, which is now the centrepiece of a raga rendition in khayal. Sadarang was a kalawant, the term used for a singer from a hereditary lineage of musicians attached to a Mughal court. Both his slow and fast compositions are widely sung to this day.
- Today, the majority of khayal's practitioners are Hindu, but in previous generations, a mix of Hindu and Muslim singers coexisted, while in its early phase, the genre emerged in a Sufi Islamic context.

**18. Private Equity and Venture Capital Funds' Investments Decline 4% To $5.3 Billion In March**

**Concept** –

- Venture capital and private equity are two **types of financial assistance that are used by companies** in different stages.
- **Private Equity is a large investment in developed companies** and **venture capital is a small investment usually made in initial stages of development of a company**.
- Private equity funds refer to **investments made by investors for investment purposes**.
- Whereas, venture capital refers to **funding to those ventures that are backed by new entrepreneurs, have high risks**, and who require money to shape their ideas.

Venture Capital

- Venture capital is referred to **funds invested by individuals or investors to start-ups** or small companies aspiring to establish a fresh concept and new entrepreneur. All those new private companies who cannot raise their funds from the public sector may raise funds from the venture capital.
- This type of investment indicates **high risk** but is supported by fresh and top qualified entrepreneurs. Venture Capital firms assist developing businesses in their initial stages before making it public.
- It is a popular funding process and sometimes required to raise money for bank loans, capital markets, or other debt instruments. This type of investor is known as a Venture Capitalist, and the capital they provide is called equity capital.

Private Equity

- Private equity can be defined as the **capital investment**, which is made by companies or investors in the private firms that are **not a part of the stock exchange**. These fund investments are **made by the high-net-worth firms or individuals**. These investors acquire private companies shares or earn authority of public companies to take them private and de-list from public stock exchanges.
- Private Equity firms purchase an existing company and help them to develop and expand.
- This entity has become an essential part of the financial services and is one of the attractive funding options.

**19. March wholesale price rise slows to 1.34% on base effect**

**Context:** Wholesale price index-based inflation fell to a 29-month low of 1.34 per cent in March due to moderation in prices of manufactured products, commodity prices and a favourable base effect, data released by the Ministry of Commerce and Industry on Monday showed.

Even though some food items showed an increase in inflation, this was the 10th straight month when wholesale inflation recorded a moderation. WPI inflation was recorded at 3.85 per cent in the previous month and 14.63 per cent in March 2022. For FY23, the wholesale inflation averaged 9.4 per cent, moderating from a 30-year high of 13 per cent in FY22.

**Concept:**

**WPI**

- It is the **most widely used inflation indicator** in India.
- It is published by the **Office of Economic Adviser, Ministry of Commerce and Industry.**

- All transactions at the first point of bulk sale in the domestic market are included.
- Major criticism for this index is that the general public does not buy products at wholesale price.
- The base year of All-India WPI has been revised from 2004-05 to **2011-12** in 2017.
- WPI includes three components viz,
  - Manufactured products – 64.2%
  - Primary articles – 22.6%
  - Fuel and power – 13.1%

## CPI vs. WPI

- WPI, tracks inflation at the producer level and CPI captures changes in prices levels at the consumer level.
- WPI does not capture changes in the prices of services, which CPI does.

## Disinflation

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

## Deflation

- Deflation is a decrease in general price levels throughout an economy.
- Deflation, which is the opposite of inflation, is mainly caused by shifts in supply and demand.
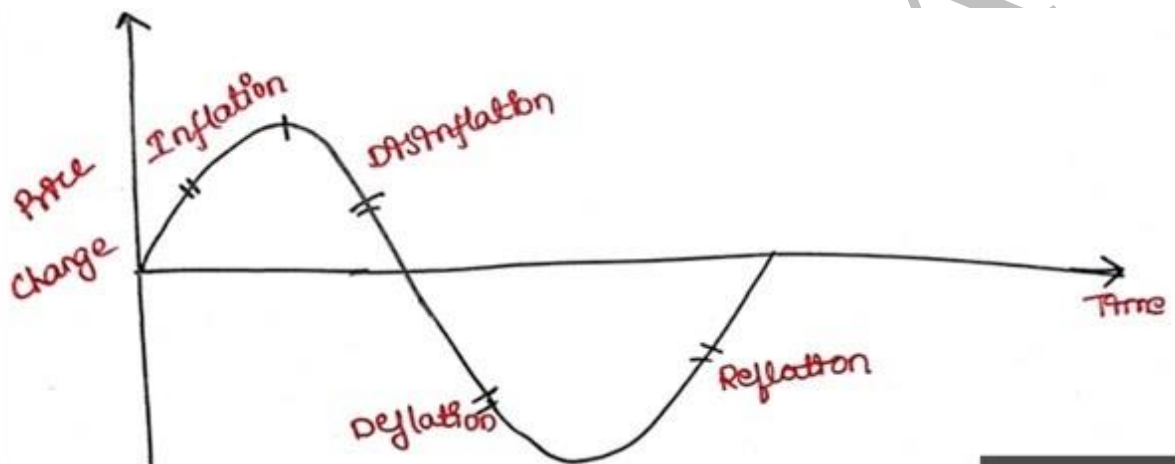


## Imported Inflation

- When the general price level rises in a country because of the rise in prices of imported commodities, inflation is termed as imported.
- Two key contributors to India's imports are: Crude Oil and Gold. Rise in prices of these two products lead to rise in the import bill of the country.
  - Fuel and power has 14.91% weightage in the Wholesale Price Index in India.
- However, inflation may also rise due to the depreciation of the domestic currency, which pushes up the rupee cost of imported items.

## Structural inflation

- Structural inflation is the one prevailing in most developing countries.
- The situation is due to the operation of the structural weakness (supply bottleneck, lack of infrastructure, etc.) existing in a developing economy.
- Lack of adequate supply responses or production to increase in demand is the cause of structural inflation.
- The Structuralist argues that the economies of developing countries like, Latin America and India are structurally underdeveloped as well as highly volatile due to the existence of weak institutions and imperfect working of markets.
- Such economies face the problem of both shortages of supply, under utilisation of resources as well as excessive demand in some sectors.
- For example
  - Under developed transportation sector will increase logistic cost and will result in overall increase in prices of commodities
  - Similarly, structural bottlenecks in agricultural sector such as APMCs, involvement of middlemen, imperfect price discovery leads to rise in food prices
  - Resource constraints (such as government Budget constrain) to finance infrastructure development.

## 20. Centre for Processing Accelerated Corporate Exit (C-PACE)

**Context:**

- Centre for Processing Accelerated Corporate Exit (C-PACE), an **initiative of the Central Government** to accelerate the **process for voluntary winding up of companies,** will go live from May 1.

**More about C-PACE:**

- C-PACE or **Centre for Processing Accelerated Corporate Exit** is a newly **established body** that **aims to process and dispose of applications** for the removal of company names from the records under the **Companies Act, 2013.**
- C-PACE will be located at the **Indian Institute of Corporate Affairs (IICA) in Manesar, Haryana**, as a **one-stop solution for companies looking to close their business** and remove their names from the Register of Companies.
- The **primary purpose of C-PACE** is to facilitate the **process of closing businesses and removing company names from the Register of Companies** from the **currently required 2 years to less than 6 months.**
- Companies **looking to file applications for the removal** of names from the Register of Companies under **Section 248 of the Companies Act, 2013**, can benefit from C-PACE.
- **The Registrar of C-PACE** has now been **designated as the Registrar of Companies (RoCs)** for the **purpose of exercising functional jurisdiction of processing and disposal of applications for voluntary winding up of companies.**
- The **Registrar of C-PACE** will have **territorial jurisdiction all over India** to consider processing and disposal of applications for removal of names of companies from the Register of Companies in case of voluntary winding up.
- MCA has also specified the format of **three new forms (STK-2, STK-6 and STK-7) related to voluntary winding up of companies.**

**21. RBI refuses exceptions on CRR, SLR; gives some leeway on PSL, investments for merger: HDFC Bank**

**Context**:

- HDFC Bank said the Reserve Bank has refused to make any exceptions on **cash reserve ratio (CRR) and statutory liquidity ratio (SLR)** requirements as sought by it ahead of the merger of mortgage financier parent HDFC with itself. The central bank has, however, allowed some leeways on the priority sector lending front, the city-headquartered bank said in a letter to the exchanges.
- HDFC Bank and HDFC announced a USD 40 billion merger, the largest in Indian corporate history, last April and are awaiting the final regulatory go-ahead for the same. In pursuit of the same scheme, HDFC Bank sought relaxations on certain regulatory requirements from the regulator.The bank informed the exchanges that it has received a letter from RBI with views on certain matters, while clarity on other requests is expected in due course.

**CRR**

- It is a certain **minimum amount of deposit** that the **commercial banks** have to hold as reserves with the **central bank.**
- The **percentage of cash required to be kept in reserves, vis-a-vis a bank's total deposits,** is called the Cash Reserve Ratio.
- The cash reserve is either stored in the bank's vault or is sent to the RBI. Banks do not get any interest on the money that is with the RBI under the CRR requirements.

**Primary purposes of the Cash Reserve Ratio**

- Since a part of the bank's deposits is with the Reserve Bank of India, it ensures the security of the amount. It makes it readily available when customers want their deposits back.
- Also, CRR helps in keeping inflation under control.
- At the time of high inflation in the economy, RBI increases the CRR, so that banks need to keep more money in reserves so that they have less money to lend further.

Basel-III created two liquidity ratios: LCR and NSFR.

- **The liquidity coverage ratio (LCR)** will require banks to hold a buffer of high-quality liquid assets sufficient to deal with the cash outflows encountered in an acute short term stress scenario as specified by supervisors. The goal is to ensure that banks have enough liquidity for a 30-days stress scenario if it were to happen.
- The **Net Stable Funds Rate (NSFR)** requires banks to maintain a stable funding profile in relation to their off-balance-sheet assets and activities. NSFR requires banks to fund their activities with stable sources of finance (reliable over the one-year horizon). The minimum NSFR requirement is 100%.

**Statutory Liquidity Ratio:**

- **Statutory Liquidity Ratio popularly called SLR** is the minimum percentage of deposits that the commercial bank maintains **through gold, cash and other securities.**
- These deposits are maintained by the banks themselves and not with the RBI or Reserve Bank of India unlike the Cash Reserve Ratio.
  - Banks earn returns on money parked as SLR
- **Section 24 and Section 56 of the Banking Regulation Act 1949** mandates all scheduled commercial banks, local area banks, Primary (Urban) co-operative banks (UCBs), state co-operative banks and central co-operative banks in India to maintain the SLR.

- It comprises of– **cash, gold and SLR securities,** comprising central and state government securities:
  - Dated securities
  - Treasury Bills of the Government of India;
  - Dated securities of the Government of India issued from time to time under the market borrowing programme and the Market Stabilization Scheme;
  - State Development Loans (SDLs) of the State Governments issued from time to time under the market borrowing programme; and
  - Any other instrument as may be notified by the Reserve Bank of India

**The liquidity coverage ratio (LCR)**

- It refers to the **proportion of highly liquid assets held by financial institutions, to ensure their ongoing ability to meet short-term obligation**s.
- The LCR was introduced as part of the **Basel III reforms** following the 2008 global financial crisis and was finalised by the Basel Committee on Banking Supervision in January 2013.
- **LCR = High-Quality Liquid Asset Amount (HQLA) / Total Net Cash Flow Amount**

**Priority sector lending**

- Priority sector lending refers to **those sectors or areas of the economy which may not get timely and adequate credit.**
- The RBI requires Indian banks **to allocate certain portion of their overall lending for sectors mentioned under PSL.** These areas of focus for PSL include Agriculture, Micro, Small and Medium Enterprises (MSME), Export Credit, Education, Housing, Social Infrastructure, Renewable Energy.
- Reserve Bank of India has, from time to time, issued a number of guidelines to banks on Priority Sector Lending. These were last reviewed in April 2015 and for urban and cooperative banks in May 2018.
- PSL guidelines are **applicable to all domestic scheduled commercial banks (excluding Regional Rural Banks and Small Finance Banks) and foreign banks with 20 branches and above**.

**22. EU's new crypto-legislation**

**Concept :**

- The European Parliament, the legislative body of the 27-country block European Union, has approved the **world's first set of comprehensive rules to bring largely unregulated cryptocurrency markets under the ambit of regulation by government authorities.**

**About the new legislation**

- The regulation is called the **Markets in Crypto Assets (MiCA**). Mica is the most comprehensive regulatory framework for digital assets to date.
- The rules will impose a number of requirements on crypto platforms, token issuers and traders around transparency, disclosure, authorization, and supervision of transactions.
- Platforms will be required to inform consumers about the risks associated with their operations, while sales of new tokens will also come under regulation.

**Coverage:**

- The MiCA legislation will apply to 'cryptoassets' (Bitcoin, Ethereum and stablecoins)
- Cryptoassets can be understood as a digital representation of a value or a right that uses cryptography for security and is in the form of a coin or a token or any other digital medium which may be transferred and stored electronically, using distributed ledger technology or similar technology
- **Stablecoins:**
- It will **apply not only to traditional cryptocurrencies like Bitcoin and Ethereum** but also to **newer ones like stablecoins**. MiCA will establish new rules for three types of stablecoins-
- asset-referenced tokens, which are linked to multiple currencies, commodities or cryptocurrencies
- e-money Tokens, which are linked to a single currency
- utility tokens are intended to provide access to a good or service that will be supplied by the issuer of that token
- **Stablecoins** are digital tokens that aim to stay pegged in value with a more stable asset — a fiat currency like the U.S. dollar or other stable cryptocurrencies.

**Out of Coverage**

- **MiCA's scope will not regulate digital assets that would qualify as transferable securitie**s and function like **shares or their equivalent** and **other crypto assets that already qualify as financial instruments under existing regulation.**
- It will also, for the most part, **exclude nonfungible tokens (NFTs).**
- MiCA will **also not regulate central bank digital currencies** issued by the European Central Bank and digital assets issued by national central banks of EU member countries when acting in their capacity as monetary authorities, along with crypto assets-related services offered by them.

**Regulation of cryptocurrency in India**

- India is **yet to have a comprehensive regulatory framework for crypto assets**. Draft legislation on the same is reportedly in the works.
- However, the Indian government has taken certain steps to bring cryptocurrencies under the ambit of specific authorities and taxation.
- In Budget 2022, the Finance Ministry said that cryptocurrency trading in India has seen a "phenomenal increase" and imposed a 30% tax on income from the "transfer of any virtual digital asset."
- In March 2023, the **government placed all transactions involving virtual digital assets under the purview of the Prevention of Money Laundering Act (PMLA).**

## 23. India reliance on imported crude oil at record high of 87.3% in FY23

- Rising demand for fuel and other petroleum products amid **flagging domestic crude** oil output has resulted in India's reliance on imported crude increasing to a record 87.3 per cent of domestic consumption in 2022-23, up from 85.5 per cent in 2021-22, according to data released by the oil ministry's **Petroleum Planning & Analysis Cell (PPAC).**
- India's oil import dependency was **4 per cent in 2020-21, 85 per cent in 2019-20**, and **83.8 per cent in 2018-19.**
- The computation of the extent of import reliance is based on the domestic consumption of petroleum products and excludes petroleum product exports as those volumes don't represent India's demand. With refining capacity of a little over **250 million tonnes per annum**, India — the **world's third-largest consumer** of crude oil and also **one of its top importers** – is a **net exporter of petroleum products.**
- India's domestic consumption of petroleum products in **2022-23 rose over 10 per cent** year-on-year to a record **3 million tonnes**, underscoring robust demand, particularly for transportation fuels (petrol and diesel). However, domestic crude oil production for the year **declined 1.7 per cent to 29.2 million tonnes**. Crude oil **imports in 2022-23 rose 9.4 per centyear-on-year to 232.4 million tonnes.** In value terms, crude oil imports for the fiscal were at **$158.3 billion, up from $120.7 billion in 2021-22,** as per PPAC data.
- Total production of petroleum products from domestic crude oil was **2 million tonnes** in **2022-23,** which means that the extent of India's self-sufficiency in crude oil was just **12.7 per cent, down from 14.5 per cent in 2021-22. In 2021-22**, consumption of petroleum products sourced from indigenous crude oil was **29.3 million tonnes,** while total domestic consumption was **201.7 million tonnes.**
- While the government wants to reduce India's increasing reliance on imported crude oil, sluggish domestic oil output in the face of growing demand for petroleum products has been the biggest roadblock. Cutting costly oil imports is also a fundamental objective of the government's push for electric mobility, biofuels, and other alternative fuels for transportation as well as industries. Over the past few years, the government has intensified efforts to raise domestic crude oil output by making exploration and production contracts more lucrative and opening vast acreages for oil and gas exploration

## CRUDE CONSUMPTION
### (Based on domestic use)

| Financial year | Share of imports (%) | Domestic oil share (%) |
|---|---|---|
| 2018-19 | 83.8 | 16.2 |
| 2019-20 | 85 | 15 |
| 2020-21 | 84.4 | 15.6 |
| 2021-22 | 85.5 | 14.5 |
| 2022-23 | 87.3 | 12.7 |

**Challenge of High reliance on imported crude oil**

- It makes the Indian economy vulnerable to **global oil price volatility,** apart from having a bearing on the **country's foreign trade deficit, foreign exchange reserves**, **rupee's exchange rate**, and **inflation**

## 24. Hydrogen to massively greenify steelmaking

**Context:** If iron oxide can be heated with hydrogen instead of coke, to remove oxygen, the sector's carbon emissions could nosedive.

### Background:

- **Hydrogen** is a crucial part of **the world's plans to greenify its manufacturing and automobile industries** as a fuel whose production and use needn't emit carbon. But in the **steelmaking industry**, **hydrogen can also be used instead of carbon** in an important chemical reaction **that contributes to 5-7% of the global greenhouse-gas emissions and 11% of carbon dioxide emissions**. That is, if scientists can surmount an old roadblock.
- Researchers in Germany have reported that they may have figured out why **using hydrogen as a reactant in a reaction with iron oxide proceeds more slowly than expected**, a fact that currently renders the element infeasible as a substitute for carbon.

### What is the new study's context?

- India is the **world's second-largest steelmaker**, having produced 118.2 million tonnes in 2021. **Making one tonne of steel releases 1.8 tonnes of carbon dioxide**, making the sector's decarbonisation plans an integral part of the country's ability to achieve its climate commitments.
- **Strong steel** consists of a tiny amount – less than 1% – of carbon. To achieve this mix, **iron oxide is heated with coke** (a form of coal with high carbon content) **at 1,700 C inside a blast furnace**. The **carbon reacts with oxygen to form carbon dioxide**, leaving iron with around 4% carbon behind. This iron is **remelted** and oxygen is blown through it, **producing more carbon dioxide** and reducing the amount of carbon in the iron to a desirable level.
- The **blast furnace ironmaking process** is the predominant primary metal production process, with the carbon emissions accounting for approximately 90% of the total value of the entire steelmaking route," a paper published in December 2021 said.

### What is the barrier?

- In the first step, **when oxygen leaves the iron oxide,** scientists know that **it leaves behind minuscule pores in the iron.**
- The German team used phase-field models – a mathematical technique that uses partial differential equations to simulate reactions at interfaces – and electron microscopy to find that **when hydrogen is the reactant, the departing oxygen combines with it to form water that becomes trapped inside these pores**. From here, the **water reoxidises** the **iron and considerably slows the oxygen-removal process**.
- The researchers suggested a solution. Some pores on the iron oxide surface were connected by narrow channels, and they found that the water content in these channels was "almost always" lower than in the pores.
- They hypothesised that the **trapped water drained through these channels**, allowing hydrogen to replace it and continue the oxygen-removal reaction.

### How can the barrier be overcome?

- To encourage such channels to be created when the iron oxide is processed, they **proposed that a "microfracture structure"** should be **created on the feedstock to "increase reduction kinetics and improve metallisation,"** per their paper.
- Creating channels can be achieved by adjusting reduction pressure, temperature, gas composition, and chemical composition or by introducing mechanical deformation to the oxides. This aspect of the research is currently being investigated.
- Currently, multiple hydrogen-based steelmaking technologies are under development. A promising one is shaft furnace hydrogen direct reduction, which uses clean hydrogen as the oxygen-removal agent. With some fine-tuning, it is expected to be able to reduce carbon dioxide emissions by up to 91%.

# ENVIRONMENT

## 1. The first International Day of Zero Waste

**Context:** The world marked the first-ever International Day of Zero Waste on March 30, 2023, encouraging everyone to prevent and minimize waste and promoting a societal shift towards a circular economy.

### Background:

- On 14 December 2022, the **United Nations General Assembly adopted a resolution** at its seventy-seventh session to **proclaim 30 March as International Day of Zero Waste**, to be observed annually.
- Turkey, with 105 other countries, put forward the resolution. It follows other resolutions focused on waste, including "**End plastic pollution: towards an internationally legally binding instrument**", adopted at the United Nations Environment Assembly on 2 March 2022.
- During International Day of Zero Waste, Member States, organizations of the United Nations system, civil society, the private sector, academia, youth and other stakeholders are **invited to engage in activities aimed at raising awareness of national, subnational, regional and local zero-waste initiatives** and their contribution to achieving sustainable development.
- The **United Nations Environment Programme (UNEP) and the United Nations Human Settlements Programme (UN-Habitat**) jointly facilitate the observance of International Day of Zero Waste.
- Promoting zero-waste initiatives through this international day can **help advance all the goals and targets in the 2030 Agenda for Sustainable Development**, including Sustainable Development Goal **11** and Sustainable Development Goal 12. These goals address all forms of waste, including food loss and waste, natural resource extraction and electronic waste.

### International Day of Zero Waste

- International Day of Zero Waste aims to p**romote sustainable consumption and production patterns**, support the **societal shift towards circularity** and raise awareness about how zero-waste initiatives contribute to the advancement of the 2030 Agenda for Sustainable Development.
- The waste sector contributes significantly to the t**riple planetary crisis of climate change, biodiversity and nature loss, and pollution**.
- Humanity generates an estimated **24 billion tons of municipal solid waste annually**, of which **only 55 per cent is managed in controlled facilities**. Every year, around 931 million tons of food is lost or wasted and up to 14 million tons of plastic waste enters aquatic ecosystems.
- Zero-waste initiatives can foster sound waste management and minimize and prevent waste, **helping to address the triple planetary crisis, protect the environment, enhance food security and improve human health** and well-being.

### Adopting zero waste

- A zero-waste approach entails **responsible production, consumption and disposal of products in a closed, circular system.** This means that **resources are reused or recovered** as much as possible and that we minimize the pollution to air, land or water.
- Achieving zero waste requires action at all levels.
- Products should **be designed to be durable and require fewer and low-impact materials**. By opting for **less resource-intensive production** and transport methods, manufacturers can further limit pollution and waste. Advertising and closely managing demand can further enable zero waste throughout products' life cycles.
- **Consumers can also play a pivotal role** in enabling zero waste by **changing habits and reusing and repairing products** as much as possible before properly disposing of them.
- With governments, communities, industries and other stakeholders increasingly recognizing the potential of zero-waste initiatives, bolstering waste management and improving recovery systems through finance and policymaking. The Glo**bal Strategy for Sustainable Consumption and Production can guide this transition.**

## 2. Past warm and cold spells in the Arctic influenced India's monsoon

**Context:** Warm and cold climatic spells in the Arctic, over the past 1000 years, imprinted on India's monsoon fluctuations during that period, a climate reconstruction study finds.

### More on the News:

- Scientists have reconstructed the past 1000 years of climate history from the Arctic, a region that's warming faster than any other place on the planet.
- They've detected warm and cold climatic spells in the Arctic over the past 1000 years. Warm Arctic conditions were **linked to intense rainfall over the Indian subcontinent** while **cold conditions in the Arctic were associated with weak spells of rain** over the Indian subcontinent over the past 1000 years, say scientists at India's National Centre for Polar and Ocean Research (NCPOR).
- Arctic's influence on the short-term changes in the Indian monsoon may become more pronounced as the region experiences further human-driven warming.

- It is anticipated that the **monsoon will intensifyalongside further Arctic warming**, and the difference in precipitation between intense and weak monsoon years will also likely change.
- **Warm/cold Arctic spells** most likely **modified the temperature profile of the Tibetan Plateau**. The **Plateau is an elevated heat source** to the atmosphere because of its height and can **influence monsoons by influencing the prevailing North-South temperature difference** that exists in many forms during the monsoon- such as the land-sea temperature contrast.
- When the Arctic experiences a period of warming, it can **cause a shift in the jet stream**, which is a **fast-moving, high-altitude wind that circles the Northern Hemisphere**. This shift can then **affect weather patterns** in regions far away from the Arctic, such as the Indian subcontinent.

## National Centre for Polar and Ocean Research

- National Centre for Polar and Ocean Research (NCPOR) is an **autonomous research** institution of the **Ministry of Earth Sciences,** Government of India.
- It was **established in 1998** and is located in Vasco da Gama, Goa.
- The primary objective of NCPOR is to **conduct research in the polar and oceanic regions**, with a focus on understanding the role of these regions in the global climate system. The institution carries out research in areas such as atmospheric science, oceanography, glaciology, geology, and marine biology.
- Some of the specific research activities carried out by NCPOR include:
  - Studying **the impact of climate change on the polar regions** and the oceans, and how this impacts global climate systems.
  - Investigating **the role of oceanic currents and circulation patterns** in global climate systems.
  - **Studying the dynamics of glaciers and ice sheets**, and how they are responding to climate change.
  - Conducting **research on marine biodiversity**, and how it is being impacted by climate change and other anthropogenic activities.
- In addition to research activities, NCPOR also **undertakes various outreach and educational activities to promote awareness** about polar and oceanic science among the general public and stakeholders.
- NCPOR is also responsible for **coordinating India's polar research activities**, and has established research stations in Antarctica and the Arctic. The **institution collaborates with several national and international organizations in conducting research** and promoting scientific cooperation in the polar and oceanic regions.

## 3. Global South needs to come together for a better just transition deal

**Context:** South Africa was the first country that signed a Just Energy Transition Partnership (JETP) with G7 countries in 2021 for $8.5 billion.
**More on the News:**

- Though the **Government of India denies the need for a uniform policy** on a just transition away from coal, the **push for such a policy, from experts, is getting stronger**.
- Recently, a Delhi-based think tank, **iForest**, released two reports – **one proposed a just transition framework**, including polices, plans and institutional mechanisms, **while the other estimated that India needs $900 billion over the next 30 years for a just energy transition**. Both the reports **emphasised the need for international cooperation** for a just transition in the Global South. The reports state that countries such as India n**eed grants and concessional financing to support the economic diversification** of fossil fuel regions, green energy, and industrial development and to build the resilience of the impacted communities.
- Meanwhile, there is also an **increasing recognition among the global community of the importance of just transition finance,** which is reflected in collaborations between developed countries (G7) and developing countries.
- From the Global South countries, only South Africa has developed a comprehensive just transition framework so far.

Just Energy Transition Partnership https://optimizeias.com/about-just-energy-transition-partnership-jetp/

## 4. 50 years of project tiger

**Concept-**
**Tiger**

- India has 70% of the global tiger population.
- The **International Tiger Day celebrated on 29th July** is an annual event marked to raise awareness about tiger conservation.
- First international Tiger's day was celebrated in 2010 at the St. Petersburg Tiger Summit.
- The Tiger, Panthera Tigris, is listed as 'Endangered' on the IUCN Red List of Threatened Species TM. The largest of all cats, the tiger once occurred throughout central, eastern and southern Asia.

**Project tiger**
The Govt. of India had launched **"Project Tiger"** on **1st April 1973** to promote conservation of the tiger. Project Tiger has been the **largest species conservation** initiative of its kind in the world. While the field implementation of the project, protection and management in the designated reserves is done by the project States, who also provide the matching grant to recurring items of

expenditure, deploy field staff/officers, and give their salaries, the **Project Tiger Directorate of the Ministry of Environment and Forests** was mandated with the task of providing technical guidance and funding support.

Project Tiger started tiger conservation starting with nine reserves – **Manas, Palamau, Simlipal, Corbett, Ranthambhore, Kanha, Melghat, Bandipur and Sundarban.**

The implementation of Project Tiger over the years has highlighted the need for a statutory authority with legal backing to ensure tiger conservation. On the basis of the recommendations of **National Board for Wild Life chaired** by the Hon'ble **Prime Minister**, a Task Force was set up to look into the problems of tiger conservation in the country. The recommendations of the said Task Force, interalia include strengthening of Project Tiger by giving it statutory and administrative powers, apart from creating the **Wildlife Crime Control Bureau**. It has also recommended that an annual report should be submitted to the Central Government for laying in Parliament, so that commitment to Project Tiger is reviewed from time to time, in addition to addressing the concerns of local people.

## NTCA

Considering the urgency of the situation, Project Tiger has been converted into a statutory authority (NTCA) by providing enabling provisions in the Wild Life (Protection) Act, 1972 through an amendment, viz. Wild Life (Protection) Amendment Act, 2006. This forms one of the urgent recommendations of the Tiger Task Force appointed by the Prime Minister.

The NTCA addresses the ecological as well as administrative concerns for conserving tigers, by providing a statutory basis for protection of tiger reserves, apart from providing strengthened institutional mechanisms for the protection of ecologically sensitive areas and endangered species. The Authority also ensures enforcing of guidelines for tiger conservation and monitoring compliance of the same, apart from placement of motivated and trained officers having good track record as Field Directors of tiger reserves. It also facilitates capacity building of officers and staff posted in tiger reserves, apart from a time bound staff development plan.

The Wild Life (Protection) Amendment Act, 2006 has come into force with effect from the 4th of September, 2006, and the NTCA has also been constituted on the same date.

## St. Petersburg Declaration on Tiger Conservation

- This resolution was adopted In November 2010, by the leaders of 13 tiger range countries (TRCs) assembled at an International Tiger Forum in St. Petersburg, Russia
- It aimed at promoting a global system to protect the natural habitat of tigers and raise awareness among people on white tiger conservation.
- The resolution's implementation mechanism is called the Global Tiger Recovery Program whose overarching goal was to double the number of wild tigers from about 3,200 to more than 7,000 by 2022.
- 13 Tiger range countries are: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Russia, Thailand and Vietnam.

## Conservation efforts- National and Global:

- The National Tiger Conservation Authority (NTCA) has launched the **M-STrIPES (Monitoring System for Tigers – Intensive Protection and Ecological Status),** a mobile monitoring system for forest guards.
- At the Petersburg Tiger Summit in 2010, leaders of 13 tiger range countries resolved to do more for the tiger and embarked on efforts to double its number in the wild, with a popular slogan **'T X 2'.**
- The **Global Tiger Initiative (GTI)** program of the **World Bank,** using its presence and convening ability, brought global partners together to strengthen the tiger agenda.
- Over the years, the initiative has institutionalized itself as a separate entity in the form of the **Global Tiger Initiative Council (GTIC),** with its two arms –the Global Tiger Forum and the Global Snow Leopard Ecosystem Protection Program.

## Global

With the phasing out of the **Global Tiger Initiative** by the **World Bank,** which was a global alliance to conserve the tiger, the wild tiger agenda has been mandated to the inter-governmental platform, the **Global Tiger Forum (GTF),** as an implementing arm of the restructured **Global Tiger Initiative Council (GTIC).** A concerted portfolio of performance by tiger range countries (TRCs) is reviewed with complimentary support as a part of the Global Tiger Recovery Program (GTRP).

**Global Tiger Forum** is an international intergovernmental body exclusively set up for the conservation of tigers in the wild in the range countries. Out of the **13 tiger range countries**, seven are currently members of GTF: Bangladesh, Bhutan, Cambodia, India, Myanmar, Nepal and Vietnam besides **non-tiger range country U.K.** The secretariat is based in New Delhi, India. GTF's goal is to highlight the rationale for tiger preservation and provide leadership and a common approach throughout the world in order to safeguard the survival of the tiger, its prey, and its habitat.

## 5. Bandipore Tiger Reserve

**Context: 50 years of Bandipore**
**Concept** –

- It was established in 1973 **under Project Tiger**. In 1985, by including adjacent areas from **Venugopala Wildlife Park**, it was enlarged and named as Bandipur National Park.
- It is situated in two contiguous districts (Mysore and Chamarajanagar) of Karnataka and is located at the **tri-junction area of the States Karnataka, Tamil Nadu and Kerala**.

- It forms a **part of Nilgiri Biosphere Reserve**.
- It lies in one of the richest biodiversity areas of the country. It is surrounded by
  - **Mudumalai Tiger Reserve** (Tamil Nadu) in the South,
  - **Wayanad Wildlife Sanctuary** (Kerala) in the South-west &
  - **The Kabini Reservoir** separates the Bandipur and Nagarahole Tiger Reserve on the North-west.
- It is endowed with rich floral and faunal diversity and is recognized as one of the **Mega Biodiversity Areas in the country.**
- The **Bandipur along with Nagarahole, Mudumalai, Sathyamangalam& Wayanad** constitutes the single **largest Wild population of Tigers in the world.**
- This Landscape is also home to the **single largest Asian Elephant population** in the world and is part of the **Mysore Elephant Reserve (MER).**
- The park is located between the **Kabiniriver** in the north and the **Moyar river** in the south. The **Nugu river** runs through the park. The highest point in the park is on a hill called **HimavadGopalaswamy Betta**

## 6. Great Nicobar Project

**Concept :**

- Great Nicobar Development Plan, **spread over 166 sqkm of the 910 sqkm island**, is an **under-construction mega infrastructure project for the southern tip of Great Nicobar Islandin Andaman Sea of India.**
- Budget for the project is estimated to be around 72,000 crores.
- The Project has geostrategic importance for defence, logistics, commerce and industries, eco-tourism, coastal tourism, Coastal Regulation Zone, etc. It has four components:
- **Galathea Bay International Container Transhipment Terminal** (Galathea Bay ICTT), with 14.2 million TEUs (unit of cargo) capacity eventually.
- **Great Nicobar International Airport (GNIA)**: greenfield airport with peak hour capacity of 4,000 passengers.
- **Great Nicobar Gas and Solar Power Plant** (Great Nicobar GSPP): with 450-MVA capacity, spread over 16,610 hectares.
- **Coastal cities: two new greenfield coastal cities.**

**Concerns: Environmental impact & mitigation**
**Flora:**

- Due to this project, **island will loss 12 to 20 hectares of mangrove cover,** which will be compensated by afforestation in Haryana's Aravallis as per rules which allow for such remote compensatory afforestation.

**Corals:**

- To mitigate the risk of loss of corals, the corals will be translocated in the reefs around the island.

**Fauna**:

- The **project area within a 10 km radius of Galthea Bay is ecologically sensitive zone and home of rare fauna such as Leatherback Sea Turtles**, salt **water crocodile, Nicobar macaque**.
- To mitigate the risk, the Indian MoEFCC's Expert Appraisal Committee has proposed three conservation sites for fauna – Little Nicobar, Menchal Island and Meroe Island.
- **People**:
- This project will increase the population to over 3.5 lakh (350,000), which may cause a threat to the indigenous communities.
- Around 1761 inhabitants, **including indigenous Shompen people and Nicobarese communities of this island,** are likely to be affected by this project.
- 853 square kilometers of this **island is designated as tribal reserve under the Andaman and Nicobar Protection of Aboriginal Tribes Regulation, 1956.**
- This means that the **land is meant for exclusive use of the community and others cannot access the area without their express permission.**
- Around 10% of tribal reserve of the island will be affected by this project.
- According to **Forest Rights Act, 2006, Shompen people are legal sole authority to preserve the forest reserve.**

## 7. At AsolaBhattisanctuary, a 'seed bank' of plants native to the Aravallis

A 'SEED bank', which collects and stores seeds of species of plants that are native to the Aravallis, is gradually taking shape at a nursery at the Asola Bhatti Wildlife Sanctuary, after a few years of efforts at collecting seeds from across the city and other state, The project, being implemented jointly by the Forest Department and the Bombay Natural History Society (BNHS), began in 2015withthepurpose of providing saplings that are native to the city and bringing back species that are now difficult to find in the city with some having lost out to invasive species like the vilayatikikar which have taken over the Ridge
**What is seed bank?**

A seed bank is a facility that stores seeds in order to maintain genetically pure variety for future generations. Typically, they are flood, bomb, and radiation-proof vaults that store seeds from various plant species. The seeds are usually stored in climate controlled, low humidity and frigid temperatures. This aids in the long-term preservation of the seeds, guaranteeing that they will grow at a later day.

As per one estimate, there are over 1700 seed banks around the world, each with its own type, size, and concentration. The Svalbard Global Seed Vault, often known as the "doomsday vault" or "Noah's ark of seeds," seeks to hold a duplicate of every seed stored in other banks throughout the world. Svalbard has the capacity to store up to 4.5 million kinds of crops and 2.5 billion seeds. It contains about 1.14 million seed samples from over 6,000 distinct plant species.

## WHY SEEDS BANKS ARE ESSENTIAL

The first step of growing food starts from seed. To sustain the planet and all living beings, plants are paramount. Since plants are threatened by a variety of factors, including loss of habitat, climate change, pollution, pests, and diseases, seed banks serve as an institution in building agricultural resilience in the times of crisis. It is estimated that 40% of plant species are threatened with extinction on a global scale. Plants that are rare, heritage, indigenous, wild, or locally distinctive are all at risk of extinction. Their extinction could result in the genetic deterioration of our food system.

Without good genetic diversity, adapting to climate change or new pests can be challenging. Crop breeders require a diverse set of genetic resources to aid in the adaptation of our crops to changing situations. A seed bank is a type of insurance, that allows us to safeguard as many plant species as possible from extinction.

## BENEFITS OF SEED BANKS

Plant genetic diversity is important for a variety of reasons, and seed banks help to preserve it. These conserved seeds contain a wealth of beneficial genes that breeders might employ to build improved varieties of our most important food crops. A few specific benefits of seed banks:

- Improve plant disease and pest resistance, both existing and emerging
- Allow for drought or flood resistance
- To feed a growing global population, increase yields and improve nutrition

The Kunming Institute of Botany's Germplasm Bank of Wild Species of China is striving to preserve the seeds of as many wild plants as possible from across China's huge land area. Many wild plants have genes that enable them to thrive in difficult conditions and make them resistant to diseases and drought. We may need these genetic resources in the future to produce new crops that can better adapt to shifting climate.

## Why Aravalli important?

- The Aravalli is the National Capital Region's critical water recharge zone, climate regulator, wildlife habitat and barrier against desertification

## Aravalli:

- The Aravalli Range (also spelled Aravali) is a mountain range in Northwestern India.
- It runs approximately 670 km (430 mi) in a south-west direction, starting near Delhi, passing through southern Haryana and Rajasthan, and ending in Gujarat.
- The highest peak is Guru Shikhar at 1,722 metres (5,650 ft). Guru Shikhar is a peak in the Arbuda Mountains of Rajasthan. It is 15 km from Mount Abu.
- Three major rivers and their tributaries flow from the Aravalli, namely Banas and Sahibi rivers which are tributaries of Yamuna, as well as Luni River which flows into the Rann of Kutch.

## 8. 170 trillion Plastic Particles Afloat In The World's Oceans

### Concept:

- **170 trillion plastic particles are currently afloat** in the oceans across the world, according to a new study, which added that if **no urgent action is taken then this number could nearly triple by 2040.**

### Details of the study

- 'A growing plastic smog, now estimated to be over 170 trillion plastic particles afloat in the world's oceans — Urgent solutions required', done by researchers from 5 Gyres Institute, Win Cowger of Moore Institute for Plastic Pollution Research and Stockholm Resilience Centre.
- In 2014, it was estimated that there were 5 trillion plastic particles in the ocean.
- From 1990 to 2005, the number of plastic particles more or less fluctuated.
- One of the reasons for this could be due to the effective implementation of important policy measures at the time.
- In the 1980s and 90s, there were some international policies, like MARPOL Annex 5 that enforced laws against dumping trash at sea. They were powerful laws that were enforceable and were preventative.
- Since 2005 humanity has produced more than 5,000,000 tons of new plastic into the world, and with more plastic there is more pollution.

### About microplastics

- Plastic debris is found in the environment in a very wide range of sizes.

- Researchers first reported finding tiny beads and fragments of plastic, especially polystyrene, in the ocean in the early 1970s.
- The term 'microplastics' was introduced in the mid-2000s.
- Today, it is used extensively to describe plastic particles **with an upper size limit of 5 mm.**

**Why are microplastics in the ocean receiving increasing attention?**

- Marine litter – especially plastic debris in the ocean – is a major global environmental issue.
- **Physical effects**
- Microparticles can be ingested by filter-feeding marine organisms such as oysters and mussels.
- They have been observed to close the gut wall and induce a reaction within the tissue.
- Microplastics in the seawater present an additional stressor if they affect the filter-feeder system inside the whale's mouth.
- **Chemical effects**
- The **ecotoxicological profiles of compounds** added to plastics to achieve certain properties are generally well known. These additives can be transferred from a plastic particle into an organism.
- Seawater is contaminated with a wide variety of organic and inorganic pollutants. Many plastics absorb organic contaminants, such as the **pesticide DDT and polychlorinated biphenols (PCBs), to a high degree.**
- These compounds can cause chronic human health effects, including disruption of the hormonal system (endocrine disruption), inducing genetic changes (mutagenicity) and cancer (carcinogenicity).
- Once ingested by fish, birds or sea mammals, the compounds – which penetrate the structure of the plastic – may start to leach out.
- Organisms become continuously contaminated by contact with their environment and by ingestion of contaminated food.

**Sources of plastic debris**

- **Sea-based sources include:**
  - Merchant shipping – rope, galley waste
  - Fishing – nets, boxes, rope, wrapping bands, galley waste
  - Aquaculture – nets, floats, rope
  - Offshore oil and gas platforms – galley waste, sewage-related
  - Cruise ships – galley waste, sewage-related (may be equivalent to a medium-sized town)
  - Recreational boating – galley waste, sewage-related
- **Land-based sources include:**
  - Coastal tourism – packaging, cigarette filters
  - Population centres – sewagerelated, storm drains, street litter
  - Horticulture/agriculture – plastic sheeting, tubing
  - Poorly controlled waste sites and illegal dumping – all waste types
  - Industrial sites – plastic production and conversion, packaging
  - Ship-breaking

**Global Partnership on Marine Litter :**

- GPML is a **voluntary, open-ended partnership for governments, international agencies, businesses, academia, local authorities, NGOs and individuals**, launched during the United Nations Conference on Sustainable Development (Rio+20) in June 2012.

**Honolulu Strategy**

- The Honolulu Strategy is a framework for a comprehensive and global effort to reduce the ecological, human health and economic impacts of marine debris. The framework consists of three goals and associated strategies:

**9. Eravikulam National Park gets a fernarium**

**Context:** Eravikulam National Park (ENP) in Kerala, the natural habitat of the Nilgiritahr in Munnar, has a new attraction — a fernarium set up inside the park. According to officials, this is the first time such a fern collection is being set up in the hill station.
**Eravikulam National Park:**

- Eravikulam National Park is a protected area **located in the Idukki district of Kerala**, India. It was established in **1978 to protect the endangered Nilgiritahr**, which is endemic to the Western Ghats.
- Eravikulam National Park is **located in the Western Ghats**, in the Idukki district of Kerala. It covers an area of 97 square kilometers.
- Eravikulam National Park is **known for its unique montane grassland ecosystem**, which is found in the **higher altitudes of the Western Ghats**.
- Highest peak south of the Himalayas – the **Anamudi is located here.**
- Park **receives heavy showers during the southwest** (June/July) and **retreating (October/November) Monsoons** and is one of the wettest area of the World.

- The park is home to a **number of endemic plant species**, including the Neelakurinji, which blooms once every 12 years.
- The park is home to a number of species of mammals, birds, and reptiles. The most famous resident of the park is **the Nilgiritahr,** a species of mountain goat that is endemic to the Western Ghats.
- Other mammal species found in the park include the **Indian muntjac, Indian porcupine, and stripe-necked mongoose.** The park is also home to a variety of bird species, including the Nilgiri pipit, Nilgiri wood pigeon, and Nilgiri flycatcher.
- The Nilgiritahr population in the park has been **threatened by habitat loss and poaching.** The park also faces **threats from invasive plant species** and **tourism-related activities.**

## Fernarium:

- A fernarium is a **specialized greenhouse or botanical garden** that is devoted to the **cultivation and study of ferns**. It is a facility where ferns and their close relatives, such as **mosses and liverworts, are grown, displayed and studied**.
- Fernariums are **designed to create the ideal conditions for growing ferns**, including appropriate levels of humidity, temperature, light, and ventilation. They typically have a variety of specialized equipment, such as misting systems, humidifiers, and shading devices, to maintain these conditions.
- Fernariums are **important resources for the study of ferns** and their ecology, as they provide a controlled environment for experimentation and observation. They also serve as **centers for conservation efforts**, as many fern species are threatened or endangered due to habitat destruction and other human activities.
- Fernariums are **popular tourist attractions,** as they provide an opportunity for visitors to see and learn about a diverse range of fern species from around the world.

## Ferns

- A fern (Polypodiopsida or Polypodiophyta) is a member of a group of vascular plants (plants with xylem and phloem).
- They are some of **the oldest plants on Earth**, having first appeared more than 300 million years ago. There are over 10,000 known species of ferns, which are found in a wide variety of habitats around the world, **from tropical rainforests to arid deserts and from sea level to high altitudes.**
- They **grow naturally in a soilless condition**. The plants **obtain water and nutrients through leaching** from trees.
- Ferns have a unique **life cycle that includes both sexual and asexual reproduction**. The sexual reproductive phase involves the produc**tion of spores, which are dispersed by wind or water and grow into new plants**. The asexual reproductive phase involves the growth of rhizomes, which are underground stems that produce new leaves and roots.
- Ferns are unique among plants in that they **do not have flowers or seeds**. Instead, they **reproduce by means of spores**, which are produced in structures called sporangia.
- Ferns are important plants in many ecosystems, **providing food and shelter for a variety of animals.** They also play a **role in soil conservation**, as their **deep root systems help to stabilize soil and prevent erosion**. Many fern species have **medicinal properties** and are used in traditional medicine to treat a variety of ailments.

## 10. New butterfly species discovered in Kerala

**Context:** Caltorisbromussadasiva is the first Bromus swift butterfly to be documented in the Western Ghats.
**More on the News:**

- A group of lepidopterists has discovered a butterfly subspecies from the fringes of Akkulam and Vembanad lakes in Kerala.
- The newly-described taxon **Caltorisbromussadasiva** has been discovered by Travancore Nature History Society research associate KaleshSadasivan.
- It is also the **first record of the species Bromus swift**( Caltorisbromus).
- The butterfly was first spotted at Akkulam lake in 2005 and later in Vembanad in 2009 by Dr.Sadasivan, who subsequently reared the species from larvae on the host plant Phragmites karka (tall reed) to confirm the identity of the taxon.

## Caltorisbromussadasiva

- Caltorisbromussadasiva is **the first Bromus swift butterfly** to be documented in the Western Ghats.
- The species Bromus swift (CaltorisBromus), is a **skipper butterfly** belonging to the **Hesperiidae family of Lepidoptera** (moths and butterflies), from the Western Ghats and Peninsular India.
- Caltoris is an **Indo-Australian genus** has over 15 species distributed across southeast Asia.
- CaltorisBromus is one of them and has two other subspecies **Caltorisbromusbromus and Caltorisbromusyanuca.**
- The butterfly has a wingspan of around 3-4 cm and has a dark brown colour with a purple gloss. It has a distinctive thin, curved, purple line on the upper surface of its wings.
- The Indian Purple Line is usually **found in moist deciduous forests and in degraded forests** with a dense undergrowth of shrubs and herbs. It is also **found in tea plantations and along streams in hilly areas.** The butterfly feeds on the nectar of various plants including the Flame-of-the-forest, wild flowers, and lantana.

## 11. India has registered a global first of a plant fungus infecting human

**Context:** A 61-year-old man from Kolkata has been recently diagnosed with an infection from Chondrostereum Purpureum, a deadly plant fungus, in what is said to be the first such known case in the world.
**More on the News:**

- The fungus, Chondrostereum purpureum, is known to cause **Silver leaf disease in plants**, especially in **species of rose families**. However, there were no reported instances of this fungus infecting human beings from any part of the world.
- Of the hundreds of millions of fungal species, o**nly a few cause infections in humans.** This may be the start of a new phenomenon when **plant fungus is adapting to invade human cells by evading the process of 'phagocytosis'.**
- The process, which means 'cell eating', happens when a **cell uses its plasma membrane to engulf a large particle, giving rise to an internal compartment** called the 'phagosome'. Organisms clean and defend themselves by this process.
- **Rising temperature** due to global warming is thought of as one of the major reasons for this **new threat to human beings**. Most fungi thrive in the range of 12°C to 30°C. However, many species are thermotolerant and can withstand high temperatures.
- Global warming means the **narrowing of the thermal difference between the human body and its surroundings.** Every degree increase in the global average temperature reduces this gradient by about five per cent. This **increases the chance of the prevalence of fungal diseases.**

### Chondrostereum Purpureum:

- It is a **plant fungus** that **causes silver leaf disease in plants**, particularly those in the rose family.
- It is **commonly found in temperate regions** of the northern and southern hemispheres.
- It attacks **most species of the rose family** Rosaceae, particularly the genus Prunus.
- It is often **found on old stumps and dead wood**, but can also be a serious parasite of living trees.
- The **disease is progressive and often fatal**. Once inside the plant, it **grows slowly** and can **remain latent for years before symptoms develop**. Infected plants typically show a **distinctive silvering or bluish-gray discoloration** of the leaves and a decline in vigor, which can eventually lead to death.
- It is **spread by airborne** spores landing on freshly exposed sapwood.

## 12. Evolutionary lineages of the banded krait discovered through molecular methods

**Context:** A recent study finds that the highly venomous banded krait (Bungarusfasciatus) is likely to be an assemblage of different species across Asia.
**More on the News:**

- In recent years, **genetic analysis methods** have been increasingly **used to identify cryptic species** (species that may look identical but are evolutionarily distinct lineages) in vertebrates. These methods have been employed to identify genetically different species in reptiles and snakes.
- Studies have **noted the possibility of differences** within species using methods such as genetic barcoding. And **studies are necessary to accurately identify and delineate snake species**, especially those that are venomous, because of the implications of the composition of snake venom and what this means for developing efficient anti-venom.
- Using a combination of genetic and physical structure analyses, **identified three distinct evolutionary groups** of the banded krait occupying non-overlapping regions – **Indo-Myanmar (**east and north-east India and Myanmar), **Sundaic** (Greater Sunda islands), and **east Asian** (mainland Sundaland including southern China).
- An interesting finding from the analyses of **one common gene across the three groups revealed that the Indo-Myanmar and Sundaic lineages** had negligible genetic differences within themselves whereas the **east Asian lineage contained a wider range of genetic differences.**
- The study goes on to state that if these three different groups are accepted as independent species, that **the Indo-Myanmar group is the original banded krait species** that was first described in 1794; however, more generally, the **east Asian and Sundaic groups may be referred to as banded kraits as well.**

**Banded krait:**

- Banded krait, also known as the **common krait**, is a **venomous snake species** found in South and Southeast Asia.
- It belongs to the family Elapidae, which also **includes cobras and coral snakes.**
- The banded krait is **easily recognized by its black and white bands**, which run the length of its body and are broader than the intervals between them. Adults can grow up to 1.8 meters in length.
- The venom of the banded krait is **highly toxic and can cause respiratory paralysis**, which can be fatal if left untreated.
- Despite its venomous nature, the banded krait is **relatively shy and non-aggressive towards humans,** and is **usually active at night**.
- It primarily f**eeds on other snakes, including cobras** and other venomous species.
- Snake that inhabits different landscapes **like agricultural lands, forests, and home gardens** up to specific elevations.
- The banded krait is **listed as a "Least Concern"** species by the International Union for Conservation of Nature (IUCN) due to its widespread distribution and relatively stable population.

## 13. Triple trouble for Gulf of Mannar islands, study finds

**Context:** An invasive plant from South America is threatening to pulverise indigenous plants across the 21 islands where 96 species of birds have been recorded.

**More on the News:**

- An alien invasive plant is threatening to pulverise native vegetation across 21 islands in the Gulf of Mannar Biosphere Reserve (GoMBR), an avian distribution study has revealed.
- Prosopis chilensis, a drought-resistant plant native to the arid regions of four South American countries — Argentina, Bolivia, Chile, and Peru — is not the only trouble for these islands divided into the Tuticorin, Vembar, Kilakkarai, and Mandapam groups.
- The **coral reef has been destroyed in several places** near these islands although coral quarrying for industrial purposes has been outlawed, the study published in the Journal of Threatened Taxa said.

**Prosopis chilensis:**

- The Prosopis chilensis is also known as **Chilean mesquite**.
- It is a small to medium-sized legume tree that **grows up to 12 m in height** and 1 m in diameter.
- It is a **drought-resistant plant native to the arid regions** of four South American countries namely Argentina, Bolivia, Chile, and Peru.
- The tree has a **deep root system**, which **enables it to access water from underground** aquifers and makes it resistant to drought.
- Prosopis chilensis is used for several purposes, including as a **source of firewood, charcoal, and tanni** Its wood is also used for making furniture and as a material for construction.
- The tree is known for its **ability to fix nitrogen from the air**, which makes it useful for improving soil fertility.
- In some regions, the **pods of Prosopis chilensis are used as a food source for** humans and livestock. The pods are rich in protein and have a sweet flavor.
- Prosopis chilensis is also considered an **invasive species in some parts of the world, including Australia and South Africa,** where it has displaced native vegetation and altered ecosystem dynamics.

**Gulf of Mannar Biosphere Reserve (GoMBR):**

- Gulf of Mannar Biosphere Reserve is a **protected area located in the southeastern coast of India**, in the state of Tamil Nadu. It **was established in 1989**.
- The Gulf of Mannar Biosphere Reserve includes a **marine national park, 21 islands, and the adjacent coral reefs**.
- The area is known for its **high marine biodiversity** and is home to many threatened species, including the **sea cow (dugong) and various species of sea turtles**.
- Apart from the marine ecosystem, the reserve also includes **several terrestrial ecosystems such as mangroves, forests, and grasslands**. The reserve is home to many endemic plant species, including the mangrove palm and the sea hibiscus.
- The Gulf of Mannar Biosphere Reserve has been **recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a Biosphere Reserve, a World Heritage Site, and a Ramsar Wetland of International Importance**.
- It is the **first Marine Biosphere Reserve** in South and South East Asia.

## 14. The war on Tigray wiped out decades of environmental progress

**Context:** Two-year war and siege on Tigray region has **set Tigray's restoration back by decades**. The conflict has had a devastating impact on both people and the environment.

**More on the News:**

- As many as 600,000 people have died, mainly due to man-made starvation.

- The environment has been destroyed by aerial and ground bombardment, the use of dangerous chemicals and vehicle and army movement. Forests and conservation and restoration structures were destroyed by military activity. The landscape is littered with waste and abandoned military material.
- According to World Peace Foundation, **the destruction of the environment was also a tool of war**. Tigrayan communities are highly dependent on natural resources for food, fuel and feed. Agriculture contributes 42.7 per cent to GDP, about 85 per cent of employment and 70 per cent of export earnings. **Armies deliberately destroyed fruit trees, forests, soil conservation structures and nursery structures.** Grass harvests used for **animal feed were burned**. The destruction of the ecosystems will in **turn affect food security and the climate** for a long time to come.
- **Restoring the environment also needs urgent attention** so that societies can produce food and goods to rebuild their lives.
- Environmental restoration plan to ensure Tigray's recovery is green and sustainable:
    - **Ecosystems contaminated** by shelling and bombardments, destroyed industrial, agricultural and health facilities and military waste should be dealt with as hotspots.
    - A **thorough assessment of the direct and indirect impacts** and losses is needed.
    - **The post-war environment recovery** must put the needs of the community at the centre.
    - **Farm households and farmlands should get priority**. Farmers should be provided with oxen and improved agricultural farm goods, to improve their subsistence farming and to scale up agroforestry practices.
    - **Introduce urban farming practices** to bring greenery and a sustainable lifestyle closer to home.
    - **Rehabilitating research facilities**

## Ethiopia:

- It is a **landlocked country** located in the **Horn of Africa**, officially known as the Federal Democratic Republic of Ethiopia.
- The country **lies completely within the tropical latitudes** and is relatively compact, with similar north-south and east-west dimensions.
- The **capital is Addis Ababa**.
- Ethiopia is located from Sudan in the southeast, Eritrea to the south, Djibouti and Somalia to the west, Kenya to the north, and South Sudan to the east.
- It is the **most populous landlocked country** in the world.

## 15. International Conference on Human-Wildlife Conflict and Coexistence

**Context:** International Conference on Human-Wildlife Conflict and Coexistence is being held in Oxford, the United Kingdom.
**More on the News:**

- The **International Conference on Human-Wildlife Conflict and Coexistence** being held in Oxford, the United Kingdom from March 30-April 1, 2023 has brought together hundreds of representatives f rom conservation organisations, academia, governments, businesses and indigenous as well as local communities from six continents and 70 countries to discuss solutions.
- The **first conference of this scale** is **being organised by the International Union for Conservation of Nature (IUCN), the Food and Agriculture Organization** of the United Nations, the UN Development Programme and several more.
- The **new IUCN Guidelines provide a clear steer on how to go about managing complex situations**, and will inform the formulation of new policies and community-led action strategies for achieving coexistence with wildlife in any context.

## International Conference on Human-Wildlife Conflict and Coexistence

- IUCN Species Survival Commission (SSC) Human-Wildlife Conflict & Coexistence Specialist Group, **the Global Environment Facility-funded and World Bank-led** Global Wildlife Program and the Wildlife Conservation Research Unit at Oxford University's Department of Biology are **co-hosting this International Conference** on Human-Wildlife Conflict and Coexistence in Oxford, UK, on 30th March-1st April 2023.
- The conference is organised in collaboration with the IUCN Commission on Environmental, Economic and Social Policy (CEESP), the Food and Agriculture Organization (FAO) of the United Nations, the United Nations Development Programme (UNDP) and several more organisations.
- The International Conference on Human-Wildlife Conflict and Coexistence aims to
    - **Facilitate dialogue and peer-to-peer learning across sectors** and actors on the topic for partnerships and collaboration across people and institutions working on human-wildlife conflict.
    - **Generate interdisciplinary and shared understanding** of the latest insights, technologies, methods, ideas, and information from the field of human-wildlife conflict, coexistence and interactions.
    - **Mainstream human-wildlife conflict** as one of the top global priorities in biodiversity conservation and the Sustainable Development Goals for the next decade, catalysing opportunities for working together on national, regional or global policies and initiatives.

- **Identify and develop a collective way forward for addressing knowledge and implementation gaps** for effective efforts to reduce and manage human-wildlife conflict.

## 16. Ban on pesticides

<u>Context:</u> Plea in Supreme Court alleges restriction on reduced number of chemicals to protect companies
<u>More on the News:</u>

- A recent notification by the central government going back on its **decision to ban 27 pesticides identified as health hazards** by an expert committee has been flagged in the Supreme Court of India. A **petition has sought a ban on all 27 pesticides, not just three**, as proposed by a February 16, 2023 notification.
- The central government in **May 2020 had proposed banning 27 harmful pesticides identified as health hazards by an expert committee.**
- However, a draft notification by the Union Ministry of Agriculture and Farmers Welfare published on **February 16 went back on the proposal, claiming just three of the 27 were "fit to be banned".**
- The **list of 27 was carved out of a more extensive set of 66 suggested to be banned** to protect the farmers and consumers of the country.
- On January 23, the Supreme Court directed the Centre to file an updated status report on the actions taken to regulate the ban on hazardous pesticides.

More details on Pesticide Ban https://optimizeias.com/decision-on-pesticide-ban-likely-this-week/

## 17. Time to put a price on carbon emissions

**Concept :**

- Seeing the increase in carbon emission, it is time, starting with the biggest economies of the G20, to agree on valuing nature, including by pricing carbon events.
- **India can take the lead, as president of the G20 this year, in carbon pricing,** which will open unexpected avenues of decarbonisation.

**Carbon Pricing Mechanisms**:

- **Three major carbon pricing mechanisms** are as follows:
- **A carbon tax** can be established domestically, like in Singapore and Korea.
- The European Union (EU) and China use **emissions trading system (ETS).**
- The EU has also proposed the **application of an import tariff on carbon content**.
- Around 46 countries price carbon. However, it covers only 30% of global greenhouse gas (GHG) emissions at an average price of only $6 per ton of carbon.
- The International Monetary Fund has proposed price floors of $75, $50, and $25 a ton of carbon for the United States, China, and India, respectively. It can help in achieving a 23% reduction in global emissions by 2030.
- It should be noted that carbon pricing encourages investment in renewable energy like solar and wind energy.

**Carbon Pricing**

- Carbon pricing is the **value ascribed to the external costs – usually social costs** – of **pollution emitted by an industry.**
- Carbon pricing is **done either through a carbon tax or an emission trading system**.
- **Ways of pricing**
- **Defining rate:** A **carbon tax directly sets a price on carbon by defining an explicit tax rate on GHG emissions** or— more commonly—on the carbon content of fossil fuels.
- **Market price for GHG emissions**: An **emissions trading system (ETS)** is a system where **emitters can trade emission units to meet their emission targets**. To comply with their emission targets at least cost, regulated entities can either implement internal abatement measures or acquire emission units in the carbon market, depending on the relative costs of these options. By creating supply and demand for emissions units, an ETS establishes a market price for GHG emissions
- **Carbon credits**: Crediting **Mechanisms issue carbon credits**, these credits can be used to meet compliance under an international agreement, domestic policies or corporate citizenship objectives related to GHG mitigation.

**Understanding carbon pricing**

- **Captures the external costs of GHG**: Carbon pricing captures the external costs of greenhouse gas (GHG) emissions— the costs of emissions that the public pays for (crop damage, health care costs from heat waves and droughts, and property loss from flooding and sea level rise) and ties them to their sources through a price, usually in the form of a price on the carbon dioxide ($CO_2$) emitted.
- **Shifting the burden of damage**: It helps shift the burden for the damage from GHG emissions back to those who are responsible for it and who can avoid it.

- **Economic signal-** Instead of dictating who should reduce emissions where and how, a carbon price provides an economic signal to emitters, and allows them to decide to either transform their activities and lower their emissions, or continue emitting and paying for their emissions.

**Impact on India:**

- Benefits of a carbon tax in India:
- It is more appealing as it discourages fossil fuels.
- It will raise revenue which can be further invested in cleaner sources of energy.
- It would replace the inefficient scheme of petroleum taxes which are not directly aimed at emissions.
- Many countries including India have established the basic structure needed to implement a carbon tax in their fiscal policy.
- However, policymakers should choose the tax rate which can range from $2.65 a ton of $CO_2$ (in Japan) to $165 a ton (set by Denmark for 2030).
- India can start with the IMF-prescribed figure of $25 a ton.

**Associated Concerns:**

- It should be noted that carbon pricing faces stiff political opposition. For instance:
- Australia repealed the 2012 tax just two years after it was introduced.
- Rising energy prices in the EU led to the selling of millions of emission permits. It caused a 10% fall in carbon prices.
- One of the major issues in this regard is that industrial firms might lose their competitive advantage to exporters from countries with lower carbon prices.

*For further notes on Carbon Pricing, refer – https://optimizeias.com/carbon-pricing/*

## 18. Arctic scientists race to preserve 'ice memory'

**Concept :**

- Arctic scientists are set to start drilling to save samples of ancient ice for analysis before the frozen layers melt away due to climate change, mission organizers said.
- They will extract ice in a series of tubes from as far as 125 metres (137 yards) below the surface, containing frozen geochemical traces dating back three centuries.

**Why preserve ancient ice?**

- Analysis of chemicals in deep "ice cores" provides scientists with valuable data about past environmental conditions.
- Studies indicate that the Arctic is warming between two and four times faster than the global average.

**How will it be preserved?**

- One set of ice tubes will be used for immediate analysis while a second set will be sent to Antarctica for storage in an "ice memory sanctuary" under the snow, where the samples will be preserved for future generations of scientists.

## 19. Europe's droughts are affecting tourism

**Concept :**

- Much of Europe is experiencing persistent drought. From Italy to Spain, holiday makers face restrictions as a result.
- Sever tourist attractions like **Lake Garda in Italy, North of the Alps in Switzerland and Germany, Rhine River, Font Magica fountain spectacle in Barcelona, island of Mallorca in spain are facing severe crisis.**

**Lake Garda**

- It is the **largest lake in Italy.**
- It is known for its **crystal-clear water**.
- The lake and its shoreline are divided between the provinces of Brescia (to the south-west), Verona (south-east) and Trentino (north).
- Lake Garda has been reduced to its lowest level ever recorded in decades.
- **Reason- River Po, Italy's longest reiver, have dried up due to scarcity of rainfall in northern Italy.**
- To compensate, authorities allowed more water from Lake Garda to flow out to local rivers. This resulted in drying of the lake.

**About Alps:**

- The Alps emerged during the Alpine orogeny (mountain-building event), an event that began about 65 million years ago as the Mesozoic Era was drawing to a close.
- Alps are **young fold mountains with rugged relief and high conical peaks.**
- They are the most prominent of western Europe's physiographic regions. Some 750 miles long and more than 125 miles wide at their broadest point between Garmisch-Partenkirchen, Germany, and Verona, Italy, the Alps cover more than 80,000 square miles.
- The Alps extend north from the subtropical Mediterranean coast near Nice, France, to Lake Geneva before trending east-northeast to Vienna, Austria.
- There they touch the Danube River and meld with the adjacent plain.
- Because of their arc like shape, the Alps separate the marine west-coast climates of Europe from the Mediterranean areas of France, Italy, and the Balkan region.
- **Countries Covered:**
- The Alps form part **of France, Italy, Switzerland, Germany, Austria, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, and Albania**.
- **Only Switzerland and Austria can be considered true Alpine countries**.



**Important Peaks:**

- **Mont Blanc is the highest peak in the Alps** and in Europe, reaching a lofty 4,804 meters above sea level.
- It is located in the Graian Alps and lies within France, Switzerland, and Italy.
- **Monte Rosa is a massif** (a compact group of mountains) consisting of several peaks.

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- The highest peak in this range (Dufourspitze) has an elevation of 4,634 meters, claiming the title of Switzerland's highest peak.
- Dom, which is located near Monte Rosa, Dom stands at 4,545 meters and is known as one of the "easier" tall peaks in the Alps to summit because of it's straightforward routes.
- Other major peaks are Liskamm, Weisshorn, Matterhorn, Dent Blanche, Grand Combin etc.

**Belaric Islands, Spain**

- The **Balearic Islands is an archipelago located in the Mediterranean Sea** that forms an autonomous community and province of Spain.
- The archipelago is composed of **four major islands, Mallorca, Menorca, Ibiza, and Formentera, as well as smaller islands and inlets.**
- **Mallorca or Majorca is the largest island in the Balearic Islands**, which are part of Spain, and the seventh largest island in the Mediterranean Sea.



**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 a**nd **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.**

## 20. UN Water Conference

**Concept:**

- Recently, the United Nations 2023 Water Conference was held in New York, USA.

**About UN 2023 Water Conference:**

- Since the first UN Water Conference was held in Argentina in 1977, the Earth's population has doubled to 8 billion people and demand for water is skyrocketing.
- The UN 2023 Water Conference was, as the UN said, the most important water event in a generation.
- Objective – To raise awareness of the global water crisis and decide on action to achieve internationally agreed water-related goals.
- On March 22-24, it was **co-hosted by Netherlands and Tajikistan.**

**Water Conference's Outcomes**

- The complexity of today's water problems was reflected in the conference's proceedings – a **lot of talk, fragmented discussions**, and **no binding commitments.**
- Instead, there **were 713 diverse voluntary commitments by philanthropic donors, governments, corporations, and NGOs.**
- 120 of these were relevant to India. They included a **USD 50-billion commitment from the India to improve rural drinking water services under its Jal Jeevan Mission.**
- On the technology front, there were several proposals for incubation platforms focusing on water management.
- An effort called '**Making Rights Real' offered to help marginalised communities and women understand how to exercise their rights.**
- The '**Water for Women Fund'** offered **mechanisms for more effective and sustainable water, sanitation, and hygiene outcomes for women**.
- **W12+ Blueprint :**
- **W12+ Blueprint is a UNESCO platform** hosting city profiles and case studies of programs, technologies, policies that addresses common water security challenges.
- It is an **online information tool** for informing those working on urban water issues, thought leadership, and advocacy around global water solutions.

## 21. European cities go climate neutral by 2030

**Concept:**

- The EU is pushing for 100 cities **including Paris, Madrid and Amsterdam** to reach net-zero emissions by the end of the decade — far earlier than their national governments plan to get there.
- As governments across the world have promised to stop polluting carbon emissions by 2050, scores of European cities have pledged to get there by 2030 — just seven years from now.
- **Berlin, which is not on the list, held a referendum in March on moving its target forward to 2030.**

**Background**

- The **Intergovernmental Panel on Climate Change** found that the **world needs to cut carbon emissions to net-zero by the middle of the century**.
- To keep global temperatures from rising by more than 1.5 degrees Celsius (2.7 degrees Fahrenheit) — the target to which world leaders promised to try to limit global warming — humanity must cut pollution fast.
- **Net-zero means** societies have to suck out as much carbon as they pump into the atmosphere. But technologies to remove carbon dioxide are limited and scientists are unsure how much they can absorb.
- Still, that finding has led more than 100 countries to set net-zero targets for around 2050. Pressure is also rising on rich countries who have polluted the most, particularly those in Europe and North America, to move faster.

## EU Mission: Climate-Neutral and Smart Cities

- Cities play a pivotal role in achieving climate neutrality by 2050, the goal of the European Green Deal. They take up only 4% of the EU's land area, but they are home to 75% of EU citizens. Furthermore, cities consume over 65% of the world's energy and account for more than 70% of global CO2 emissions.
- **Aims of the Mission**
- The Cities Mission will involve local authorities, citizens, businesses, investors as well as regional and national authorities to
- **Deliver 100 climate-neutral and smart cities by 2030**
- Ensure that these **cities act as experimentation and innovation hubs to enable all European cities to follow suit by 2050**
- As foreseen in its implementation plan, the **Cities Mission takes a cross-sectoral and demand-led approach,** creating synergies between existing initiatives and basing its activities on the actual needs of cities.

## NetZero Cities Project

- **NetZero Cities is part of the Horizon 2020 Research and Innovation Programme** in **support of European Union's Green Deal**.
- NetZero Cities has been designed to help cities overcome the current structural, institutional and cultural barriers they face in order to achieve climate neutrality by 2030.

## Climate Neutrality

- Climate neutrality refers to the idea of **achieving net zero greenhouse gas emissions by balancing those emissions so they are equal** (or less than) the emissions that get removed through the planet's natural absorption; in basic terms it means we reduce our emissions through climate action.
- Note : UN Climate Change launched **Climate Neutral Now back in 2015 in order to encourage stakeholders around the world to work towards net zero emissions and a climate neutral world.**

## Climate Neutral Now Initiative

- The Climate Neutral Now Initiative is one of several **initiatives launched by the UNFCCC secretariat to increase climate action by engaging non-Party stakeholders** (sub-national governments, companies, organizations, individuals).
- It was launched in 2015 based on a mandate to promote the voluntary use of carbon market mechanisms recognized under the Convention.

## 22. Decline in pollinators

**Context:** Decline in pollinators linked to half a million premature human deaths every year, shows study.
**More on the News:**

- Half a million people are currently dying prematurely every year due to global insect **pollinator decline that has impacted the availability and price of healthy foods** such as nuts, legumes, fruits and vegetables, finds a new modeling study.
- **Middle-income countries**, including India, Russia and China are **among the hardest hit.** Wealthy nations were more immune from pollinator decline.
- The world's pollinators are vanishing for a host of reasons, but the largest is loss of habitat. Other escalating impacts include the use of pesticides and climate change.

## Pollination

- When a **pollen grain moves from the anther (male part) of a flower to the stigma (female part)**, pollination happens and it is the first step in a process that produces seeds, fruits, and the next generation of plants.
- This can happen **through self-pollination, wind and water pollination** or through pollinators.

## Pollinators

- Vectors that **move pollen within the flower and from flower to flower** are called pollinators.
- They visit flowers to drink nectar or feed off of pollen and transport pollen grains as they move from spot to spot.
- There are **two categories of pollinators**:
  - **Invertebrate pollinators:** Include bees, moths, flies, wasps, beetles and butterflies.

- **Vertebrate pollinators**: Include monkeys, rodents, lemurs, tree squirrels and birds.

## Significance of Pollination:

- **Ecosystem**: Pollinators play a crucial role in maintaining the ecosystem. Pollinators are **responsible for pollinating a large variety of flowering plants**, which in turn provides food, shelter, and habitat for many other animals. They also help in the formation of **fruits, berries, and nuts** that are a source of food for birds and mammals.
- **Agriculture:** Pollination is essential for agriculture as it is directly responsible for the production of fruits, vegetables, and grains. About **75% of global food crops rely on pollinators** for their reproduction. Without pollinators, many of our favorite foods, such as **apples, strawberries, and almonds**, would be difficult to grow.
- **Biodiversity:** Pollination is essential for maintaining biodiversity as it ensures the continuation of various plant species. **Without pollinators**, many **plant species would not survive,** which would have a ripple effect on the entire ecosystem.
- **Economic benefits:** Pollination has significant economic benefits. The value of crops that depend on pollinators exceeds \$200 billion annually worldwide.

## Reason for declining Pollination

- **Loss of Habitat**: Destruction of habitat is one of the main reasons for the decline in pollination. Many plant species that depend on pollinators for reproduction have lost their habitats **due to deforestation, urbanization, and other land-use changes**.
- **Pesticide Use:** Pesticides are widely used in agriculture to **control pests and diseases**. However, these chemicals can also **harm pollinators, including bees, butterflies, and other insects.** Pesticide residues on flowers and plants can kill or weaken pollinators, making them less effective at pollination.
- **Climate Change**: Climate change has also affected pollinators and their habitats. Changes in temperature and rainfall patterns have **altered the timing of flowering and the emergence of pollinators,** making it difficult for them to synchronize their life cycles.
- **Invasive Species**: Invasive species can also **compete with native plants for pollinators**, **disrupting the natural balance of ecosystems**. Some invasive plants, such as the Japanese knotweed, can also outcompete native plants for pollinators.
- **Monoculture Farming:** Monoculture farming practices have also contributed to the decline in pollination. These practices involve growing **large areas of a single crop, which reduces the diversity of flowering plants** available for pollinators.
- **Bee Diseases:** Diseases such **as Varroa mites, Nosema fungus, and American foulbrood have also affected bee populations**, reducing their effectiveness as pollinators. These diseases can weaken and kill bees, reducing their numbers and pollination services.

## Way forward:

- **Plant a diverse range of native plants**: A diverse range of plants will also ensure a longer flowering season, providing pollinators with a consistent source of food.
- **Provide nesting sites:** Many pollinators, such as bees and butterflies, require nesting sites to **lay their eggs and rear their young**. Providing nesting sites such as hollow stems, logs, or bare ground can help support pollinator populations.
- **Reduce pesticide use:** Limiting the use of pesticides or choosing **less harmful alternatives can help protect pollinators.**
- **Create habitat corridors:** By creating habitat corridors, pollinators can more easily move between habitats, increasing their chances of survival.

## 23. Panel recommends new central body to mitigate water woes

**Context:** State- and central-level bodies that currently bear responsibility for issues related to water, lack coordination between them, a Parliamentary Standing Committee report has noted.

### More on the News:

- The report, tabled in the Lok Sabha two weeks ago, also **recommended the Union Ministry of Jal Shakti (water resources) constitute a central body** with representation from the bodies.
- The bodies, alluded to by the committee, include:
  - The **Union Ministry of Rural Development, and Agriculture and Farmers' Welfare**
  - **State departments, state and central pollution control boards**
  - Dedicated authorities such as the **Central Ground Water Board (CGWB) and the Central Ground Water Authority (CGWA)**
- The Committee observed that **dependence on groundwater for irrigation** was excessive. This was so because water-intensive crops like paddy and sugarcane command higher minimum support price (MSP), it noted.
- Laws **on groundwater management were passed in 19 states** based on a model Bill circulated in 1970 and last revised in 2005. The **Committee observed difficulties in implementing these laws due to the lack of guidelines.**

- The Committee, meanwhile, recommended the **department of water resources, river development, and ganga rejuvenation takes urgent action** in this regard.
- A **lack of sharing of data and coordination** between bodies responsible for addressing groundwater pollution such as state government departments, pollution control boards, and agencies such as the CGWA.
- **It further recommended** amendment of the Water (Prevention and Control of Pollution) Act, 1974, "to enable **pollution control boards to impose monetary penalties**, as a less severe penalty than the outright closure of industrial units".

## Central Ground Water Board

- Central Ground Water Board (CGWB) is a governmental organization **under the Ministry of Jal Shakti** that is **responsible for developing and managing groundwater** resources in India.
- The CGWB was **established in 1970 as** part of the Ground Water Wing of the Central Water Commission.
- The primary objective of the CGWB is to c**arry out surveys and assessment of the groundwater resources** in India and develop plans and policies for their conservation and management.
- Some key functions of the CGWB include:
    - **Conducting hydrogeological studies** and monitoring of groundwater levels and quality across the country.
    - **Developing groundwater management plans** for areas facing water scarcity or overexploitation.
    - **Regulating groundwater extraction** through the issuance of no-objection certificates (NOCs) and other permits.
    - **Promoting rainwater harvesting** and artificial recharge of groundwater.
    - **Providing technical assistance** and training to stakeholders, including state governments, local bodies, and NGOs.

## Central Ground Water Authority

- Central Ground Water Authority (CGWA) is a regulatory body under the **Ministry of Jal Shakti, Government of India**.
- It was established in 1970 **under the provisions of the Environment (Protection) Act, 1986**.
- The primary mandate of CGWA is to **regulate and control the development and management of groundwater resources** in the country.
- Some of the key functions of CGWA are as follows:
    - **Grant of No Objection Certificates** (NOCs) for **groundwater withdrawal**: CGWA is responsible for granting NOCs to industries, infrastructure projects, and other water-intensive activities for groundwater withdrawal in over-exploited, critical, and semi-critical areas.
    - **Monitoring of groundwater levels**: CGWA monitors the groundwater levels in **different parts of the country and prepares an annual groundwater assessment report.** It also monitors the implementation of groundwater management plans.
    - **Regulation of groundwater use:** CGWA regulates the use of groundwater by imposing restrictions on its withdrawal, **fixing the maximum permissible limit** for groundwater extraction, and enforcing penalties for non-compliance.

## 24. Idu -Mishmi Tribes and Dibang Wildlife Sanctuary

**Concept :**

- National Tiger Conservation Authority (NTCA) has said that the Dibang Wildlife Sanctuary in Arunachal Pradesh would soon be notified as a tiger reserve.
- The announcement has caused disquiet among the **area's Idu Mishmi people, who feel that a tiger reserve would "hinder their access"** to the forest.
- **Idu Mishmi – Tiger brothers**
- **The Idu Mishmi** is a **sub-tribe of the larger Mishmi group** (the other two Mishmi groups are Digaru and Miju) in **Arunachal Pradesh** and neighbouring Tibet.
- Known for their weaving and craftsmanship skills, the **IduMishmis primarily live in Mishmi Hills, bordering Tibet.**
- Their ancestral homelands are **spread over the districts of Dibang Valley and Lower Dibang Valley as well as parts of Upper Siang and Lohit.**
- The tribe is estimated to comprise around 12,000 people (as per census 2011), and their **language (also called Idu Mishmi) is considered endangered by UNESCO**.
- Traditionally animists, the tribe has strong ties with the region's rich flora and fauna. Animals such as the hoolock gibbons and tigers have deep cultural relations with the Idu Mishmi.
- **Tigers are especially important to the IduMishmis** — according to Idu mythology, they were born to the same mother, and thus, **tigers are their "elder brothers".**
- While hunting has traditionally been a way of life, the IduMishmis also follow a strict **belief system of myths and taboos — 'iyu-ena'** — that restrict them from hunting many animals, including a complete prohibition on killing tigers.

**Reasons for resistance**

- In its **current form as a wildlife sanctuary**, the community's **access to the Dibang forests has not been impacted.**
- But many say a **tiger reserve would increasingly restrict access**.

- An upgrade to a tiger reserve would feature stricter security measures like a 'Special Tiger Protection Force', which would be guarding the area at all times. This, the community believes, would cut off access to their forest lands.
- Moreover, members of the community claim that Dibang Wildlife Sanctuary was created **without people's consent or knowledge**.

**About Dibang Wildlife Sanctuary:**

- It is located nearby Anini district, Arunachal Pradesh.
- It has been **named after the Dibang River, a tributary of Brahmaputra River**.
- It **occupies part of the Eastern Himalayas**, and is a massive spread of lofty mountains, snow covered peaks, deep gorges, lush forests and glistening rivers.
- Its altitude **ranges between 1800m and 5000m.**
- **Flora:**
- The two main categories of vegetation are **temperate broad leaved forest** and **temperate conifer forest** (Rhododendra, Bamboo, Gregaria, Tsuga etc).
- **Alpine vegetation occurs at higher altitude with herbs, stunted trees and dwarf bushes.**
- **Fauna:**
- **Mishmi takin, asiatic black bear, tigers, gongshan muntjac, red panda, red goral and musk deer.**

**25. Amazon forests save $2 billion in pollution healthcare: study**

**Context:** Forests in Indigenous territories by absorbing pollution particles prevent a potential 15 million smoke-related respiratory and cardiovascular infections per year.

**More on the News:**

- Rainforests on Indigenous lands in Brazil's **Amazon protect millions of people from heart and lung diseases** by absorbing pollution and **save $2 billion a year in healthcare costs,** researchers said in a study published Thursday, urging increased protection against deforestation.
- The article in the journal Communications Earth & Environment measured the forests' **capacity to absorb smoke pollution from fires that are intentionally started to clear land for farming**.
- Combined analysis of 10 years of data on disease, forest cover and pollution found that each hectare of forest burned generates health costs of $2 million (1.8 million euros) a year due to lung and heart infections.
- **Inhabited areas with large areas of forest had fewer infections** than those with low cover, with particulate matter in the air reduced by the greenery.

**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**.
- A **30 percent of all species** on Earth are found in the Amazon rainforest.
- As the largest tropical rainforest in the world, it is the **source of 20% of the oxygen** used by the planet.
- The rainforest of the Amazon is **home to 400–500 indigenous Amerindian tribes**

**Significance of Amazon Rainforest:**

- **Rich biodiversity:** More plant and animal species can be found in the Amazon than in any other terrestrial ecosystem in the world; it may contain up to **30 percent of all species.**
- **Precipitation:** The Amazon rainforest **produces between 50 and 75 percent of the world's precipitation** through transpiration. Rainfall in the Western United States and Central America is influenced by moisture from the Amazon.
- **Carbon storing potential**: Massive amounts of carbon are sequestered by the 390 billion trees that make up the Amazon rainforest in their leaves, branches, and trunks. About 86 billion tonnes of carbon are stored in forests or **more than a third of the carbon stored by tropical forests worldwide.**
- **Climate control:** The hydrological system of the Amazon plays a significant part in preserving the local and global climate. Because of the hydrological cycles that depend on the forests, the Amazon's canopy cover plays an important role in regulating temperature and humidity and is intricately linked to regional climate patterns.
- **Medicinal knowledge**: Ingredients from the Amazon rainforest are used in one-fourth of all western medicine. The Amazon **provides 70% of the plants that are effective against cancer cells.**
- **Air purifier**: With its extensive vegetation, which **continuously absorbs carbon dioxide and releases oxygen**, it serves as a giant air purifier.

### 26. With increasing climate-related threats, farmers gear up for adaptation

**Context**: A 2022 study highlights that farmers are recognising changes in weather patterns and independently adapting to its impact on agriculture. Researchers say that targeted policy intervention will make adaptation meaningful.

**More on the News:**

- Indian Institute of Wheat and Barley Research (IIWBR), a leading scientific institute for wheat, released an **advisory recommending farmers in India to spray potassium chloride on wheat crops in case of a sudden rise in temperature**. This was to **avoid heat-induced damage caused by temperatures** increasing by as much as 10 degrees above normal in some wheat-growing areas of the country.
- **A month later**, in the second half of March, IIWBR again released an advisory, but this time it suggested that as light to heavy rains are expected, farmers should keep tabs on the IMD weather update and prevent water logging of the fields. It **also advised farmers not to spray chemicals in these climatic conditions.**
- These advisories, that came close together but with differing recommendations, **reflect the weather uncertainties that farmers face and have to adapt to.**

**Impact of weather uncertainties on agriculture:**

- The government, which earned $2121.5 million in 2021-22 from exporting wheat, **banned export in May 2022 after the heatwave affected production**. That restriction continues. With the **expected effect of El Nino, which may cause drought-like situations, India**, one of top wheat producing countries, may now need to import wheat.
- **Yield reduction:rainfed rice yields** are projected to **reduce by 20% in 2050 and 47% in 2080 scenarios** while irrigated rice yields are projected to reduce by 3.5% in 2050 and 5% in 2080 scenarios. Climate change is projected to r**educe wheat yield by 19.3% in 2050 and 40% in 2080** scenarios towards the end of the century with significant spatial and temporal variations.
- **Farm incomes losses:** Economic survey underlined the **farm income losses of 15% percent to 18% on average, rising to 20-25% for unirrigated areas.**

**Farmers independently developing climate adaptation methods:**

- Even if all the mitigation measures are applied, the impact of climate change will be visible for several decades. In this case, the **role of adaptation becomes important**. We should **combine local adaptation with national and global mitigation initiatives** to deal with climate change impact. For adaptation, we need a targeted initiative like training so that it can become more meaningful.
- Mitigation requires a global effort, but **adaptation can be done locally**. Farmers are trying to cope with the changing weather pattern on their own. Their adaptation strategies **vary from region to region**. **Engaging with the community is necessary** to understand what works better.

**Difference between adaptation and mitigation:**

- **Mitigation** means **making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases** (GHG) into the atmosphere. Mitigation is achieved **either by reducing the sources of these gases** — e.g. by increasing the share of renewable energies, or **establishing a cleaner mobility system** — or **by enhancing the storage of these gases** — e.g. by increasing the size of forests. In short, mitigation is a human intervention that reduces the sources of GHG emissions and/or enhances the sinks.
- **Adaptation** means **anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage** they can cause, or taking advantage of opportunities that may arise. Examples of adaptation measures include **large-scale infrastructure changes**, such as **building defenses** to protect against sea-level rise, as **well behavioral shifts**, such as individuals reducing their food waste. In essence, adaptation can be understood as the process of adjusting to the current and future effects of climate change.

**Adaptation initiatives taken at international level**

- The **United Nations Framework Convention on Climate Change**(UNFCCC) runs a program called **the Global Environmental Facility**, which provides some **funding for adaptation to least developed countries** and Small Island states.
- Under the GEF umbrella, the GEF Trust Fund, the **Least Developed Countries Fund (LDCF), and the Special Climate Change Fund (SCCF)** operate to carry out the climate change adaptation financing goals of the GEF.
- Another UNFCCC mechanism is The **Adaptation Fund** which provides funds for projects that prove to have additional benefits for adaptation to climate change. The **Clean Development Mechanism (CDM) set up as part of the Kyoto Protocolis the main source of incom**e for the UNFCCC Adaptation Fund.
- The **Copenhagen Accord**, commits developed countries **to goal of sending $100 billion per year to developing countries** in assistance for climate change mitigation and adaptation through 2020. This climate change fund is called the **Green Climate Fund.**

### 27. For species in the red, IUCN's new Green Status signals conservation wins

**IUCN Green Status**

- The IUCN Red List of Threatened Species is the **global standard for assessing the risk of extinction** that individual species of animal, fungus, and plant faces.
- To achieve this, the Red List assessment process **has been expanded to include new classifiers of species recovery and conservation** impact, known as the Green Status of Species.
- The IUCN Green Status of Species complements the Red List by **providing a tool for assessing the recovery of species' populations and measuring their conservation success**.
- IUCN Green Status **classifies species into nineSpecies Recovery Categories**, indicating the extent to which species are depleted or recovered compared to their historical population levels.
- Each Green Status **assessment measures** the **impact of past conservation on a species, a species' dependence on continuing support, how much a species stands to gain from conservation action within the next ten years**, and the **potential for it to recover over the next century.**
- The **development of the IUCN Green Status** of Species Global Standard was **led by the IUCN Species Conservation Task Force, in partnership with the IUCN Red List of Threatened Specie**s, IUCN Species Survival Commission, Re:wild, Wildlife Conservation Society, University of Oxford, Stony Brook University, Durrell Wildlife Conservation Trust and Zoological Society of London.
- Green Status of Species provides a **more comprehensive picture of a species' conservation status,** beyond the traditional red list categories of extinct, critically endangered, endangered, vulnerable, near threatened, least concern, and data deficient.
- It also enables conservation practitioners to **track progress towards conservation targets over time and identify areas where conservation efforts need to be intensified**.

## Green Status Define Recovery

- The Green Status **assesses species against 3 essential facets** of recovery:
    - A **species is fully recovered if it is present in all parts of its range**, even those that are no longer occupied but were occupied prior to major human impacts/disruption; AND
    - It is **viable** (i.e., not threatened with extinction) in all parts of the range; AND
    - It is **performing its ecological functions** in all parts of the range.
- These factors contribute towards a "**Green Score**" **ranging from 0–100%,** which shows how far a species is from its "fully recovered" state.

## 28. How short-beaked echidnas beat the heat

**Context:** With about 100 mucous secreting glands, this Australian mammal blows snot bubbles to bring down its body temperature.

**More on the News:**

- Short-beaked echidnas of the semi-arid Dryandra Woodland in Western Australia face searing hot summers. They can't pant like dogs to cool off since their long, thin, sticky tongues are useful only to feed. Neither do they sweat as we do. Nor do they lick their arms like kangaroos whose evaporating saliva cools the underlying blood vessels. Vultures squirt watery poop on their naked legs for the same reason.
- Just as **the thorns of cacti reduce heat loss, so do the two-inch-long spines of echidnas.** When the quills are slicked back, they trap warmth. **When they are raised, heat escapes.** Another strategy of the domestic cat-sized animals is to **lie flat, pressing their spineless stomachs to the cool soil** with their legs and noses stretched out.
- The pencil-thin, three-inch tubular snout is the egg-laying mammal's prey detection kit. It is **covered with electroreceptors** that detect the underground wrigglings of ants, termites, and grubs. These **sensors work only when they are moist**. For this reason, the echidna's nose has about 100 mucous secreting glands.
- Viewed through a **thermal camera**, the **echidna's pointy nose appears blue, much cooler than the rest of its body**, which glows in the warm colours of orange, pink and red. When a hot animal blows mucus balloons that burst over its nose, evaporation cools the blood vessels inside the snout. **Circulating this blood through the body brings down the body temperature.**

## Echidnas:

- Echidnas, also known as **spiny anteaters**, are small**, egg-laying mammals** found in Australia and New Guinea. They are **one of only two extant monotremes** (the other being the platypus) which are mammals that l**ay eggs instead of giving birth to live young**.
- Echidnas are **covered in spines**, which protect them from predators. They use their **strong claws to dig into the ground** and create burrows where they can rest during the day.
- They have a **long, sticky tongue** that they **use to capture insects and other small prey**. They do not have teeth, so they grind up their food with keratinous pads in their mouths.
- Female echidnas lay a single leathery egg, which hatches after about 10 days. The young, called puggles, are **born without spines** and are c**arried in a pouch on the mother's belly until they are able to survive** on their own.
- Echidnas are important to the ecosystem because they **help to control insect populations.**

- However, echidnas are facing threats from habitat loss and fragmentation, vehicle collisions, and predation by introduced predators such as foxes and cats. Climate change is also a potential threat, as it may affect the availability of insects, which are a major food source for echidnas.
- Echidnas are **listed as Least Concern on the IUCN Red List of Threatened Species**, but some subspecies are considered to be vulnerable or endangered.

## 29. Spot Billed Pelican and Pulicat Lake

**Concept :**
**About Spot Billed Pelican**

- The Spot-billed Pelican is a **large water bird found in India and other parts of Southeast Asia.**
- It is the **only pelican species that is known to breed in India**, and it is **listed as Near Threatened on the IUCN Red List** due to habitat loss and hunting**.**
- The Spot-billed Pelican can be **found in wetlands, lakes, rivers, and estuaries, where it feeds on fish, frogs, and other aquatic prey.**
- They have weak leg muscles which is not ideal for, therefore they catch fish near the surface of the water.
- This species sometimes goes fishing in groups, forming a semi-circle that pushes the fish towards shallow water. It also forms a foraging partnership with the little cormorant.
- Cormorants are divers, and their dives cause the fish present in deeper regions to scatter towards the surface, where the pelican awaits them.
- Adult spot-billed pelicans weigh 4.5-5 kg. The pouch, which is called the gular, is for catching fish.
- **Spot-billed pelicans form stable colonies along with other water birds**. Nests are built on trees, and two-three eggs are laid. When they are about a month old, the chicks destroy the nests.
- Breeding colonies occur very close to, or even within villages. Villagers use the droppings of the spot-billed pelican as a fertiliser.
- After the breeding season, pelican populations scatter over a very large area as they forage for food.
- The best places to spot the Spot-billed Pelican in India are the **Keoladeo National Park in Rajasthan, Pulicat Lake, Andhra Pradesh, the Vedanthangal Bird Sanctuary in Tamil Nadu, Chilika Lake in Odisha, KokkareBellur and Karanji Lake in Karnataka**.

**Pulicat Lake**

- Pulicat Lagoon is the **second largest brackish water lagoon in India**, **after Chilika Lake**. It is present in the Coromondal Region i.e. **Andhra Pradesh–Tamil Nadu Border**.
- The **barrier island of Sriharikota separates the lake from the Bay of Bengal** and is home to the Satish Dhawan Space Centre.
- The lake **encompasses the Pulicat Lake Bird Sanctuary**.
- **Flamingo Festival is held every year to** promote tourism in Pulicatlake and Nellapattu. It has been organised for the past 12 years
- The primary inflows to the Pulicat Lake are **Arani, Kalangi and Swarnamukhi**.
- About **96% of the Pulicat Lake is present in Andhra Pradesh while only 3% is present in Tamil Nadu.**
- The Buckingham Canal, a navigation channel, is part of the lagoon on its western side.

## 30. Tiger Census 2022

**Context:** Tiger Census 2022: India's tiger population increased by 200 in last four years. The tiger population numbers were made public by Prime Minister at an event to mark the International Big Cat Alliance conference as well as the 50th anniversary of Project Tiger

**Census Findings:**

- The tiger population in India **grew by 200 from 2018 to 2022**, according to the fifth cycle of the All India Tiger Estimation (2022).
- The number of tigers in India was **3,167 in 2022, up from 2,967 in 2018**, the report showed.
- The **growth**, however, **slowed to 6.7 per cent** in these four years from around 33 per cent during 2014-2018, analysis of the latest data showed.
- The tiger population has grown the **most in the Shivalik hills and Gangetic flood plains**, followed by **central India, the north eastern hills, the Brahmaputra flood plains**, and the Sundarbans. There was a **decline in the Western Ghats numbers, though "major populations" were said to be stable**.
- **Decline in tiger occupancy** was also observed outside the protected areas of **Anamalai-Parambikulam complex**. Although the tiger populations in the Periyar landscape remained stable, the tiger occupancy has declined outside Periyar.

- Tiger occupancy in **Jharkhand, Odisha, Chhattisgarh and Telangana** showed a decline.
- The **genetically unique and small population of tigers in Simlipal** is of high conservation priority in the landscape.
- The **northeastern hill tiger populations are genetically unique** and should be the top priority of conservation action in the country due to their low population size and genetically unique lineage
- With **tigers increasing outside Tiger Reserves** in the landscape (Shivalik hills and Gangetic plains), Uttarakhand and Uttar Pradesh need to invest in mitigating conflict with tigers and mega herbivore.
- The wildlife habitats (Protected Areas and corridors) within this region (Central Indian highlands and Eastern Ghats) face a range of threats, including **habitat encroachment, illegal hunting of both tigers and their prey**, conflicts between humans and wildlife, unregulated and illicit cattle grazing, excessive harvesting of non-timber forest produce, human induced forest fires, mining, and ever-expanding linear infrastructure. This region is also having several mines of important minerals, hence mitigation measures like lower mining impact techniques and rehabilitation of mining sites should be done on priority.

**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.

**International Big Cat Alliance (IBCA):** https://optimizeias.com/global-alliance-for-big-cats/#:~:text=Context%3A%20India%20to%20launch%20global,(over%20Rs%20800%20crore).

**31. Theppakkadu elephant camp**

**Mudumalai Tiger Reserve**, **Theppakadu Elephant camp** is the oldest elephant camp in Asia. This elephant camp was established 100 years before. This elephant camp having 28 elephants including 2 calves at present. In this elephant camp elephants are mainly used in Human- Wild animal conflicts, Forest Mansoon patrolling, eco-tourism, elephant conservation, Education etc.
The Elephant camp is located on the bank of the **river Moyar**, opposite to the Reception center.

**32. Climate change is the architect of new human species**

**Context:** Fossil records tell us that physical changes typically take 500,000 years to appear
**More on the News:**

- Changes in **water availability, rainfall, temperature and humidity, either globally or locally, can shape evolution**. Looking at the origin and evolution of humans, many climatic changes have occurred over millions of years. Six million years ago, **human ancestors separated from a branch comprising of chimpanzees and gorillas.**
- This **new branch became known as hominin,** which includes humans and the extinct humans and our immediate ancestors that could walk upright. This change corresponded to climatic changes.
- Humans have **evolved from unicellular organisms**, thanks to climatic conditions. If conditions had not changed, perhaps there would have been **only been microbes in the ocean**. If you look at life as a tree, the branches kept changing until humans reached a particular branch.
- The **bacteria that did not change perhaps lived in an environment that was constant**, so they stayed the same.
- There are **two kinds of changes**: **genetic and phenotypic** (observable, physical changes). Even now, genetic changes keep happening automatically. But they do not necessarily translate to changes in the human body or physical appearance.
- **Physical changes occur only if there is a change in our diet or locomotion**. For example, if a species ingests tough food, it will develop a heavy jaw. If it evolves to consume softer food, a heavy jaw is useless, and it recedes.
- Climate change **resulted in the most dramatic change in us: the brain size**. That happened with our genus, *Homo*. The brain size of our ancestors belonging to the genus *Australopithecus*or *Paranthropus or Ardipithicines* were ape-like. They **lived in climatic conditions that did not require a big brain.** Their diet and lifestyle did not need that either.
- Approximately two million years ago, there were **dramatic climatic changes**. The conditions were not conducive to human survival. **Hunter-gatherers had to move around, change their diet, communicate and develop strategies to hunt**. They needed to build tools to survive. So **humans began to use their brains more, which would have affected the size of the organ.**

- The **brain capacity almost doubled** from Australopithecus. Within our genus, Homo habilis still had lower brain capacity. But the brain capacity of Homo erectus and Homo heidelbergensis dramatically increased. We have seen this in our fossil record.
- In the present day, **we see genetic changes due to climate changes**. These changes **allow people living in high-altitude regions or colder climates to live in extreme conditions**.
- Drastic changes can also occur, but clim**atic fluctuations occur at a rate of hundreds of thousands of years.** The **human body is complex, and it takes millions of years for changes to occur.**
- **Seeing genetic change**s in Europeans if hot and dry conditions become recurrent. Around 13-14 million years ago, Europe was warm and humid. Roughly 16-18 varieties of apes lived there. And then the climate changed, transforming Europe into a cooler place. All apes disappeared from the continent.
- Later, it became **inhabited by Neanderthals who adapted to colder climates**. Much later, **Homo sapiens came in**. They were **smart enough to adapt to changing situations**. They **migrated to greener pastures**. Other human species died out because they could not adapt. Every species evolves in its niche.
- And **if that niche becomes inhabitable due to climate change, the species would perish or migrate.**

## 33. Periyar Tiger Reserve gets top rank in management review

**Context:** Periyar Tiger Reserve in Kerala is the best-maintained of all tiger reserves in the country, according to the 5th cycle of Management Effectiveness Evaluation (MEE) carried out by the Centre.

**More on the News:**

- Periyar reserve has **obtained an MEE score of 94.3%,** it is followed closely by the Satpura Tiger Reserve in Madhya Pradesh, Bandipur in Karnataka and Nagarhole in Karnataka.
- The government has been using the MEE to assess tiger reserves across the country since its inception in 2006.
- The MEE results also suggested an overall improvement in the management effectiveness of the tiger reserves.
- There has been continuous improvement with the subsequent cycles of evaluation in MEE scores of tiger reserves in India. The overall mean MEE score in the second cycle in 2010 was 65%, 69% in third cycle in 2014, and 70% in fourth cycle of evaluation in 2018 and 77.92% in present assessment.

### Management Effectiveness Evaluation

- Management Effectiveness Evaluation (MEE) is a **methodology used to evaluate the effectiveness of protected areas and their management**. The MEE is carried out to **assess the strengths and weaknesses** of a protected area management system and to identify areas that need improvement.
- The MEE is **conducted by a team of experts** who review the management practices of the protected area and determine how well they are achieving the objectives of the protected area.
- The MEE methodology was **developed by the World Conservation Union** (IUCN) and has been **widely adopted by many countries around the world**. The MEE is conducted using a set of standard criteria that are used to evaluate the management of the protected area.
- **There are 30"Headline Indicators" developed under six elements** of MEE framework suitable in Indian context for evaluation.
- The MEE process involves a **site visit to the protected area by the evaluation team**, who meet with the protected area management staff, local communities, and other stakeholders. The **team reviews documents, conducts interviews, and visits key sites within the protected area to assess its management effectiveness**.
- The results of the MEE are **used to develop action plans to improve the management of the protected area**. The MEE **also provides a baseline for monitoring and evaluating** the progress of management improvements over time.
- At present, the country has 998 Protected Areas – including 106 National Parks, 567 Wildlife Sanctuaries, 105 Conservation Reserves and 220 Community Reserves — covering 1,73,629 sq km or 5.28% of India's geographical area.
- Of these **53 tiger reserves, however, only 51**, covering a total area of 73,765 sq km, were evaluated as two newly declared tiger reserves, Ramgarh Visdhari and Ranipur, have not been included in the current cycle of MEE.

### Periyar Tiger Reserve

- Periyar Tiger Reserve is a protected area in the **Idukki district of Kerala**, India. It is **located in the Cardamom Hills of the Western** Ghats and is named after the Periyar River that flows through the area.
- **Flora**: The reserve is **rich in tropical evergreen and semi-evergreen forests, moist deciduous forests, and grasslands**. It is home to a wide variety of flora, including over 2000 species of flowering plants.
- **Fauna:** The reserve is home to a large number of endangered species, including the **Bengal tiger, Indian elephant, gaur, sambar deer, barking deer, Nilgiri langur, and lion-tailed macaque**.
- **Birdlife:** Periyar Tiger Reserve is also a haven for birdwatchers, with over 265 species of birds, including the **great Indian hornbill, Malabar grey hornbill, blue-winged parakeet, grey-headed bulbul, white-bellied tree pie, and Nilgiri wood pigeon.**
- **Periyar Lake**: The Periyar Lake is an **artificial lake** that was created by the **construction of the Mullaperiyar Dam across the Periyar River**. The lake is an important source of water for the animals in the reserve, and it is also a popular tourist attraction.

- **Periyar Wildlife Sanctuary**: The Periyar Wildlife Sanctuary is located within the Periyar Tiger Reserve and covers an area of 777 square kilometers. It is notable as an elephant reserve.
- **Tribal communities**: The reserve is home to a number of tribal communities, including the **Mannans, Paliyas, and Uralis**. These communities have lived in the area for centuries and have a deep knowledge of the forest and its flora and fauna.

TN Assembly resolution seeks 'time limit' for Governors to clear Bills

## 34. Over half of heavy industry eyeing low carbon hydrogen

**Concept :**

- As many as **62% of heavy industry companies across sectors are looking at low-carbon hydroge**n to replace carbon-intensive systems, says a **new report from the Capgemini Research Institute.**
- The report, "**Low-Carbon Hydrogen – A Path to a Greener Future**," also found that on average, Energy and Utilities (E&U) companies expect low-carbon hydrogen to meet 18% of total energy consumption by 2050.

**Green Hydrogen**

- It is a **colourless, odourless, tasteless, non-toxic and highly combustible** gaseous substance.
- Hydrogen is the lightest, simplest and most abundant member of the family of chemical elements in the universe.
- **Future hydrogen**: The colour — green — prefixed to it makes hydrogen the "fuel of the future".
- The 'green' depends on how the electricity is generated to obtain the hydrogen, which does not emit greenhouse gas when burned.
- Green hydrogen is **produced through electrolysis using renewable sources of energy such as solar, wind or hydel power.**

**Uses:**

- **Chemical industry**: Manufacturing ammonia and fertilisers.
- **Petrochemical industry**: Production of petroleum products.
- Furthermore, it is starting to be used in the steel industry, a sector which is under considerable pressure in Europe because of its polluting effect.

**Other Types of Hydrogen:**

- **Brown Hydrogen**: Most of the gas that is already **widely used as an industrial chemical** is either brown, if it's made through the **gasification of coal or lignite**.
- **Grey Hydrogen**: If it is made **through steam methane reformation**, which typically uses **natural gas as the feedstock**. Neither of these processes is exactly carbon-friendly.
- **Blue Hydrogen**: Where the gas is **produced by steam methane reformation** but the **emissions are curtailed using carbon capture and storage.**

## 35. Radioactive contamination increasingly found in scraps for recycling

**Context:** Radioactive contaminated metal, if used to manufacture household goods, could pose a potential health problem to unsuspecting consumers: International Atomic Energy Agency.

**More on the News:**

- Radioactive materials or contaminated devices are entering into the booming scraps recycling chain, **posing a grave health hazard**, according to the annual data on illicit trafficking of nuclear and other radioactive material released by the **International Atomic Energy Agency (IAEA).**
- The latest data has been extracted from the IAEA Incident and Trafficking Database (ITDB), where some 143 member states and international agencies report **incidents of illicit trafficking of nuclear and other radioactive material** under or out of regulatory control.
- The **annual number of reported incidents of this kind over the last decade has averaged at around 131 incidents per year** according to the IAEA dataset.
- **Radioactive-laced waste products** — including vehicles like ships — is **being increasingly recycled without taking care of the hazard gains credence** from the fact that during 1993-2022, more than half of incidents reported under this group were not from radioactive sources.
- Only 10 per cent of all such incidents involved enriched uranium, plutonium and plutonium-beryllium neutron sources. Even for this, many incidents involved scrap metals with high enriched uranium landing up in scrapyards.
- The most **common source of such contamination is the feed material** (in most cases, metal) from which the product had been manufactured.
- Much feed material is often obtained from the metal recycling industry and, in the process of being melted down, can **become contaminated with material from an undetected radioactive source such as cobalt-60**.
- The resulting contaminated metal, **if used to manufacture household goods, could pose a potential health problem** to unsuspecting consumers.

## International Atomic Energy Agency

- Widely known as the world's "**Atoms for Peace and Development**" organization **within the United Nations family**, the IAEA is the international centre for cooperation in the nuclear field.
- The IAEA was **created in 1957** in response to the **deep fears and expectations generated by the discoveries and diverse uses of nuclear technology**.
- Headquarter: **Vienna, Austria.**
- **Objective:**
  - The Agency works with its Member States and multiple partners worldwide to **promote safe, secure and peaceful use of nuclear technologies**.
  - In 2005, it **was awarded the Nobel Peace Prize** for their work for a safe and peaceful world.
- **Board of Governors:**
  - **22 member states** (must represent a stipulated geographic diversity) — elected by the General Conference (11 members every year) – 2 year term.
  - At least 10 members states — nominated by the outgoing Board.
  - Board members each receive one vote.
- **Functions:**
  - It is an **independent international organization that reports annually to the United Nation General Assembly**.
  - When necessary, the IAEA **also reports to the UN Security Council** in regards to instances of members' non-compliance with safeguards and security obligations.

## 36. This winter most polluted for Maharashtra and Gujarat in last 4 years: CSE report

**Context:** The last winter (2022-23) turned out to be the most polluted one for Maharashtra and Gujarat in the previous four years, revealed a new analysis by the Delhi-based non-profit Centre for Science and Environment (CSE).

**More on the News:**

- The **average winter pollution level in the cities of Maharashtra rose by 13 per cent** compared to the mean of the previous three winter seasons. Winter pollution has been rising in Maharashtra on a yearly basis and stood at 66 micrograms per cubic meter (µg/m³) this winter, the study found.
- Winter pollution has been on a decline in Gujarat since 2019, but it spiked up this winter. In absolute terms, Gujarat was the more polluted of the two states, with a winter average of 73 µg/m3. **Gujarat registered an increase of 6 per cent compared to the mean of the previous three winters.**
- The **regional influence of pollution is sharply evident in the synchronised spread of winter pollution across the cities.**

**Analysis:**

- In these states, **winter pollution typically sets in during late November** and early December, when the cooler and calmer conditions trap local pollution.
- In the **western regions experience temperature inversion**, which occurs when the **surface temperature in the surrounding regions is lower than the air temperature**. As a result, **pollutants get trapped closer to the ground**, leading to a significant rise in PM 2.5 levels.
- Overall, **winter amplifies the effects of various sources of pollution**, including **industrial emissions, vehicular exhaust, and agricultural burning**, leading to a significant rise in PM 2.5 levels. The geographical phenomena, including **temperature inversion and the direction of the wind, play a crucial role in exacerbating the pollution levels** during winter in various regions of India.

Causes of Air Pollution in Delhi https://optimizeias.com/soon-delhis-air-pollution-sources-to-be-available-in-real-time/

## 37. European Union's collusion with fishing lobbies is damaging the Indian Ocean tuna

**Context:** Members of the Indian Ocean Tuna Commission (IOTC) agreed to reduce the use of drifting fish-aggregating devices (FADs) and to impose three-month closures on the devices, despite opposition from the European Union.

**More on the News:**

- The **EU dominates Indian Ocean tuna fisheries**; its fleet of industrial fishing vessels has long reeled in the lion's share of tuna, including yellowfin, a stock that is now perilously close to collapse.
- Through their numbers and influence in EU delegations, **industrial fishing lobbyists have stymied efforts to impose appropriate catch quotas and limit** the use of destructive fishing gear like FADs, an investigation by the French NGO BLOOM Association found.
- From 3rd to 5th February, IOTC members gathered in Kenya for a special session on the use of these fishing aids. At the meeting, **India pushed for a ban on drifting FADs**, saying it was necessary to **apply the precautionary principle** given the alarming state of yellowfin tuna. Another plan, backed by several major fishing nations, including the Maldives, Indonesia and India sought annual three-month drifting FAD closures. **It called for a steep cut to the number of devices a vessel** can deploy at any one time, from 300 to 150.

- Kenya abruptly rescinded its support for the plan at the start of the talks. BLOOM **accuses the EU of pressuring the East African nation to withdraw** by threatening to cut off funding for the country's Blue Economy program.
- In a statement, the **European Commission denied the NGO's allegations**, noting that the pandemic led to **increased participation from stakeholders** and that these stakeholders were observers and not authorized to negotiate on the commission's behalf.

## Indian Ocean Tuna Commission

- Indian Ocean Tuna Commission (IOTC) is an **intergovernmental organization** that was **established in 1993**.
- The Commission is **responsible for the conservation and management of tuna and tuna-like species in the Indian Ocean**, as well as the protection of the marine environment and the livelihoods of those who depend on these resources.
- **Membership:** The Commission has **23 Member countries and the European Union.**
- **Objectives**: The main objectives of the Commission are to **promote the sustainable use of tuna and tuna-like species**, to conserve the marine environment, to ensure the long-term sustainability of fisheries in the Indian Ocean, and to **promote the socio-economic development of the region.**
- **Functions**: The Commission carries out a range of functions, **including the collection and analysis of data on fish stocks and fishing activities**, the development of conservation and management measures, the **monitoring and control of fishing activities, and the promotion of scientific research.**
- **Conservation measures**: The measures include the **establishment of fishing quotas, the regulation of fishing gear, the protection of vulnerable species**, and the reduction of bycatch.
- **Monitoring and enforcement**: It include **vessel monitoring systems, observer programs, and port state control measures.**

## Tuna fish

- Tuna fish are a **group of large, fast-swimming, pelagic** (open ocean) fish found in the world's oceans. They are popular both as a game fish and as a food source.
- Tuna are a **rich source of omega-3 fatty acids**, which are essential for human health.
- They are also an important part of the marine ecosystem, serving as a **top predator and helping to regulate the populations of other species.**
- There are several species of tuna, including **skipjack, yellowfin, and bluefin tuna.**
- Bluefin tuna is the **largest and most prized species**, with some individuals growing to over 500 kg in weight. However, bluefin tuna populations have been **severely depleted due to overfishing**, and they are now **classified as endangered** by the International Union for Conservation of Nature (IUCN).
- Tuna **are migratory fish**, moving across vast distances in search of food and suitable breeding grounds.
- They are **found in all of the world's oceans**, from the tropics to the poles.


**38. India prepares for a domestic carbon market with release of a draft carbon trading scheme**
**Context:** India's carbon market is gradually taking shape with the latest push from the Ministry of Power which released a draft of the Carbon Credit Trading Scheme (CCTS).
**More on the News:**

- The carbon trading **scheme was introduced through the Energy Conservation (Amendment) Bill, 2022** which provides for empowering the central government to specify such a scheme.
- Though the establishment of a carbon or emission **market has been part of India's overall climate action strategy**, it has **gained momentum after the Conference of Parties (COP26) organised in Glasgow**. The concept of emissions trading is that countries sell excess emission units – emissions that they are permitted to have but not used – to other countries which need the excess units to meet their emission targets.

### Draft of the Carbon Credit Trading Scheme

- The draft of CCTS **lays out the organisational architecture** needed to set up and operationalise a domestic carbon market in India.
- It identified the **role composition of key constituents** – the **regulator (India Carbon Market Governing Board)**, the **administrator**, the **registry (the Grid Controller of India)**, the **trading administrator (Central Electricity Regulatory Authorit**y), exchanges and specifications for empaneling auditors and developing methodologies.
- The draft **proposes a structure for the Indian Carbon Market** (ICM), including a **voluntary trading and compliance market**. Secretaries and joint secretaries of several crucial ministries in union government will be part of the governing board, which will administer and regulate the market.
- According to the draft, the **proposed board will suggest policies and regulations for the market**, set up the **framework for voluntary carbon credit trading**, and specify criteria for selling carbon credit certificates to foreign buyers.
- Bureau of Energy Efficiency will be the **administrator for the Indian Carbon Market** and also **work as the secretariat for Indian Carbon Market Governing Board** (ICMGB).

- Bureau of Energy Efficiency will **discharge several responsibilities**, from developing standards and **processes for registering projects under a voluntary mechanism** to developing trajectories and targets for the entities under the compliance mechanism.
- The Bureau **will also issue carbon credit certificates** (CCC) and develop market stability mechanisms for carbon credits.
- The Bureau will **specify the procedure, including eligibility criteria for the accreditation of agencie**s to function as Accredited Carbon Verifiers.

Energy Conservation (Amendment) Bill, 2022 https://optimizeias.com/bill-to-set-up-carbon-credit-trading-passed/
Carbon Markets https://optimizeias.com/india-will-be-the-biggest-carbon-market-by-2030/

## 39. Estimating the potential of community forest rights

**Context:** Even after 16 years, implementation provisions under the Forest Rights Act, 2006, have been far from satisfactory. One of the many reasons for non-implementation is a **lack of clarity about where and how much forest land might be eligible for Community Forest Resource Rights (CFRR) claims.**

### More on the News:

- There is no "target" that state governments must reach and against which their performance can be measured in terms of recognising CFRR.
- Given the **complexity of land and forest settlement in India and the poor quality of land records and maps available**, generating an estimate of how much land could come under CFRR and where is not an easy task.
- A crude estimate can be made from village land **use data provided in the census' village amenities tables**. This pertains to the forest area within a village's revenue boundary.
- But an **estimate based on data from census tables is likely to be significantly lower than the actual are**a where communities traditionally exercised community rights, especially in central India.
- This is because **the process of forest "settlement" (notification and demarcation) followed in these states resulted in large tracts of forests being demarcated as Reserve Forest** (RF) and being **kept outside the revenue settlement**, thereby **not being part of any revenue village** and therefore not showing up in the census tables.
- These large RF patches have many settlements inside them, and of course have many more abutting or adjacent to them. Field data shows that residents of these villages (inside and adjacent to the forest area) were using these forests and exercising customary rights over them.

### Community Forest Resource rights

- The Community Forest Resource rights under Section 3(1)(i) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act (commonly referred to as the Forest Rights Act or the FRA) **provide for recognition of the right to "protect, regenerate or conserve or manage" the community forest resource**.
- These **rights allow the community to formulate rules for forest useby itself and others** and thereby discharge its responsibilities under Section 5 of the FRA.
- CFR rights, along with Community Rights (CRs) under Sections 3(1)(b) and 3(1)(c), which include nistar rights and **rights over non-timber forest products, ensure sustainable livelihoods of the community.**
- These rights **give the authority to the Gram Sabha to adopt local traditional practices** of forest conservation and management within the community forest resource boundary.

### Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

- **FRA** enacted in **2006** recognises the rights of **forest-dwelling tribal communities** and other traditional forest dwellers to forest resources on which these communities were dependent for a variety of needs, including livelihood, habitation and other socio-cultural needs.
- It recognizes and vests the forest rights and occupation in Forest land in **Forest Dwelling Scheduled Tribes (FDST)**and **Other Traditional Forest Dwellers (OTFD)** who have been residing in such forests for generations.
- It strengthens the conservation regime of the forests while ensuring the livelihood and food security of the FDST and OTFD.
- The **Gram Sabha**is the authority to initiate the process for determining the nature and extent of **Individual Forest Rights (IFR)** or **Community Forest Rights (CFR)** or both that may be given to **FDST** and

### Rights Under the Forest Rights Act:

- **Title rights:**
- It gives **FDST**and **OTFD** the right to ownership to land farmed by tribals or forest dwellers subject to a **maximum of 4 hectares.**
- Ownership is only for land that is actually being cultivated by the concerned family and no new lands will be granted.
- **Use rights:**
- The rights of the dwellers extend to**extracting Minor Forest Produce, grazing areas**
- **Relief and development rights:**

- To rehabilitate in case of illegal eviction or forced displacement and to basic amenities, subject to restrictions for forest protection.
- **Forest management rights:**
- It includes the **right to protect, regenerate or conserve or manage any community forest resource** which they have been traditionally protecting and conserving for sustainable use.

## 40. Micrixaluskottigeharensis

**Context:** Malformations such as a missing eye or deformed limb have been noted in the Kottigehar dancing frog, possibly due to anthropogenic stressors.

### Kottigehar dancing frog (Micrixaluskottigeharensis)

- Micrixaluskottigeharensis is a **species of frog found in the Western Ghats of India**. It belongs to the genus Micrixalus in the family Micrixalidae.
- The species was first discovered in 2012 in Kottigehara, a **small town in the Western Ghats of Karnataka**. It is known to inhabit rocky streams in the vicinity of evergreen forests.
- Micrixalidae is **one of the oldest families of frogs** in the Western Ghats, and is known to have evolved more than 60 million years ago and diversified five million years ago.
- The genus, Micrixalus, commonly known as "**dancing frogs**", represents an ancient lineage and certain studies have indicated that the **lineage has no close living relatives**.
- Micrixaluskottigeharensis is a small frog, with adult males measuring about 20-25 mm in length, and females being slightly larger at 30-32 mm.
- The frog has a unique call, which sounds like the chattering of a bird, and is used to attract mates during the breeding season.
- Micrixaluskottigeharensis is threatened by **invasive species like the mosquito fish**, land use change, variation in temperature and humidity, extreme weather events such as **floods and excess rainfall,** infectious diseases, water pollution, light pollution, and infrastructure projects such as dams.
- **Conservation status**
  - It is listed as **Endangered** on the **IUCN Red List.**
  - The species is **not listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix.**
  - In India, the species is **not protected by the Wild Life Protection Act, 1972**, as there isn't adequate information about its distribution and numbers.

## 41. Socioeconomic inequality as the biggest problem behind water shortages in urban areas

**Context:** Swimming pools and manicured lawns — rich communities' extravagant choices are leaving too little water for the poor
**More on the News:**

- Extravagant habits of the wealthy elite, like swimming pools, well-maintained lawns and regularly washed cars, are **depriving poorer communities of basic water access**, a new study has found.
- Socioeconomic inequalities **could be driving urban water crises** as much as factors like climate change or population growth in cities.
- The **richest 13.7 per cent of people** used more than **51 per cent of the water consumed** by the entire city, the study found. **Informal dwellers and lower-income households together constitute about 61.5 per cent of Cape Town's population** but **consume 27.3 per cent of the city's water.**
- **The elite households** in Cape Town **used 2,161 litres of water per day**, according to the study. The water consumption of **upper-middle-income households** reached about **78 litres per day**. On the other hand, **lower-income** families use **only 178 litres per day** and informal households consume 41 litres a day.
- The **crisis could worsen still as the gap between the rich and the poor widens** in many parts of the world, the study said.
- The researchers also said **increased use of private boreholes in times of shortage by the richest citizens** substantially depleted groundwater resources.
- About 2.4 billion people worldwide living in cities could face water shortages in 2050, up from 933 million people in 2016, according to a United Nations report.
- The study confirms the **only way to preserve available water resources is by altering privileged lifestyles**, limiting water use for amenities and redistributing income and water resources more equally.
- **Reorienting current water management and drought adaptation policies** towards new political-economic paradigms to prevent overconsumption and inequalities was also suggested by the study.

## 42. New frog species found in Meghalaya Siju cave

**Context:** A team of researchers from Zoological Survey of India found Amolopssiju in Siju cave in 2020
**More on the News:**

- The newest croaker recorded in India is a **dark cave dweller**, unlike most members of the Ranidae family belonging to Amolops, a genus of true frogs.
- Scientists from the Shillong and Pune units of the **Zoological Survey of India** (ZSI) have **named the new species Amolopssiju after the Siju cave system of Meghalaya**, from where four specimens were collected. Two of them, including a gravid female, were found in a dark zone of the cave near a chamber of bats.
- This is the **second cave-dwelling species of frog recorded from India after Micrixalusspelunca in Tamil Nadu** nine years ago.

## Amolopssiju

- It has been **named after the Suji cave** where it was discovered.
- It belongs to the **cascade Ranidae family** and genus Amolops.
- Genus Amolops is **among the largest groups of ranid frogs** (family Ranidae) with 73 known species widely distributed across India's North East and north, Nepal, Bhutan, China, the Indochina region and the Malaya Peninsula.
- Cascade frogs are named so **because they prefer small waterfalls.**
- The Amolopssiju is a **relatively small frog**, with a length of **around 2.5 cm.**
- It is **brown in colour** and has a narrow snout. The frog is a **semi-aquatic species** and is found in the streams that flow inside the Siju Cave.

## Suji caves

- Siju Cave, also known as **Bat Cave**, is a cave located in **Meghalaya**, India.
- It is the **third longest natural cave** in the Indian subcontinent and is famous for its large bat population.
- It is a 4 km long **natural limestone cave**.

## Zoological Survey of India

- Zoological Survey of India (ZSI) is an organization **under the Ministry of Environment, Forest and Climate Change**, Government of India.
- It was established in **1916** and is **headquartered in Kolkata, West Bengal**.
- ZSI has **regional centers located** in various parts of India, including Andaman & Nicobar Islands, Port Blair, Dehradun, Jabalpur, Pune, Shillong and Kolkata.
- It also has a **Marine Biology Regional Centre located in Chennai, Tamil Nadu**.
- The primary objective of ZSI is to **promote the survey, exploration, research and documentation** on various aspects of animal taxonomy in the Indian subcontinent.
- It also **provides expert advice and assistance to the Central and State Governments** in matters related to conservation of wildlife and forests.
- Some of the key functions of ZSI include:
  - **Conducting surveys and collecting data** on the distribution, abundance and status of various animal species in India.
  - **Identifying and classifying newly discovered animal species** and conducting taxonomic studies.
  - **Developing and maintaining a National Zoological Collection**, which comprises specimens of animal species found in India.
  - **Undertaking research on animal taxonomy**, ecology, biogeography and biodiversity conservation.
  - **Providing expert advice** to the Government on wildlife and biodiversity conservation issues.
  - **Collaborating with other national and international organizations** involved in wildlife and biodiversity conservation.

## 43. Sewage overload: Why the Ganga remains polluted despite cleanliness drives

**Context:** At least 71% of the river's monitoring stations reported alarming levels of faecal coliform in January 2023.
**More on the News:**

- Union minister of state for Jal Shakti told the Parliament that the **NamamiGange Programme** has been **able to reduce pollution load in the Ganga river**. Since 2014, the Centre had taken up 409 projects with a budget outlay of Rs 32,912.40 crore to clean up the river.
- Still, at least 71 per cent of the river's monitoring stations reported alarming levels of faecal coliform. Faecal coliforms are a **group of bacteria** found in the **gut and faeces of warm-blooded animal** Their presence **indicates that the water has been contaminated with the faecal material of humans or other animals**, which enters rivers through discharge of untreated sewage.
- While **Uttarakhand had permissible levels of faecal coliform** at all 12 tested stations, numbers in three other states — Uttar Pradesh, Bihar and West Bengal — are alarming.
- CPCB currently carries out manual monitoring for **five parameters**, including faecal coliform. In 2022, the river had permissible levels for two of the parameters: **Dissolved oxygen and acidic or pH levels.**

- The current monitoring mechanism needs to be more ambitious. The five parameters monitored at present are part of the notified Environment (Protection) Amendment Rules, 2000. The Centre released of two guidelines in 2007 and 2017 which **recommed 25 parameters for perineal rivers.**

**NamamiGange Programme:**

- It is an Integrated Conservation Mission, approved as a '**Flagship Programme'** by the Union Government in June **2014** with a budget outlay of Rs.20,000 Crore to accomplish the twin **objectives of effective abatement of pollution, conservation, and rejuvenation of the National River Ganga.**
- It is dynamic and evolving in nature to address the emerging needs and priorities for the rejuvenation of river Ganga & its tributaries.
- It is being operated **under the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti**.
- The program is being **implemented by the National Mission for Clean Ganga** (NMCG), and its state counterpart organizations i.e State Program Management Groups (SPMGs).
- NMCG is the **implementation wing of National Ganga Council** (set in 2016; which replaced the National Ganga River Basin Authority – NGRBA)
- The **main pillars** of the NamamiGange Programme are
  - Sewerage Treatment Infrastructure
  - River-Front Development
  - River-Surface Cleaning
  - Bio-Diversity
  - Afforestation
  - Public Awareness
  - Industrial Effluent Monitoring
  - Ganga Gram

**National Ganga Council:**
**What is National Ganga Council:**

- The National Ganga Council is an authority created in October 2016 under the **River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016,** dissolving the National Ganga River Basin Authority.
- Compositions:
  - The National Ganga Council is **chaired by the Prime Minister.**
  - **Union Minister for Water Resources,** River Development and Ganga Rejuvenation will be the **ex-officio Vice-Chairperson.**
  - The other ex-officio members of the council are from various ministries and CMs of the corresponding states among other stakeholders.
- The National Ganga Council was formed under the **Environment (Protection) Act (EPA),1986.**
- It has been given **overall responsibility** for the superintendence of pollution prevention and rejuvenation of River Ganga Basin, including Ganga and its tributaries.
- **National Mission for Clean Ganga**(NMCG) acts as an **implementation arm of the National Ganga Council.**
- It was **established in the year 2011** as a registered society.
- It has a **two-tier management** structure and comprises **Governing Council and Executive Committee.**

**44. G7 Ministers commit to move to carbon-free power by 2035**

**Context:** A proposal to have a 2030 deadline for phasing out coal was shot down and the final text gives leeway for continued investment in gas, on the grounds that it could be a stopgap against energy shortfalls.
**More on the News:**

- Climate and Energy Ministers and envoys from Group of Seven (G7) countries **committed to work towards ensuring carbon-free electricity** production by 2035 and **"accelerating" the phase-out of coal**. This was part of an agreement by the countries at the end of a two-day conference in **Sapporo, Japan**, ahead of the **G7 summit in Hiroshima this May.**
- A proposal to have a 2030 deadline for phasing out coal was shot down and the final text gives leeway for continued investment in gas, on the grounds that it could be a stopgap against energy shortfalls, Reuters reported.
- At the **United Nations-Conference of Parties** (COP) meeting in Glasgow in 2021, India had **objected to language in the agreement to "phase out"** and pushed **instead for a "phase down" of coal**.
- At the COP meeting in Sharm el Sheikh last year, **India pushed for a proposal to phase out all fossil fuel sources, including coal and gas**. India and China are significantly dependent on coal for electricity, whereas several developed countries, including the **United States, Japan, Canada and Europe are reliant on gas reserves.** The latter however **didn't find mention in the final text of the Sharm el Sheikh agreement**.
- The G7 nations account **for 40% of the world's economic activity** and a **quarter of global carbon emissions.** Their actions are critical, but so is their **support for less wealthy nations often suffering the worst effects of climate change** while having the fewest resources for mitigating such impacts.

- Emissions in advanced economies are falling, though historically they have been higher — the **United States alone accounts for about a quarter of historic global carbon emissions** — while **emerging markets and developing economies now account for more than two-thirds** of global carbon emissions
- The president-designate for the next United Nations climate talks, the COP28, who was also attending the talks in Sapporo, issued a statement **urging G7 nations to increase financial support for developing countries' transitions to clean energy**.

## 45. Rhino poaching suspect's body found in river; police say he jumped in to escape

**Context:** Three weeks after Assam's first rhino poaching case in more than a year was discovered in Kaziranga, the body of the suspected poacher was found floating in the Brahmaputra on Sunday

- It is located in the State of Assam and covers 42,996 Hectare (ha). It is the single largest undisturbed and representative area in the Brahmaputra Valley floodplain.

**Status of the National park**:

- It was declared as a National Park in 1974.
- It has been declared a tiger reserve since 2007. It has a total tiger reserve area of 1,030 sq km with a core area of 430 sq. km.
- It was declared a **UNESCO World Heritage Site** in 1985.
- It is recognized as an **Important Bird Area by Bird Life International**.

**Important Species Found:**

- It is the **home of the world's most one-horned rhinos**. Pobitora Wildlife Sanctuary has the highest density of one-horned rhinos in the world and second highest number of Rhinos in Assam after Kaziranga National Park.
- Much of the focus of conservation efforts in Kaziranga are focused on the 'big four' species— Rhino, Elephant, Royal Bengal tiger and Asiatic water buffalo.
- Kaziranga is also home to 9 of the 14 species of primates found in the Indian subcontinent.

**Rivers and Highways:**

- The National Highway 37 passes through the park area.
- The park also has more than 250 seasonal water bodies, besides the Diphlu River running through it.

**Other national parks in Assam are**:

- Dibru-Saikhowa National Park,
- Manas National Park,
- Nameri National Park,
- Rajiv Gandhi Orang National Park.
- Rhinos are listed in **Schedule 1 of Wildlife (Protection) Act, 1972** as an endangered animal and there is an international ban on trade of rhino horns under **CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna).**
- Three species of rhino—**black, Javan, and Sumatran**—are critically endangered.
- Today, a small population of Javan rhinos is found in only one national park on the northern tip of the Indonesian island of Java.
- A mainland subspecies of the Javan rhino was declared extinct in Vietnam in 2011.
- Successful conservation efforts have led to an increase in the number of greater one-horned (or Indian) rhinos, from around 200 at the turn of the 20th century to around 3,700 today.
- **Indian Rhino Vision 2020**
- Launched in 2005, Indian Rhino Vision 2020 is an ambitious effort to attain a wild population of at least 3,000 greater one-horned rhinos spread over seven protected areas in the Indian state of Assam by the year 2020.
- Seven protected areas are Kaziranga, Pobitora, Orang National Park, Manas National Park, Laokhowa wildlife sanctuary, Burachapori wildlife sanctuary and DibruSaikhowa wildlife sanctuary.
- It is a collaborative effort between various organisations, including the International Rhino Foundation, Assam's Forest Department, Bodoland Territorial Council, World Wide Fund – India, and the US Fish and Wildlife Service.

## 46. Wild Water Buffaloes

**Context:** The love for momos in Nepal is threatening endangered wild water buffaloes
**More on the News:**

- Dumplings (momos) filled with buffalo meat are popular in Nepal. They command a higher price if the **meat comes from a crossbreed of wild and domestic buffalo**.
- Crossbreeding domestic and endangered wild buffaloes is **illegal and can threaten the wild populatio**n, but people do it **because of the high demand** for the meat as well as a belief that crossbred females produce more milk.

- People from India too sometimes leave their domestic water buffaloes out in the open near the **KoshiTappu Wildlife Reserve** in eastern Nepal, the country's last remaining habitat for wild buffaloes, with the hope of crossbreeding with wild buffaloes.
- Authorities in **the KoshiTappu Wildlife Reserve** are **challenged with controlling the mixing of wild and domestic animals inside the reserve**.

## Wild Water Buffaloes:

- Wild water buffaloes, also known as Asiatic water buffaloes, are **large bovine animals that are native to the Indian subcontinent** and Southeast Asia. They are one of the two species of buffalo that exist, the other being the domesticated water buffalo.
- Wild water buffaloes **prefer swampy and marshy habitats**, such as grasslands, reed beds, and forests, near rivers, lakes, and other water bodies.
- They are typically found in areas with **warm and humid climates**, including India, Nepal, Bhutan, Bangladesh, and Southeast Asia. In India, wild water buffaloes are **found in the northeastern states of Assam, Arunachal Pradesh, and Meghalaya.**
- Wild water buffaloes are **large and stocky animals** that can weigh up to 1200 kg. They have a **dark brown or black coat** that is coarse and sparse, with tufts of hair on their head and neck. They also have large, **curved horns that can span up to 2 meters**. Wild water buffaloes are **excellent swimmers and can move easily through water**.
- Wild water buffaloes are **social animals** that live in herds of up to 30 individuals, typically **led by a dominant male.** They are mostly active at dawn and dusk and spend most of their day resting and feeding. They are **herbivores** and primarily feed on grasses, aquatic plants, and other vegetation. Wild water buffaloes are also known to wallow in mud and water, which helps them regulate their body temperature and avoid parasites.
- **Threats**: Wild water buffaloes are threatened by h**abitat loss and fragmentation due to human activities**, such as agriculture, infrastructure development, and logging. They are also at **risk of poaching** for their meat, horns, and other body parts. In addition, they are **vulnerable to diseases**, such as bovine tuberculosis and foot-and-mouth disease, which can be **transmitted by domestic cattle**.
- The population of wild water buffaloes in India is estimated to be around 3,400 individuals, with the **majority of them living in Assam.**
- The wild water buffalo **is listed as endangered on the IUCN Red List.**
- **Conservation**: Several conservation programs are in place to protect wild water buffaloes, including the Indian **Wildlife Protection Act**, which **prohibits hunting and trade of wild water buffaloes** and their products. **International Union for Conservation of Nature (IUCN) and the Wildlife Conservation Society (WCS)**, are working to establish protected areas and captive breeding programs for wild water buffaloes.

## 47. Mangrove Pitta Birds

**Context:** First-ever census finds 179 mangrove pitta birds in two coastal Odisha districts.
## More on the News:

- Mangrove pitta birds are a nearly threatened species found in few pockets of eastern India, including **Odisha's Bhitarkanika and West Bengal's Sundarbans.**
- The first census of mangrove pitta ( Pitta megharencha) birds **was mainly focused on the mangrove patches all along the coasts** of Kendrapara and Jagatsingpur districts.
- The birds were counted by direct sighting and from their chirping.

## Mangrove Pitta Birds

- Mangrove Pitta is a species of bird that is **endemic to the mangrove forests** of South and Southeast Asia.
- **Scientific name**: Pitta megarhyncha
- The Mangrove Pitta inhabits mangrove forests **along the coast and in the deltas of Southeast Asia**. It is found in countries such as India, Bangladesh, Myanmar, Thailand, Malaysia, Indonesia, and the Philippines.
- The Mangrove Pitta has a **bright blue head and neck**, with a **black mask that extends from the eyes to the nape**. Its upperparts are green, while its underparts are yellow. It has a long and strong bill that is used to dig for insects in the mud.
- The Mangrove Pitta is a **shy and elusive bird** that is often heard before it is seen. It **feeds on insects, crustaceans, and molluscs**, which it finds by probing the mud with its bill. It is a **solitary bird** that is often found in pairs during the breeding season.
- Mangrove Pitta is an important **indicator species** of the health and biodiversity of mangrove ecosystem.
- Threats: Mangrove pittas are threatened by **habitat loss due** to deforestation, **conversion of mangroves to aquaculture ponds**, and urbanization. They are also **hunted for food and trapped for the pet trade.**
- **Conservation status**: The Mangrove Pitta is listed as **Near Threatened** on the IUCN Red List.

Bhitarkanika National Park https://optimizeias.com/bhitarkanka-national-park-2/

**48. Great Pacific Garbage Patch**

<u>Context:</u> In the Great Pacific Garbage Patch, coastal life piggybacks on plastic trash.

<u>**What is the Great Pacific Garbage Patch?**</u>

- There are some **water currents in the oceans that, driven by winds and the Coriolis force,** form loops. These are **called gyres.**
- The North Pacific Subtropical Gyre (NPSG) is one such, **located just north of the equator in the Pacific Ocean.** It consists of the Kuroshio, North Pacific, California, and North Equatorial currents and moves in a clockwise direction. These currents flow adjacent to 51 Pacific Rim countries. Any trash that enters one of these currents, from any of these countries, could become part of the gyre.
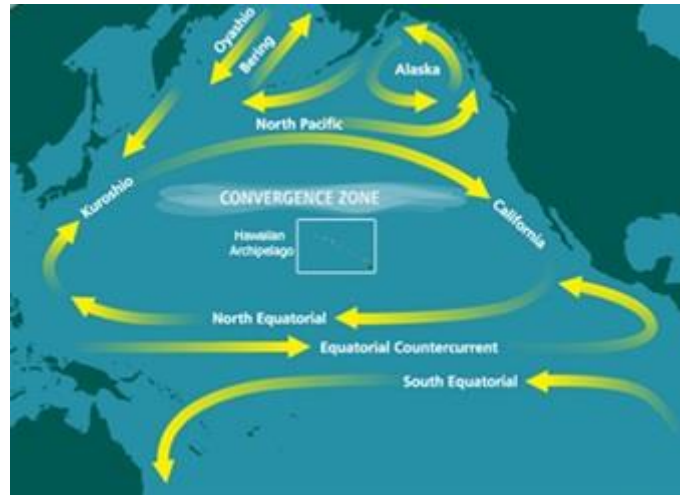


- Inside this gyre, just north of Hawaii, lies a **long east-west strip where some of the debris in these currents has collected over the years**. The eastern part of this is the Great Pacific Garbage Patch. It is, per one estimate, **6 million sq. km big** and more than **50 years old.**
- The patch contains an **estimated 45,000-1,29,000 metric tonnes of plastic**, predominantly in the form of microplastics. The **numerical density of plastics here is around 4 particles per cubic metre**. Mass-wise, however, heavier, more visible objects that haven't yet broken down into smaller particles accounted for 92% in 2018.

<u>**What did the new study find?**</u>

- The **tsunami off the Japanese coast in 2011 contributed to the debris** in this garbage patch. Until at least 2017, researchers had found debris washing ashore on the West coast of North America containing live lifeforms originally found in Japan.
- From November 2018 to January 2019, researchers collected 105 pieces of plastic debris from the eastern part of the NPSG, "the most heavily plastic-polluted ocean gyre on the globe"
- Based on studying them, they reported that **98% of the debris items had invertebrate organisms**. They also found that **pelagic species** (i.e. of the open ocean) **were present on 94.3% of them** and **coastal species, on 70.5%.** That is, organisms found on coasts were getting by on small floating islands of garbage (to humans) out in the Pacific Ocean.
- The number of coastal species such as a**rthropods and molluscs identified rafting on plastic** was over three-times greater than that of pelagic species that normally live in the open ocean
- In all, they found organisms belonging to 46 taxa, and 37 of them were coastal; the rest were pelagic. **Among both coastal and pelagic organisms, crustaceans were the most common**. The coastal species were most commonly found on fishing nets whereas the pelagic species, on crates.

<u>**What do the findings mean?**</u>

- The researchers have written in their paper that "the **introduction of a vast sea of relatively permanent anthropogenic** rafts since the 1950s" has **given rise to a new kind of "standing coastal community** in the open ocean". They've named it the **neopelagic community**.
- They write in their paper that while **coastal species have been found on human-made objects in the open ocean before, they were always considered to have been "misplaced" from their intended habitats**. The **neopelagic community**, on the other hand, is not misplaced **but lives on plastic items in the garbage patch, including reproducing there.**
- The finding recalls a study published on April 3, in which researchers reported that **polyethylene films had chemically bonded with rocks in China** – which is reminiscent, in turn, of the "**anthropoquinas**" of Brazil (**sedimentary rocks embedded with plastic earrings**) and the "**plastiglomerates**" of Hawai'i (**beach sediment + organic debris + basaltic lava + melted plastic**).

<u>**Aquatic Zones**</u>

- The **littoral zone** is the **shallow water near the shore**. In the ocean, the littoral zone is also called the intertidal zone.
- The **pelagic zone** is the **main body of open water farther out from shore**. It is divided into additional zones based on water depth.
  - In the ocean, the part of the pelagic zone over the continental shelf is called the **neritic zone,** and the rest of the pelagic zone is called the **oceanic zone.**
- The **benthic zone** is the **bottom surface of a body of water**. In the ocean, the benthic zone is divided into additional zones based on depth below sea level.
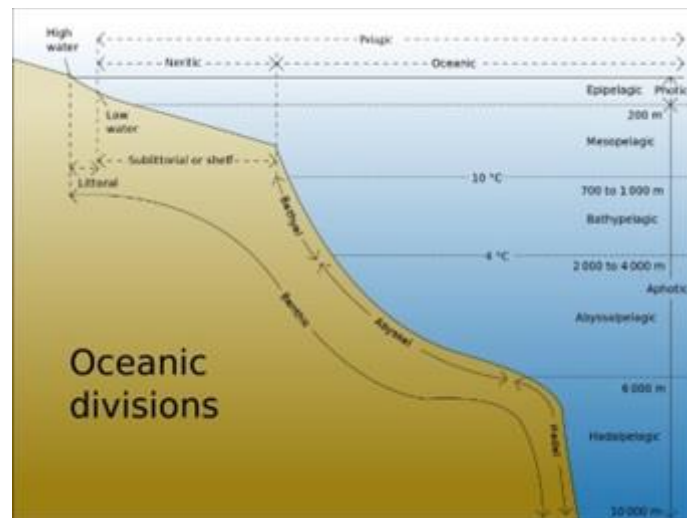


## 49. Can we democratize tiger conservation in India

**Context:** Scientists were happy Project Tiger was able to hold on to tiger populations. The 2023 preliminary report finds that this hold is slipping.

**More on the News:**

The tiger number released and the minimum estimate based on the tigers photographed during the survey. The final estimates will come in the next few months; authorities have **indicated a 6% annual growth rate**, so the expected number would be approximately 25-30% above the previous 2018-2019 estimate of 2,967 tigers.

Many scientists, while not impressed by the figures, were happy that **Project Tiger was able to hold on to tiger populations in most of the geographical regions where they existed** at its inception.

However, in the 2023 preliminary report, for the first time, finds that this hold is slipping away. N**ow losing tigers from Jharkhand, Chhattisgarh, and the Eastern ghats** and **from the Northeastern forests**. With it, **lose genetic diversity unique** to these geographical regions, dashing hopes of **maintaining long-term population viability and natural recovery.**

**Challenges in Tiger Conservation Approach:**

- **Reintroduction of Tigers:** A tool that is increasingly being used is to reintroduce tigers from central Indian forests, where the populations are thriving, as was done for the Panna and the **Sariska Tiger Reserves**. However, **if this is done too often, re-introduction will homogenise tiger genetic structure** across the country.
- **Absence of proper scientific oversight:** therefore, focus stayed on boosting tiger numbers rather than their habitat and concomitant species.
- **Manipulating ecosystems**: the most common interventions were to manipulate ecosystems so that they could **support high densities of the tiger's principal prey species**. In most cases, this **involved improving habitat for cheetal**, a mixed feeder that thrives in the "ecotone" between forests and grasslands.
  - For example, in the **Kanha Tiger Reserve,** the **explosion in the cheetal population resulted in the habitat becoming unsuitable** for the endangered hard ground **barasingha**, which depends on tall grass. Managers then **had to create exclosures free of cheetal** so that the **barasingha** could reproduce, and their numbers recover.
- **Excessive provisioning of water**: during the dry season tends to **reduce natural, climate driven variations** in populations of wildlife. This is likely to have **unknown and unintended consequences** for these habitats in the long-term.
- **Policy issues**:
  - Conservation in India **depends entirely on a network of Protected Areas** (PAs). This is an exclusive conservation model and suffers from a " sarkaar" complex.
  - **WLPA is a restrictive law**. It describes in **great detail what you can't do**. However, the law and associated policies have done very little to enable conservation.
  - There is **no policy framework and incentive for ordinary citizens** to aid in **conservation** – be it for tigers or for any other species. As a result, conservation has not reached beyond these PAs.

**Suggestions:**

- Have **frameworks that allow local communities, citizens, scientists, non-governmental organisations, and businesses to participate** meaningfully in conservation.
  - For example, large tracts of forest land are "Reserved Forests" under the jurisdiction of the "territorial" wing of State Forest Departments. Such areas can be co-managed with an approach that is inclusive and provides economic benefits for local communities.
- **Vision document that examines** these figures critically and provides a way forward for the next 20 years.
- In many landscapes**, degraded agricultural lands adjoining these forest areas can be restored to enhance connectivity** between Protected Areas.

## 50. Climate Change and Coastal erosion

**Context:** Left with just 11 inhabitants, a village caught between climate change and sea
**More on the News:**

- Since 2007, when the marauding sea started making swift advances to reclaim land. Over 500 families deserted the Podampeta village, condemning the once-thriving hamlet to a deserted shadow of its former self. Once home to over 1,500 fisherfolk, it is currently **inhabited by just 11 persons belonging to the two remaining families**, one of them Paindi's.
- Podampeta**lies quiescent on the shores of the Bay of Bengal**, near the mouth of Rushikulya river.
- According to **Odisha's climate change action plan**, made by its Forest and Environment Department, of the coast length of 480 km, nearly 187 km is exposed to erosion and considered stable; 39.3 km falls in the high-erosion zone; while 51.96 km has been designated as falling in the medium-erosion zone.
- The **action plan emphasized Odisha's particular vulnerability to the impact of climate change in the form of rise in sea levels** and increased intensity of storms. Loss of land to sea has become a more recurrent and frequent phenomenon.
- According to a study on 'Shoreline Change Along Odisha Coast', published in the Journal of Earth System Science in 2021, **coastal structures such as sea walls, breakwaters and jetties result in modification of the shoreline and beach morphology**.
- Construction of hard structures along the coast, either for development of ports and harbours significantly modifies the shoreline. Besides, natural hazards such as tsunami and cyclone storms along the Indian coast have resulted in significant changes in the shoreline. It said that along the east coast of India, Odisha is most prone to cyclones. Cyclones along the Odisha coast **cause severe damage to coastal life and coastal structures.**

Causes of Coastal erosion https://optimizeias.com/beaches-in-visakhapatnam-are-now-heading-towards-a-disaster-say-experts/
**Integrated Coastal Zone Management: https://optimizeias.com/coastal-crisis/**
**New Policy to help displaced Communities https://optimizeias.com/new-policy-to-help-indian-communities-displaced-by-annual-river-coastal-erosion-drafted/**

## 51. Finding gondra amid the floods

**Context:** Sahariyaadivasis **gather and treat a river sedge called 'gondra'**, the roots of which are used in manufacturing perfume. The Sahariyas rely on gondra for subsistence.
**More on the News:**

- Sahariyas living in Madhya Pradesh on the banks of Sindh river were impacted by a flash flood in August 2021 and other subsequent weather events.
- Changes in the river's ecology and climate impact the accessibility of gondra, and consequently the livelihoods of one of the most vulnerable communities in India.

### River Sedge (Gondra)

- River sedge, locally called 'gondra', is **a grass-like plant species** that grows in the **riverine plains of the Himalayan region**.
- It belongs to the Cyperaceae family and is **found in the foothills of the Himalayas**, in states like Uttarakhand, Uttar Pradesh, Bihar, and West Bengal.
- It is used by **local communities for weaving traditional baskets**, mats, and other handicrafts, and is an **important source of livelihood for them**.
- The sedge is also **used for making ropes, for thatching roofs**, and as a **biofencing material**.
- The **plant is drought-resistant** and can grow on sandy and moist river banks.
- Gondra is a **medicinal plant** that is **used in Ayurvedic cures** in dry or powdered form. The **essential oil (0.5-0.9%) from the tuber** is used in perfumery, soap making and in insect repellents. The r**aw material that remains after extracting the oil is used for making the body of incense sticks.**
- Additionally, some species of gondra are **used for soil stabilization and phytoremediation of contaminated sites.**

### Sahariya Tribe

- Sahariyas are a **tribe living in the border regions** of Rajasthan and Madhya Pradesh in India.

- They are classified as **particularly vulnerable tribal groups**.
- The Sahariya community **considers every adult member part of a governing council** which is headed by a patel.
- The Sahariyas are **expert woodsmen and forest product gatherers**.
- They are **particularly skilled in making catechu** from Khair trees.

## 52. KFRI on a clear-the-air campaign for bats

**Context:** The institute is on a mission to dispel myths associated with bats and create awareness of their diversity, ecosystem functions, threats faced by the flying mammals.

**More on the News:**

- Bats have been cloaked in superstition since ancient times. Their nocturnal nature and spooky appearance place them in horror stories.
- KFRI Director launched a social media campaign 'Bat for Bats' at the institute recently as part of International Bat Appreciation Day. KFRI plans to conduct awareness programmes about bats in schools, colleges, and for the public
- KFRI, says the public is largely unaware of the economic and environmental benefits that bats provide to humans.
- At least eight bats in Odisha's Jajpur district **died as a heatwave swept across the state**, compelling forest officials to **spray water to maintain temperatures** and hydrate the remaining bats to help them survive.
- Scientists and experts fear that the **increase in temperatures and frequency of heat waves due to climate change** may result in a **mass population collapse**.
- A large number of bats dying from heatwaves may also **lead to ecological imbalances and increased spread of zoonotic diseases.**

**Bats:**

- Bats are the **only mammals capable of sustained flight**.
- They belong to the order **Chiroptera**, which means "hand-wing" in Greek.
- There are over 1,400 species of bats, comprising around **20% of all mammal species**.
- Bats are found worldwide, **except in the polar regions and some isolated islands**.
- **Ecological Significance:**
- **Seed dispersal**– The diet of fruit-eating bats consists largely of flowers and fruits such as mangoes, bananas, guavas, custard apples, figs, tamarind and many species of forest trees.
- **Pollination**– Studies have found that bats play a vital role in pollination, mainly of large-flowered plants, and in crop protection.
- **Production boost**– Some large insectivorous bats are also reported to feed on small rodents.
- **Soil fertility**– Bat droppings provide organic input to soil and facilitate nutrient transfer, contributing to soil fertility and agricultural productivity.
- **Health benefits**– contribute to human health by reducing populations of mosquitoes and other insect vectors that spread malaria, dengue, chikungunya and other diseases.

**Threats**

- Anthropogenic factors such as **habitat loss, poaching, environmental pollution**, climate change, and **biological invasions** have caused the decline of bat population worldwide.
- Due to their **low reproductive rate, gregarious lifestyle**, and high metabolic rate, most bat species cannot withstand anthropogenic pressures.

## 53. Carbon Offset

**Context:** Offsets have come under fire as a way for companies to compensate for carbon emissions through eco projects elsewhere.

**How does offsetting work?**

- Buying offsets is a **way to "compensate" for environmental damage**. Companies make a **financial contribution to projects that reduce the amount of carbon dioxide** in the atmosphere, and in exchange can keep polluting themselves.
  - Examples of projects include planting trees and rewetting peatlands — which store huge amounts of carbon in their soil.
- In recent years, the carbon offset industry has boomed. It is **worth $2 billion** (€1.87 billion) annually and is expected to grow five times that size by the end of the decade.
- After the concept's invention in 1987, some international treaties such as the **Kyoto protocol have let industrialized countries use carbon credits**, each of which is worth one ton of carbon, to keep within emissions limits. That market – — where carbon credits are traded to meet government regulations — is much bigger, about $261 billion a year.

**Offsetting in practice**

- Offset projects can be broadly split into two categories: **removals and avoidances**.

- Removal describes actions which **actively take carbon out of the air and store it permanently**, such as **by planting trees or direct air capture** — which is not a technology available at scale. Currently **carbon dioxide removal** represents just a small percentage of the carbon credits in circulation.
- **Avoidance offsets** are from projects that **stop the release of greenhouse gases**, such as protecting trees from being logged.

## Problems with Carbon offsetting:

- **Additionality:** Additionality refers to the idea that carbon offset projects **should only be considered legitimate if they result in reductions in greenhouse gas emissions** that would not have occurred in the absence of the project. However, it is **difficult to determine whether a project is truly additional** and **whether the emissions reductions would have occurre**d anyway without the offset project.
- **Permanence:** Carbon offsetting projects such as **reforestation, afforestation, or carbon sequestration can be reversed if the trees are cut down, wildfires occur**, or soil carbon is released. This means that carbon offsetting is not a permanent solution and cannot guarantee long-term emissions reductions.
- **Leakage:** Leakage refers to the situation where **emissions are shifted from one location to another as a result of a carbon offsetting project**. For example, a forestry project may lead to deforestation in another area, or a renewable energy project may lead to higher emissions from other energy sources due to increased demand.
- **Verification**: There is a **lack of standardized and transparent verification mechanisms** for carbon offsetting projects. It is difficult to ensure that the projects are genuinely reducing emissions and that the credits generated are not being double-counted or sold more than once.
- **Ethical concerns:** There are concerns about the ethics of carbon offsetting, particularly when it **comes to projects that involve land acquisition** or that may have **negative impacts on local communities or biodiversity.**

## 54. White Tiger

**Subject: Environment**
**Section: Species in news**
**Context:** White tiger cubs Avani& Vyom released for public viewing at Delhi Zoo.
## White Tiger:

- The white tiger or bleached tiger is a **leucistic pigmentation variant** of the Bengal tigers, Siberian Tiger and man-made hybrids between the two
- They are **reported in the wild** from time to time in the Indian states of **Madhya Pradesh, Assam, West Bengal, Bihar and Odisha** in the Sundarbans region and especially in the former State of Rewa.
- Such **a tiger has the black stripes typical of the Bengal tiger**, but carries a white or near-white coat.
- The **first white tiger was spotted in Madhya Pradesh's** Vindhya region, in which the Satna district falls, in 1915.
- The rare breed of the big cat, which was caught for the first time, died in 1920.

## 55. Wind, solar cleaner for energy transitions than other renewables

**Context:** Clean energy coalition of WWF, IRENA says shift to renewable energy must protect nature; all forms of renewable power are better than fossil fuels.
## Findings:

- A **transition to Net Zero** by **scaling up wind and solar energy** projects would be **significantly less damaging** than other renewable pathways, stated a new report by non-profit World Wide Fund for Nature (WWF) and intergovernmental organisation International Renewable Energy Agency (IRENA).
- **Adopting the right mix of low-carbon technologies** to meet energy demand can help **stabilise global temperatures and protect ecosystems**, noted the document by Coalition Linking Energy and Nature for action (CLEANaction).
- Construction of other renewable energy projects, such as **hydropower dams and associated reservoirs, often leads to the inundation of vast swathes** of natural habitat and alters natural flow regimes and downstream habitats, the document added.
- Bioenergy, for instance, in all its forms, including **biomass, biofuel and biogas**, has a **larger biodiversity impact per unit of energy** than that of wind and solar.

## Coalition Linking Energy And Nature for action:

- Coalition Linking Energy and Nature for action (CLEAN) is a global initiative that aims to **accelerate the transition to a low-carbon economy** by promoting the sustainable production and use of bioenergy.
- It was launched in 2019 by the **International Renewable Energy Agency** (IRENA) in partnership with the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO), the Global Environment Facility (GEF), and other international organizations.
- CLEAN action aims to **highlight the need for new renewable energy generation projects to be carefully assessed for their impacts on biodiversity**, allowing the options that are the least damaging to nature to be prioritised.
- Today, many renewable energy developers have little awareness or consideration for the impact on nature, be it on land, the ocean, or freshwater ecosystems.

- CLEAN action hopes to change this, so that the **effect on biodiversity is a required element of any new proposed energy initiative.**

## 56. WMO

**Context:**

- **Around 15,000 deaths caused in Europe in 2022 due to heat: What the new World Meteorological Organisation report says**
- **2022 Heatwaves in Europe**
- **The United Kingdom** experienced 40-plus degree Celsius heat for the first time ever.
- **Ireland** had its highest temperature since 1887. **Hamburg, in Germany**, became the most northern part of the country to ever **record 40 degree Celsius temperature.** Even **Sweden**, one of the coldest countries, recorded temperatures **in excess of 37 degree** Celsius last year.
- During the summer, around 4,600 deaths in Spain, 4,500 in Germany, 2,800 in the United Kingdom (among those aged 65 and older), 2,800 in France and 1,000 in Portugal were associated with the unusual heat.

**Heatwave:**

- A **heatwave** is a **period of abnormally high temperatures**, a common phenomenon in India during the months of **May-June** and in some rare cases even extends till July.
- **India Meteorological Department (IMD)** classifies heat waves according to regions and their temperature ranges. As per IMD, the number of heatwave days in India has increased from 413 over 1981-1990 to 600 over 2011-2020.
- **Criteria for declaring the heatwave:**
- The **Heatwave** is considered when the **maximum temperature of a station reaches at least 40°C for Plains** and **at least 30°C for Hilly regions.**
- If the **normal maximum temperature of a station** is less than or equal to **40°C**, then an increase of **5°C** to **6°C** from the normal temperature is considered to be heat wave condition.
  - Further, an **increase of 7°C or more** from the normal temperature is considered a **severe heat wave condition.**
- If the **normal maximum temperature of a station** is more than **40°C**, then an **increase of 4°C to 5°C** from the normal temperature is considered to be heat wave condition. Further, an increase of **6°C** or more is considered a **severe heat wave condition.**
- Additionally, if the **actual maximum temperature remains 45°C** or more irrespective of normal maximum temperature, a heat wave is declared.

**WMO observations:**

- On average, **global temperature in 2022 was 1.15 degree Celsius higher than pre-industrial times,** which is the average of the 1850-1900 period.
- This happened despite the **prevalence of a strong La Nina event** which is known to have an **overall cooling impact on the planet.**
- **Rise in GHG emissions and concentrations:**
- The three main greenhouse gases – **carbon dioxide, methane and nitrous oxide** – responsible for global warming, were all at record high in 2021.
- **Carbon dioxide** concentrations in atmosphere now exceed 415 parts per million.
- The **concentrations of methane,** less prevalent but more damaging than carbon dioxide, **increased to 1908 parts per billion in 2021.** The increase of **18 ppb** between **2020 and 2021 was the highest annual rise ever**.
- **Displacement due to climate change:**
- About **95 million people** across the world had already suffered **displacement because of climate change reasons.**
- Most people displaced in **climate- or weather-related events remained within the territories where they resided,** while in some situations people were forced to flee across international borders in search of safety and assistance.

**Status of heatwaves in previous years:**

- The **warmest year on record so far has been 2016** when average global temperatures were measured to be **1.28 degree Celsius higher than pre-industrial times**, not very far away from the 1.5 degree Celsius milestone, which is the world is aiming to avoid.
- The years **2015 to 2022** have been the **eight warmest years** in the **173 years of direct record keeping**.
- The year **2022** would be **fifth or sixth** on that list of warmest years.

**TEMPERATURE ABOVE PRE-INDUSTRIAL LEVEL (IN DEG CELSIUS)**
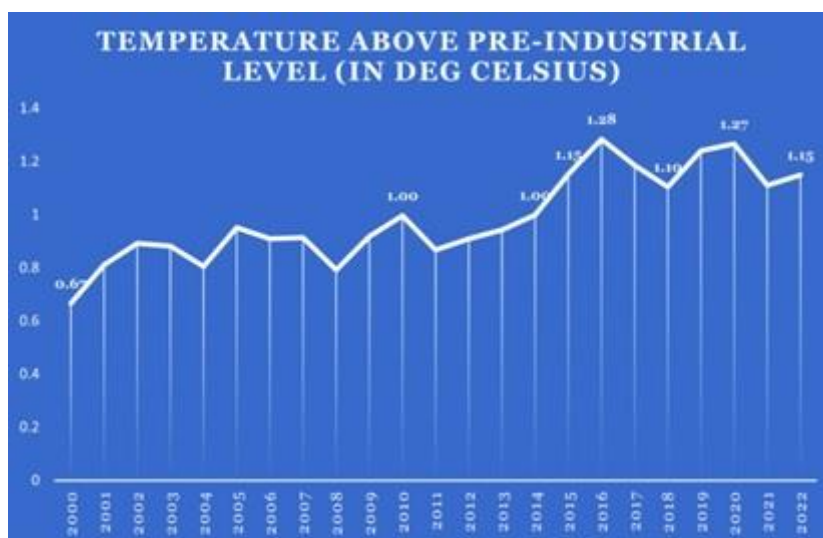
**57. UN reports 'off the charts' melting of glaciers**

**Context:** The last eight years have been the warmest ever recorded, while concentrations of greenhouse gases such as carbon dioxide hit new peaks, the **UN's World Meteorological Organization.**

**Findings of the report:**

- The world's glaciers melted at **dramatic speed last year** and saving them is effectively a lost cause, the United Nations reported, as climate change indicators once again hit record highs.
- The last eight years have been the warmest ever recorded, while **concentrations of greenhouse gases such as carbon dioxide hit new peaks**, the UN's World Meteorological Organization.
- **Antarctic sea ice fell to its lowest extent** on record and the melting of some European glaciers was, literally, off the charts
- **Sea levels** are also at a **record high**, having **risen** by an average of 4.62 millimetres per year between 2013 and 2022 — **double the rate it was between 1993 and 2002**.
- Record high temperatures were recorded in the oceans — where around **90% of the heat trapped on Earth by greenhouse gases ends up.**
- The **global mean temperature in 2022 was 1.15 C above** the 1850-1900 average, the WMO report
- The report said **greenhouse gas concentrations reached new global highs** in 2021.
- The **concentration of carbon dioxide ($CO_2$) reached 415.7 parts per million globally**, or 149% of the pre-industrial (1750) level, while methane reached 262% and nitrous oxide hit 124%.
- The world's reference glaciers — those for which long-term observations exist — saw an **average thickness loss of more than 1.3 metres between October 2021 and October 2022** — a loss much larger than the average over the last decade. The **cumulative thickness loss since 1970 amounts to almost 30 metres.**
- **UNESCO finds that some iconic World Heritage glaciers will disappear by 2050**
- **Africa**:
  - According to available data, glaciers in all World Heritage sites in Africa will very likely be gone by 2050, incl. Kilimanjaro National Park and Mount Kenya
- **Asia**:
  - Glaciers in **Three Parallel Rivers of Yunnan Protected Areas** (China) – #1 highest mass loss relative to 2000 (57.2%) and also the **fastest melting glacier on the List**
  - **Glaciers in Western Tien-Shan** (Kazakhstan, Kyrgyzstan, Uzbekistan) have shrunk by 27% since 2000
- **Europe**:
  - **Glaciers in Pyrenees Mont Perdu** (France, Spain) – very likely to disappear by 2050
  - **Glaciers in The Dolomites** (Italy) – very likely to disappear by 2050
- **Latin America:**
  - **Glaciers in Los Alerces National Park** (Argentina) – #2 highest mass loss relative to 2000 (45.6%)
  - **Glaciers in Huascaran National Park** (Peru) have shrunk by 15% since 2000
- **North America:**
  - **Glacierized patches in Yellowstone National Park** (United States of America) – very likely to disappear by 2050
  - **Glaciers in Yosemite National Park** (United States of America) – very likely to disappear by 2050
  - **Glaciers in Waterton Glacier International Peace Park** (Canada, United States of America) have lost 26.5% of their volume in 20 years
- **Oceania:**

- **Glaciers in TeWahipounamu** – South West New Zealand (New Zealand) have lost almost 20% of their volume since 2000

## 58. Andhra mining agency told to 'go back' by Nimmalapadutribals at public hearing

**Context:** First hearing since 1997 Supreme Court judgment, Kept out of mining lease decisions at least five times despite legal win, say villagers.

**More on the News:**

- A public hearing for granting mining licences in a Fifth Schedule village in Andhra Pradesh was met with slogans to "go back" by tribal community members. Nimmalapadu had **won a legal battle in 1997 against the state government and a private company** to **save their village from mining** and has staved off several attempts to violate the ruling since then.
- This public hearing was the first one in 31 years and came two months **after Andhra Pradesh Mineral Development Corporation (APMDC) prepared an Environment Impact Assessment (EIA) report** for obtaining environmental clearances. This is a fresh attempt by APMDC to grant mining licenses in the region.
- The residents alleged the APMDC issued licences five times since 1997 to cooperatives or individuals from the state belonging to the Konda Dora community who did not belong to these villages. The state agency found new ways to keep the people out of the process and no hearings were conducted for granting these licences.

**SC Direction:**

- The 1997 judgement was popularly called the **Samata judgement** after the name of the non-profit that helped the people fight the case.
    - In the landmark ruling, the Supreme Court had **declared that only people belonging to the Konda Dora tribe and their cooperatives could exploit minerals in Fifth Schedule** areas and **that private mining, even with government backing**, is
- Supreme Court **reiterated the Constitution's Fifth Schedule that land and resources in these areas should belong to the Scheduled Tribes**. The state government should be responsible for encouraging tribal people to come forward by providing the necessary support.

**Konda Dora tribe**

- Konda Dora is **a tribal community** living in the **hilly regions of the Eastern Ghats in Andhra Pradesh and Odisha**. They are also known as Kondadora or Kondh, and speak the Kui language.
- The Konda Dora tribe is known for their unique cultural practices, including the **worship of the earth goddess, Dharani Penu.** They also have a rich tradition of oral literature, which includes folk songs, myths, and legends.
- The Konda Dora community **is primarily involved in agriculture and forest-based livelihood activities** such as hunting, fishing, and gathering of forest products. They **practice shifting cultivation** and grow crops such as paddy, millets, and vegetables. The tribe also has traditional knowledge about herbal medicines, which they use to treat various ailments.
- The Konda Dora community has faced several challenges, including **displacement from their ancestral lands due to mining** and other development activities. They have also struggled with **poverty, lack of access to basic amenities, and discrimination**.

## 59. Supercritical carbon dioxide

**Concept :**

- A new research by IIT Madras has suggested the use of Supercritical carbon dioxide to flush out oil from depleting oil and gas reservoirs.
- **About Supercritical carbon dioxide:-**
- Supercritical carbon dioxide ($CO_2$) is a **fluid state of $CO_2$ where it is heated and held at or above its critical temperature(31∘C) and pressure(73 atm)**.
- In this supercritical phase, **$CO_2$ exhibits properties and behaviours between that of a liquid and a gas.**
- Supercritical $CO_2$ possesses liquid-like densities with gas-like diffusivity, surface tension and viscosity.

'**Surfactant-Alternating gas (SAG) injection' approach:**

- In this process, **carbon dioxide gas is injected into the reservoir, where it becomes supercritical, followed by injection of water or surfactant solution**.

Figure 1: Phase diagram of CO₂ (T_C: critical temperature, P_C: crititcal pressure.
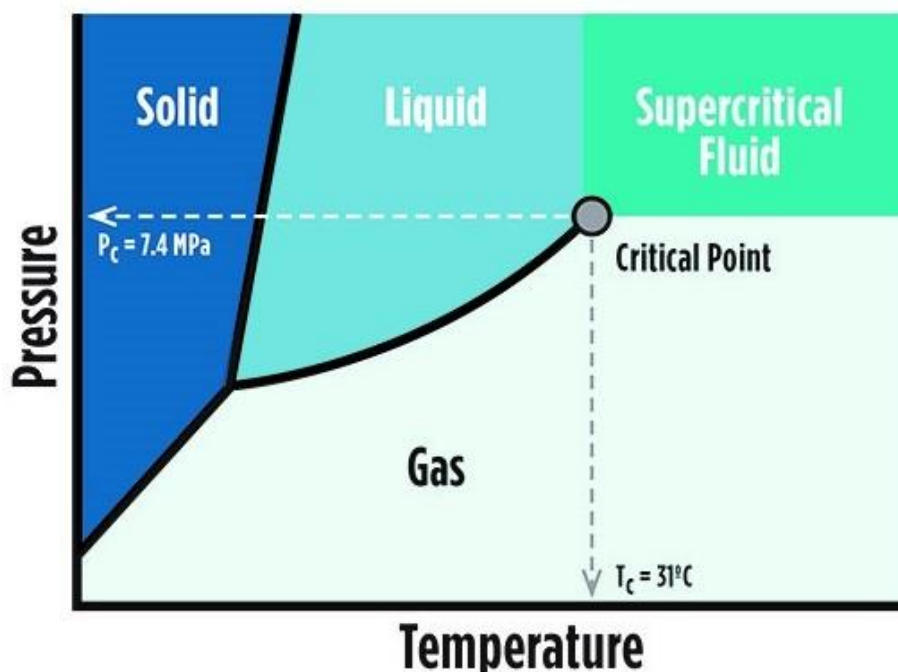
**Use of Supercritical Carbon Dioxide (CO2):-**

- It is used in the oil and gas industry for gas injections during enhanced oil recovery (EOR) techniques.
- When supercritical CO2 reacts with water, carbonic acid (H2CO3) is formed.
- Carbonic acid lowers the pH in the reserve and creates an environment that is corrosive to metal equipment.

**60. Elephant seals enter 'sleep spiral' during deep ocean dives**

**Context:** Northern elephant seals might be masters of multitasking in the animal kingdom because they've learned how to sleep and dive at the same time — all while avoiding predators.

**More on the News:**

- The **elephant seals can spend seven or eight months on foraging trips** in the North Pacific Ocean and travel for thousands of miles away from land, which **led researchers to question how and where the marine mammals sleep** in the high seas.
- A new study, involving seals **fitted with caps** similar to those worn by humans in sleep clinics, **revealed that the seals sneak in short naps during deep dives** while holding their breath.
- When the seals experience **sleep paralysis as they enter rapid eye movement**, or REM, sleep, **they lose control of their posture and continue to spiral down** in a corkscrew pattern. The researchers refer to this as a "sleep spiral."
- The research marked the first time scientists r**ecorded brain activity in free-ranging wild marine mammals,** capturing data from 104 sleep dives.
- The **10-minute naps during these 30-minute dives** help elephant seals get about two hours of sleep per day during foraging trips, as opposed to the 10 hours they catch while snoozing on the beach during breeding season.

**Elephant Seal:**

- Elephant seals are **large marine mammals** that belong to the family Phocidae, also known as "true seals."
- There are two species of elephant seals, the **northern elephant seal and the southern elephant seal**, both of which are found in the Pacific Ocean.
- **Northern Elephant Seals:**
  - Northern elephant seals are **found across the Pacific coast of the United States, Canada and Mexico**.
  - They generally breed and give birth in California and Baja California. That too **usually on offshore islands** from December to March. They **fast during mating** season, losing perhaps a third of their body weight.
- **Southern Elephant Seals:**
  - Southern elephant seals are the **largest of all seals**. They live in sub-Antarctic and Antarctic waters that feature brutally cold conditions.
  - Southern elephant seals **breed on land but spend their winters in the frigid Antarctic waters** near the Antarctic pack ice.

- These seals are known for their **large size,** with adult males weighing up to 4,500 kg and reaching lengths of up to 6.5 meters.
- Elephant seals are known for their **unique lifestyle**, spending most of their lives at sea and **only coming ashore for breeding and molting**.
- They are **known for their deep dives**, with some individuals reaching depths of up to 2,000 meters and **staying underwater for over two hours at a time**.
- These seals play an **important role in the marine ecosystem**, as they are a **key predator of squid and fish.** Additionally, their **nutrient-rich feces contribute to the growth of phytoplankton**, which form the base of the marine food chain.

## 61. India's cheetah plan recipe for conflict

**Context:** Project Cheetah overestimated the carrying capacity of Kuno National Park and did not factor in the unique spatial requirement of the species before flying in 20 spotted cats from Africa, according to a group of Namibian researchers.

**Findings of Namibian Researchers:**

- In southern Africa, **cheetahs live in a stable socio-spatial system** with widely spread territories and **densities of less than one individual per 100 km²**.
  - Therefore, the **carrying capacity is usually between 0.2 and 1 adult per 100 km²** for cheetahs under natural conditions.
- The plan for cheetahs in KNP **assumes that the high prey density** will sustain high cheetah densities, even though there is no evidence for that.
  - It also **ignores important aspects of the cheetah socio-spatial system**.
  - Spatial ecology addresses the fundamental effects of **space on the movement of individual species and on the stability of multispecies communities.**
- As KNP is small, it is **likely that the released animals will move far beyond the park's boundaries and cause conflicts** with neighboring village
  - Kuno National Park is an **unfenced wilderness area** of approximately 17 by 44 kilometers (about 750 km²).
  - Based on a calculation of the local prey density, it was calculated **that 21 adult cheetahs could be sustained by the prey base** in Kuno National Park—equivalent to a density of about three individuals per 100 km².
- In **Namibia**, **territories are larger and prey density lower**, in **East Africa territories are smaller and prey density higher**—but the **distance between territories is a constant** and no new territories are established in between. **For the reintroduction plan in Kuno National Park, these distances were ignored.**
- Already with the cheetahs transferred from Namibia in autumn 2022, including three males, the **carrying capacity of Kuno National Park has been reached** in terms of the cheetahs' territorial system.

**Name of Cheetah translocated from South Africa:**

- 12 cheetahs (7 male and 5 female) translocated from South Africa in the second phase under the reintroduction of 'Project Cheetahs' have also been given Indian names. They have been renamed **Daksha, Nirva, Vayu, Agni, Gamini, Tejas, Veera, Suraj, Dheera, Uday, Prabhas and Pavak**.

**Incidents so far:**

- **Straying outside National Park:** Forest officials rescued a **male cheetah** that strayed out of the conservation area of Kuno National Park in Madhya Pradesh last week. As per reports, this is the second time in a month when the **Cheetah named Oban** has been **tranquilised and brought back** to the national park after it strayed out of the park.
- **Sasha**, **died of a kidney ailment** on March 27.
- One of the cheetahs '**Uday'** which was aged six years, translocated to Madhya Pradesh's Kuno National Park (KNP) from South Africa died on April 23.
- Another cheetah, named **Siyaya**, recently **gave birth to four cubs**.

Cheetah Reintroduction Plan: https://optimizeias.com/cheetah-reintroduction-in-india/
Cheetah: https://optimizeias.com/asiatic-cheetah/

## 62. Cheetah deaths

**Context:** One of the 12 cheetahs flown in from South Africa in February, a six-year-old male named Uday, died in Kuno National Park on April 23.

**More on the News:**

- Of the 20 cheetahs brought to India from Africa in the **world's first intercontinental translocation project**, 18 now remain. Five-year-old **Sasha**, one of the eight cheetahs that arrived from Namibia last September, died on March 27.
- Only days ago, Madhya Pradesh CM had asked the state forest department to **prepare Gandhisagar Wildlife Sanctuary as the second home** for the spotted cats to relieve pressure on Kuno.

**Were these unfortunate cheetah deaths unexpected?**

- The Cheetah Project **did anticipate high mortality**. The criteria for the **project's** short-term **success was only "50% survival of the introduced cheetah for the first year"**. That would be 10 out of 20.
- As a result, the Madhya Pradesh government set a six-month deadline for readying **Gandhisagar** — in the Chambal river valley in Mandsaur and Nimach districts — for the cheetahs. There is also talk about moving a few animals from Kuno to the safety of an 80-sq-km **fenced area in Rajasthan's Mukundra Hills Tiger Reserve.**
- The focus, therefore, is **shifting from the project's stated purpose** — that of **establishing the cheetah in an open landscape as a free-roaming and self-sustaining** population occupying thousands of square miles **— to managing the African imports as a few pocket populations in fenced-in or restricted areas**.

## So is shifting the goalpost a viable step?

- In the absence of natural dispersal, managing a meta-population involves moving suitable individuals from one pocket population to another to maintain genetic viability.
- In 2018, a study documented **how meta-population management conserved a declining population of 217 cheetahs in 40 small populations** in South Africa.
- In 2009, **40 fenced reserves in South Africa held only 289 cheetahs** even though as many as 343 were translocated to 48 fenced reserves from Namibian and South African ranches since 1965. Once the supply was stopped in 2009, numbers further fell to 217 by 2012.
- At that stage, the **key conservation problems (such as high lion density**) were identified and **addressed before shuffling cheetahs** from one pocket population to other.
- In six years, the **meta-population grew to 328 cheetahs**, offering a viable roadmap for the South African model of conserving animals in fenced reserves in regions with dense human populations blocking natural gene flow.

## And how do cheetahs die?

- The South African study also documented the causes of mortality, where it could be established, for 293 cheetah deaths.
- It found that **holding camps caused 6.5% of cheetah deaths**, **immobilisation/ transit caused 7.5% deaths**, and **another 0.7% were caused by tracking devices**. This added up to almost 15% — so, one in every seven cheetah deaths was attributed to handling and management.
- **Predation turned out to be the biggest killer** in the study, **accounting for 53.2% of cheetah mortality**. **Lions, leopards, hyenas, and jackals** were primarily responsible. Several other wildlife including warthogs, baboons, snakes, elephants, crocodiles, vultures, zebras, and even ostriches killed cheetahs.
- It is well documented that **cheetahs suffer very high cub mortality — up to 90% in protected areas** — mainly **due** to **predation**. Consequently, nearly 80% of all cheetahs throughout their range in Africa are found living outside of protected parks and reserves.

## So what options are available to the project now?

- The Cheetah Project **can choose to cut the risk by settling for the South African model of retaining a few pocket populations in fenced-in reserves**. But if it chooses not to make this compromise, the project does face an uphill task.
- In the long run, the success — or failure — of the cheetah project will be determined within the framework of India's traditional conservation ethos that envisages protecting naturally dispersing wildlife in viable non-fragmented habitats.

## 63. Urea rules India's Farms

**Context:** Sales of the nitrogenous fertiliser have scaled new highs despite measures to check its use.
**Background:**

- In May 2015, the **Centre made it mandatory to coat all indigenously manufactured and imported urea with neem oil**. This was **followed by replacing 50-kg bags with 45-kg ones** in March 2018, and the **launch of liquid 'Nano Urea' by the Indian Farmers' Fertiliser Cooperative (IFFCO)** in June 2021.
- None of the above measures — checking illegal diversion for non-agricultural use, smaller bags, and increasing nitrogen use efficiency — have succeeded in reducing urea consumption.
- **Sales of urea** crossed a **record 35.7 million tonnes (mt) in the fiscal year** ended March 31, 2023. Consumption did dip in the initial two years **after neem-coating** was fully enforced from December 2015, **seemingly making it difficult for the heavily subsidisedfertiliser to be used by plywood, particle board, textile dye**, cattle feed and synthetic milk makers.
- But that trend reversed from 2018-19. **Urea sales** in 2022-23 were **about 5.1 mt higher** than in **2015-16** and over 9 mt than in 2009-10, before the introduction of the so-called nutrient-based subsidy (NBS) regime in April 2010. **All other fertilisers, barring single super phosphate (SSP), have registered much lower increases** or even declines.

## The failure of NBS

- Under NBS, the **government fixed a per-kg subsidy for each fertiliser nutrient**: **Nitrogen (N), phosphorus (P), potash (K) and sulphur (S).** This was as against the earlier product-specific subsidy regime.
- Linking subsidy to nutrient **content was intended to promote balanced fertilisation** by **discouraging farmers from applying too much urea**, di-ammonium phosphate (DAP) and muriate of potash (MOP). These are fertilisers with high content of a single nutrient: Urea (46% N), DAP (46% P plus 18% N) and MOP (60% K).

- NBS was expected to **induce product innovation**, besides **more use of complex fertilisers** (having lower concentrations of N, P, K and S in different proportions) and **SSP** (containing only 16% P but also 11% S).
- However, the data reveals worsening of nutrient imbalance, with **urea consumption rising by over a third since 2009-10**. This has been **largely courtesy of its maximum retail price (MRP) going up by a mere 16.5% – from Rs 4,830 to Rs 5,628 per tonne** – post the introduction of NBS.
- The government has, in the last one year, **also brought back price controls on DAP, with companies not allowed to charge more than Rs 27,000 per tonne**. It has led to the sales of both fertilisers soaring in 2022-23, at the expense of NPKS complexes and SSP.

## The cost of imbalanced fertilization

- Fertilisers are essentially food for crops. They, like humans, need nutrients – primary (N, P, K), secondary (S, calcium, magnesium) and micro (iron, zinc, copper, manganese, boron, molybdenum) – for plant growth and grain yield.
- More recent research at Punjab Agricultural University, Ludhiana – has established a **decline in nitrogen use efficiency** (NUE) itself. NUE **refers to the proportion of N applied mainly through urea that is actually utilised by crops** to produce harvested yields. It has estimated the NUE in India to **have fallen from 48.2% in 1962-63 to 34.7% in 2018.** The 34.7% NUE was below the global average of 45.3% and 53.3% for North America in 2018.
- This **soil organic nitrogen may then undergo mineralisation** (reconvert into inorganic ammonium form) and become available to the subsequent crops. The remaining unutilised N, however, **escapes from the soil-plant system through hydrolysis** (breakdown of urea into ammonia gas and its release into the atmosphere) and **nitrification** (below-the-ground leaching after conversion into nitrate).

## Solution:

- The obvious solution is **to reduce its consumption** and **promote products containing other nutrients in desired (crop- and soil-specific) combinations**.
- There are **two approaches** to cut urea consumption. The first is **raising prices**. Second approach is **to improve NUE – enabling farmers to harvest the same or more grain yields** with fewer bags.
- Nano Urea is also **primarily aimed at boosting NUE**. The ultra-small size of its particles (20-50 nanometers, as against 1-4 millimeters for normal prilled/granular urea; 1 mm=1 million nm) is said to allow easier penetration through the stomatal pores of leaves. IFFCO claims that a single 500-ml Nano Urea bottle containing just 4% N can effectively replace "at least" one 45-kg bag of regular 46% N urea.

Fertilizer usage in India https://optimizeias.com/imbalance-in-fertilizer-use/

## Nano Urea:

- Nano Urea (Liquid) is a source of nitrogen which is a major essential nutrient required for proper growth and development of a plant. Nitrogen is a key constituent of amino acids, enzymes, genetic materials, photosynthetic pigments and energy transfer compounds in a plant. Typically, nitrogen content in a healthy plant is in the range of 1.5 to 4%.
- Foliar application of Nano Urea (Liquid) at critical crop growth stages of a plant effectively fulfils its nitrogen requirement and leads to higher crop productivity and quality in comparison to conventional urea.
- Nano Urea (Liquid) contains **nanoscale nitrogen particles** which have **more surface area** (10,000 times over 1 mm Urea prill) and number of particles (55,000 nitrogen particles over 1 mm Urea prill).which makes it more impactful.
- In comparison to Urea the **uptake efficiency of Nano Urea is more than 80 %**. It is thus, required in lesser measure compared to the conventional urea fertiliser to fulfil plant's nitrogen requirement.
- Nano Urea (liquid) has been tested for biosafety and toxicity as per the guidelines of Department of Biotechnology (DBT), Government of India and OECD international guidelines.
- Nano Urea (liquid) is completely safe for human, animals, birds, rhizosphere organisms and environment at the recommended levels of application.
- Nano Urea (Liquid) **does not involve any government subsidy** and will be made available to farmers at a 10% lower price than a bag of subsidised Urea.
- Transportation would be easier and economical, as one 500 ml bottle would be equivalent to one bag of regular urea fertiliser.

## Benefits of IFFCO Nano Urea

- increase the nutrient usage efficiency Efficacy of one bottle of Nano Urea (500 mL) is equivalent to one bag of urea.
- minimize nutrient losses
- Reduces the requirement of conventional Urea by 50% or more
- Environment friendly product, can improve Soil, Air & Water quality thus, helps in addressing the concerns of Global Warming and in meeting the UN SDGs.
- increase the crop yield by an average of 8 per cent along with improving the quality of farm produce by providing better nutrition to crops, according to the coorperative.
- Cheaper than conventional urea.
- Reduce input cost to farmers, leads to increase in farmers' income.

- Improves crop productivity, soil health and nutritional quality of produce.
- Nano Urea (liquid) increases **crop productivity** and can reduce the requirement of **conventional Urea by 50%.**
- Application of nano urea (liquid) improves yield, biomass, soil health and nutritional quality of the produce.

**Mechanism of assimilation by plants**

The size of one nano urea liquid particle is 30 nanometre and compared to the conventional granular urea it has about 10,000 times more surface area to volume size. Due to the ultra-small size and surface properties, the nano urea liquid gets absorbed by plants more effectively when sprayed on their leaves.

Upon penetration, these nanoparticles reach plant parts where nitrogen is required and release nutrients in a controlled manner, thereby reducing usage while also reducing wastage into the environment.

- When sprayed on leaves Nano Urea easily enters through stomata and other openings and **is assimilated by the plant cells.**
- It is easily distributed **through phloem** from **source to sink inside the plant** as per its need. **Unutilised nitrogen is stored in the plant vacuole** and is slowly released for proper growth and development of plant.

**64. Trees, crops endemic to India can help combat air pollution**

**Context:** Peepal, mango, neem, maize, safflower & pigeon pea are found to be most suitable for areas with higher levels of air pollution.

**More on the News:**

- Certain trees and crops which are endemic to India **can help lower the impact of air pollution by absorbing and filtering pollutants**, according to a new study.
- Trees such as pipal, neem, mango and crops like maise, pigeon pea and safflower are best suited for areas with higher levels of air pollution, noted the study.
- These trees **exhibited the highest air pollution tolerance index** (APTI) values.
- The **level of ascorbic acid** in plants **determines their tolerance** against the adverse effect of oxidising pollutants. Ascorbic acid levels were higher in peepal, followed by mango trees.

**65. India China border talks**

**Context:**

- The **18th round of India- China Corps Commander Level Meeting** took place at **Chushul-Moldo border** meeting point on the Chinese side.
- **More about the news:**
- On Sunday, the **18th round of India- China Corps Commander Level** Meeting took place a**t Chushul-Moldo border meeting poin**t on the **Chinese side.**
- The Indian side was represented at the Corps Commander Level meeting by **Fire and Fury Corps Commander Lt Gen Rashim Bali.**
- Both the countries are **said to be stuck at negotiations over Demchok and Depsang** friction points with **China showing reluctance over taking up these two issues** in a series of boundary resolution talks held **post Galwan standoff in May, 2020.**

**India-China Border Major Disputed Region.**

- **Please refer the map given below:**

**India-China Border Dispute**
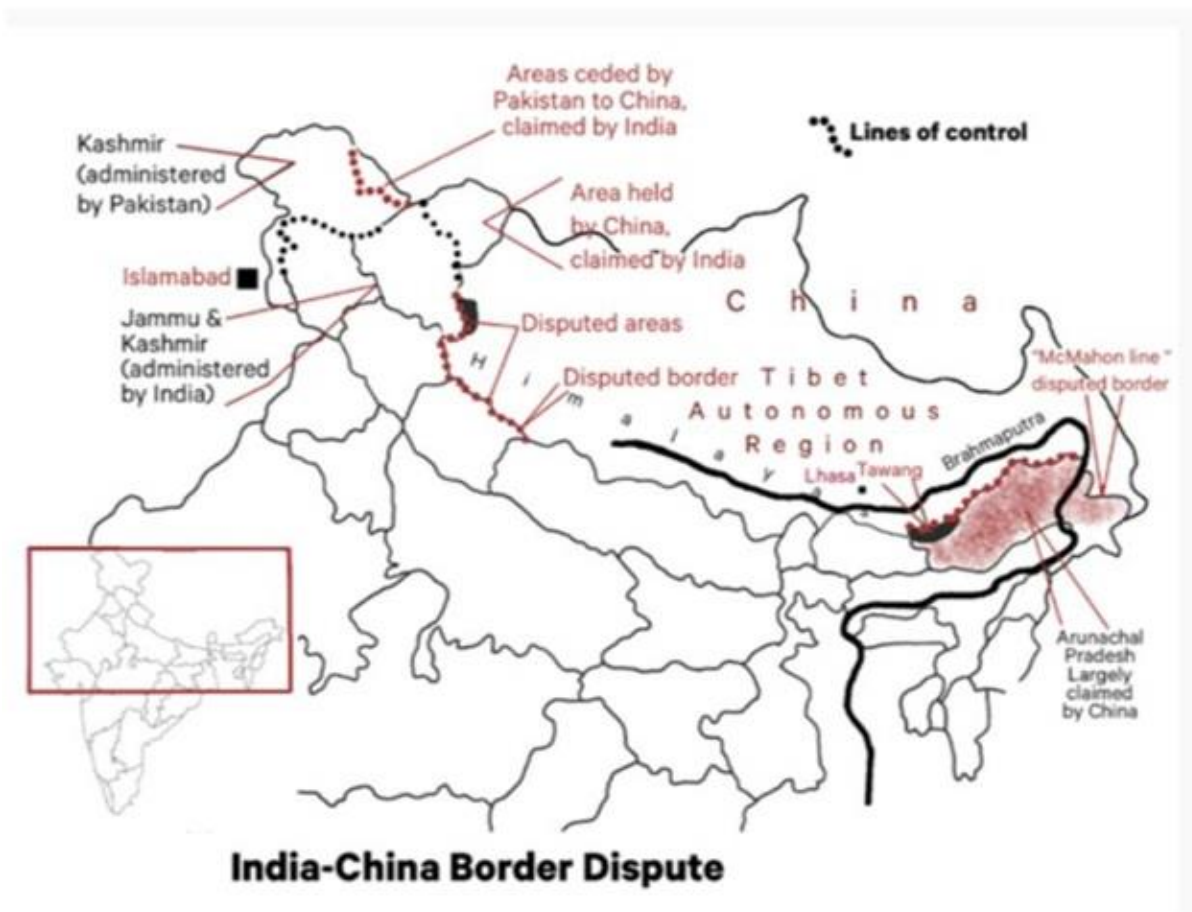
### 66. Fly ash particles found in Antarctic ice

**Context:** In a first, fly ash particles found in Antarctic ice, thousands of kilometres from potential source.
**More on the News:**

- **Spheroidal carbonaceous particles** (SCP), a component of fly ash, have been **identified** for the first time in an **Antarctic ice core**, according to a new study.
- Not just that, the **particles recovered dated back to 1936**, according to scientists from British Antarctic Survey and the University College London.
- SCPs have no other anthropogenic or natural sources other than fossil fuel combustion. Thus, they are an unambiguous **environmental indicator of industrialisation**.
- The study provided the first evidence that SCPs have not only been transported to continental Antarctica, but that those enduring **physical markers of fossil fuel combustion have been trapped in ice layers** since the early decades of the 20th century.
- **Atmospheric circulation and transport** processes have **probably influenced the deposition of SCPs in Antarctica** throughout the twentieth century, especially related to the strength and position of the Southern Hemisphere westerly winds.
- The **westerly winds are predicted to increase in strength during the 21st century** and this might lead to an increased deposition of fly ash particles and other anthropogenically-derived atmospheric pollutants in Antarctica in the future.

More about Fly ash: https://optimizeias.com/new-moefcc-notification-on-fly-ash-includes-solar-wind-power-plants-for-reclamation/

### 67. SC modifies order on eco-sensitive zone around national parks, sanctuaries
**Context**:

- The Supreme Court Wednesday modified its 2022 order mandating a **minimum 1-km eco-sensitive zone around national parks or wildlife sanctuaries**, saying it would have prevented the government from building roads and other important infrastructure in those areas.
- With the June 3, 2022 order sparking concerns about human habitations falling within the proposed ESZs, the Centre had approached the court seeking modification of some of the directions.

- On Wednesday, a bench of Justices B R Gavai, Vikram Nath and Sanjay Karol said the 2022 order will not be applicable to ESZs in respect to which draft and final notifications have been issued by the Ministry of Environment, Forests and Climate Change, and where proposals for such notifications have been received by the ministry.
- It will also not be applicable where the national parks and sanctuaries are located on inter-state borders or share common boundaries.
- But it underlined that no mining would be allowed, either within national parks and sanctuaries or in a 1-km radius.

**Why new order?**

- As per the previous order t no permanent structure would be permitted to come up for whatsoever purpose in the aforesaid ESZs. Hundreds of villages are situated within the ESZs in the country. If no permanent construction is to be permitted for any purpose, a villager who is desirous to reconstruct his house would not be permitted. Similarly, if there is an extension in their family and some additional construction is required for accommodating the enlarged family, the same would also not be permitted. Similarly, if the Government decides to construct schools, dispensaries, anganwadis, village stores, water tanks and other basic structures for improvement of the life of the villagers, the same would also not be permitted. The effect of the order will be to prevent the State or the Central Government from constructing roads and provide other facilities to the villagers.
- MoEFCC provides financial assistance to the States under the Centrally Sponsored Scheme-Integrated Development of Wildlife Habitats, which includes assistance for eco-development activities. These activities often involve construction of small structures which are permanent in nature in areas including ESZs."

**Integrated Development of Wildlife Habitats' (IDWH)**

It is an on-going Centrally Sponsored Scheme which has been made operational by adding more components and activities to the erstwhile Centrally Sponsored Scheme – "Assistance for the Development of National Parks and Sanctuaries" during the 11th Plan Period. Under IDWH, the financial assistance is provided to State/UT Governments for protection and conservation of wildlife and its habitats in Protected Areas (PAs) as well as outside PAs and also for the recovery programmes of the critically endangered species.

**Components of the scheme**

1. Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)
2. Protection of Wildlife Outside Protected Areas
3. Recovery programmes for saving critically endangered species and habitats

Recovery programmes for saving critically endangered species

- So far, 22 species have been identified under the recovery programme. These are the Snow Leopard, Bustard (including Floricans), Dolphin, Hangul, NilgiriTahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion, Swamp Deer, Jerdon's Courser, the Northern River Terrapin, Clouded Leopard, Arabian Sea Humpback Whale, Red Panda and Caracal.

**Eco-Sensitive Zones**

- Eco-Sensitive Zones (ESZs) are also known as **Ecologically Fragile Areas (EFAs).**
- Eco-sensitive zones are areas notified by the MoEFCC around Protected Areas, National Parks and Wildlife Sanctuaries.
- The purpose of declaring ESZs is **to create some kind of "shock absorbers"** to the protected areas by regulating and managing the activities around such areas.
- As per the **National Board for Wildlife NBWL, the delineation of eco-sensitive zones have to be site-specif**ic, and the activities should be regulative in nature and not prohibitive unless required.
- The basic aim is to regulate certain activities around National Parks and Wildlife Sanctuaries to minimize the negative impacts of such activities on the fragile ecosystem encompassing the protected areas.
- They also act as a transition zone from areas of high protection to areas involving lesser protection.

**Implementation of Ecologically sensitive zones (ESZs)**

- According to the Wildlife Conservation Strategy of 2002 areas within 10 km of the boundaries of protected areas must be notified as **ecologically fragile zones under Section 3(2)(v) of the Environment Protection Act 1986 and its Rules 5(viii) and (x).**
- The MoEFCC was entrusted to undertake measures to protect the environment by regulating and prohibiting industries, operations and processes.
- However, Rule 5(1)(vi) had provisions for permitting environmentally compatible land-use in areas around protected areas.
- Further, the **National Board for Wildlife (NBWL) in 2005** decided to define site-specific ESZs to regulate specific activities instead of a blanket ban on them. Thus, the MoEFCC directed the States and UTs to propose ESZs.
- As per the guidelines of the MoEFCC, in order to declare areas as ESZs, a committee consisting of the Wildlife Warden, an ecologist, and an official from the local government was to determine the extent of each ESZ.
- The **Chief Wildlife Warden** was entrusted with the task of preparing a list of those activities that are to be prohibited or restricted or that can be allowed with additional safeguards.

- Later, the State government must submit this list along with the geographical description, biodiversity values, the rights of local communities, their economic potential and implications for their livelihoods, as a proposal to the MoEFCC for notification.
- Further, the State government is mandated to come up with a draft Zonal Master Plan within two years of notification.

## 68. European Union members approve carbon market scheme, other climate laws
### Why in News?

- EU countries have given the final sign-off for a series of new climate change-related laws, which seek to create financial incentives for keeping emissions in check, and penalties for failing to do so.
- The 27 member states in the EU approved a revamp to the bloc's so-called carbon market, which is set to make it more costly to pollute for businesses in Europe.
- This in turn led to sharpening of the main tool the EU has, to discourage carbon dioxide emissions in the industrial sector.
- The changes to the EU's Emissions Trading System (EU ETS), more commonly called the bloc's **carbon market**, are one of five new laws given final approval after being proposed by the European Commission and after a favorable vote at the European Parliament.

### What is the carbon market?
Carbon Markets are essentially a tool for putting a price on carbon emissions and establishing trading systems where carbon credits or allowances can be bought and sold. As per the UN a carbon credit is a kind of tradable permit that equals one tonne of carbon dioxide removed, reduced or sequestered from the atmosphere. Carbon allowances or caps are determined by countries or governments according to their emission reduction targets.

### Expected Consequences of the Proposed Changes
The changes will set more stringent targets and tougher penalties as time passes. The new rules increase the overall ambition of emissions reductions by 2030 in the sectors covered by the EU ETS to 62% compared to 2005 levels. The free permits granted to companies for lower levels of emissions will be gradually phased out, by 2034 for heavy industries and by 2026 for the aviation sector, for instance.

### Concerns Raised Against the Proposed Changes
There had been some resistance to the changes within the bloc, which are roughly two years in the making. Only 23 of 27 EU members voted in favor; Poland and Hungary opposed it, Belgium and Bulgaria abstained. Critics like Poland had argued that the targets were too ambitious and would place an unfair strain on industry. **Some EU policies and laws require unanimous approval from member states, but for most others a qualified majority vote will be sufficient.**

### Other Key Alterations Approved by the EU
The changes to the ETS discussed above are part of the EU's "**Fit for 55**" package of climate plans, which is a reference to its goal of reducing carbon emissions by **55% by 2030 compared with a 1990 benchmark**. Four more alterations were also approved.

1. A plan to incorporate parts of the shipping industry into the ETS was approved. It means that they too will need to buy permits to cover their emissions at times.
2. A new, separate ETS will be established for the buildings and road transport sectors and some other sectors, mainly small industry according to the EU.
3. Changes specifically tailored to the aviation sector were also approved.
4. **Carbon Border Adjustment Mechanism (CBAM)**

The EU will introduce CBAM which is a landmark tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. The aim of CBAM is to prevent the **offsetting of the greenhouse gas reduction efforts of the** EU, by increasing emissions outside its borders through the relocation of production to countries where policies applied to fight **climate change** are less ambitious than those of the EU.

### Social Climate Fund
The EU is setting up a **Social Climate Fund**. The bulk of the funds would come from the **carbon market revenues** generated by the EU ETS. The member states will be contributing the rest. The fund will be used by member states to finance measures and investments to support vulnerable households, micro-enterprises and transport users and help them cope with the price impacts of an emissions trading system for the buildings, road transport and additional sectors.

## 69. African Swine fever threatens India's Pygmy Hog
**Context:** The world's rarest and smallest wild pig species is "extremely susceptible to extinction" from ASF due to its small populations and limited range.
### Pygmy Hogs

- Scientific Name: **Porculasalvania**
- Pygmy Hogs are **the world's rarest and smallest members** of the pig family.
- It is one of the very few mammals **that build its own home, or nest**, complete with a 'roof'.
- It is an **indicator species** as its presence reflects the health of its primary habitat, tall and wet grasslands.
- **Habitat:**

- Once found in the **narrow strip of tall and wet grassland plains** on the Himalayan foothills, from Uttar Pradesh to Assam, through **Nepal's terai areas and Bengal's duars**, it was thought to have become extinct in the 1960s.
- Currently, the **only known population lives in Assam, India and possibly southern Bhutan.** The only viable population in the wild is in the **Manas Tiger Reserve in Assam.**
- **Threats**
  - One of the main reasons for its **decreasing numbers was grassland degradation** due to grass burning in the dry season and **livestock overgrazing.**
- **Protection Status**
  - IUCN Red List: **Endangered**
  - Wildlife Protection Act, 1972: **Schedule I**

## Pygmy Hog Conservation Programme

- Conservation of pygmy hog was initiated by noted **naturalist Gerald Durrell** and his trust in **1971**. While efforts, in the form of a **conservation survey**, had begun in the **late 1970s**, the **PHCP took off** in **1995**.
- It follows a **two-pronged action plan**
  - **Conservation breeding** of the animal against possible early extinction and re-introduction in selected sites.
  - **Habitat management**.
- Under it, **six hogs** (two males and four females) were captured from the **Bansbari range of the Manas National Park** in 1996 for starting the breeding programme.
- The **success of the initial programme** has led to subsequent efforts.
  - Between **2008 and 2020**, scientists **released 130 pygmy hogs** into two national parks, **Manas and Orang**, and two wildlife sanctuaries, **Barnadi and SonaiRupai**, all in Assam.
  - By **2025**, the PHCP plans to **release 60 pygmy hogs in Manas**.
- Apart from captive breeding, **habitat management** in these reintroduction sites was important before the animals were released.
- Experts have been working on a '**Re-wild project**' in **Manas on grassland management and restoration**.

## African swine fever:

- It is a **highly contagious viral** and **fatal animal disease that infects** and leads to an **acute form of hemorrhagic fever** in **domestic and wild pigs.**
- It was first detected in Africa in the 1920s.
- The **mortality is close to 100**% and since the fever **has no cure**, the only **way to stop its spread is by culling the animals.**
- ASF is **not a threat to human beings** since it **only spreads from animals to other animals.**
- ASF is a disease **listed in the World Organisation for Animal Health** (OIE) Terrestrial Animal Health Code and thus, reported to the OIE.

## 70. Blue washing
**Context:** Report flags how corporates have wormed their way into global food governance
### More on the News:

- A new research has highlighted how **corporate capture of global food governance is increasingly taking place in more visible ways**. There has been a growing presence of firms in governance and spaces, staking claims to be legitimate actors, for example, **through public-private partnerships and multi-stakeholder roundtables.**
- When corporations are involved in public governance, they can also **justify involvement by reframing the concept of public interest in terms that benefit corporations and large private businesses** rather than people and the environment, noted Who's tipping the scales report, released by the International Panel of Experts on Sustainable Food Systems (IPES).
- The **Covid-19 pandemic**, coupled **with Russia's invasion of Ukraine** and food inflation, **aggravated the issue of corporate involvement**. Following these crises, governments and multilateral agencies have been facing fund crunches.
- They control the system "**through lobbying behind the scenes**, political and institutional donations, market power, **shaping trade and investment rules**, shaping research and innovation, as well as influencing other structural aspects of global food systems."
- The **FAO's partnership with CropLife**, a major pesticide lobby organisation that has many large agribusiness firms as members, is one of the more recent examples of this type of arrangement, the document pointed out.
- "While such partnerships **allow firms to 'blue-wash' or 'social-wash' their reputations via closer links with the UN** and other intergovernmental bodies, critics have charged that these kinds of partnerships between private sector actors and international governance bodies also create conflicts of interest," the IPES report said.

## Bluewashing

- Bluewashing is term **used to describe deceptive marketing** that **overstates a company's commitment to responsible social practices.**

- It can be used interchangeably with the term greenwashing but has a greater focus on economic and community factors. Alternatively, it could be phrased as a way that **companies hide the social damage that their policies have caused**.
- **Active disinformation is a tool** that companies use **to make their goods or services more attractive to their consumers and shareholders**.

**Greenwashing:**https://optimizeias.com/what-is-greenwashing/#:~:text=Greenwashing%20refers%20to%20%E2%80%9Cthe%20practice,damaging%20than%20they%2

## 71. Bauxite mining in Jharkhand is impacting soil fertility, people's health

**Context:** Bauxite mining in Gumla district of Jharkhand is making the land barren and affecting the health of the people.
**More on the News:**

- Mining activities say that companies are **not following norms** that **include backfilling of fields** after the conclusion of mining, which is affecting their livelihood.
- Obtaining leases for mining on forest land is a complicated process and while **procuring leases for mining on farming land is comparatively easier.**
- The **forest department** is responsible for monitoring the loss of forest land due to mining and preparing an action plan. However, only wildlife and vegetation come under its ambit. **Monitoring the impact on farmers and tribal communities does not come under its purview.**

**Bauxite:**

- Bauxite is an important ore that is **used for making aluminium**. It is an **oxide of aluminium.**
- Bauxite **appears dull in luster** and is reddish-brown, white, or tan in color.
- It **is not a specific mineral** but a rock consisting mainly of hydrated aluminium oxides.
- The deposits of Bauxite are **mainly associated with laterites and** occur as capping on hills and plateaus, except in coastal areas of Gujarat and Goa.
- Bauxite is primarily used **to produce alumina through the Bayer process**.
- Australia is the largest producer of bauxite, followed by China.

**Bauxite reserves in India**

- There are abundant bauxite reserves in the country. However since they are **located** in **heavily forested areas, inhabited by indigenous people**; mining has been unable to start in these regions.
- By States, **Odisha alone accounts for 53% of country's resources** of bauxite. The ranking of states in terms of bauxite resources is as following
  - Odisha (53%)
  - Andhra Pradesh (16%)
  - Gujarat (8%)
  - Jharkhand (5%)
  - Madhya Pradesh, Maharashtra and Chhattisgarh (4% each).

INDIA
BAUXITE MINES

**72. Pollution control boards aren't underfunded but investing their surplus into fixed deposits**

**Context:** An amount of Rs 2,893 crore found to be invested in fixed deposits by 10 pollution regulators

**More on the News:**

- A research paper, **has raised questions** as to whether State Pollution Control Boards and Pollution Control Committees (SPCBs/PCCs) in India are effectively fulfilling their mandate to control pollution.

- It found that 10 SPCBs/PCCs, all in the **Indo-Gangetic Plain** (IGP), had **invested their annual substantial surplus in the form of short, medium-term fixed deposits** to the tune of Rs 2,893 crore as of March 31, 2021. The amount should ideally have been invested in manpower, infrastructure and equipment.

- A majority of the Boards examined were found to **generate nearly half of their revenues by issuing polluting industries no objection certificates** and granting consent to establish and operate.

- This is because **central government funding** while regular, is **inadequate** as it is provided only for existing centrally sponsored schemes.

- On the other hand, **consistent funding from state governments is largely non-existent**. The authors found that no financial support was provided by state governments to their respective SPCBs/PCCs in all but two states.

- Most of the Boards studied **struggled to spend the entirety of the surplus** they generated for each of the three years. **Pay and allowances for staff comprise over half of SPCB/PCC expenditure**, with some skewing upwards of 80 per cent.

- Despite the poor state of infrastructure in many states, **spending on new infrastructure including lab facilities is low, with some exceptions.** Spending on research, development and studies comprise a tiny fraction of overall expenditure across the board.

- All this led to the surplus being invested into fixed deposits.

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**Central Pollution Control Board**: https://optimizeias.com/indias-pollution-control-boards-were-weakened-over-the-last-14-years/

### 73. Forest fires now pose a threat to the very survival of Uttarakhand's unique biodiversity

**Context:** Forest fire season in Uttarakhand coincides with flowering & breeding months of several vulnerable species, many of them native to Himalayas.

**More on the News:**

- Forest fires are becoming more frequent and fierce in Uttarakhand. Such **regular burnings can be catastrophic for the state as well as the rich biodiversity** it harbours.
- With 7,000 species of plants, Uttarakhand contributes 31 per cent of the country's floral diversity. As many as **119 flowering plants are endemic to the state**.
- The impact of recurrent forest fires in Uttarakhand is therefore not limited to the direct loss of trees and wildlife, their **displacement and subsequent colonisation of unwanted species.**
- By **destroying the leaves and foliage**, a forest fire can significantly **reduce the photosynthetic activity of surviving trees** and thereby affect their growth.
- It can also **damage the seed bank**, both above and below the ground, and **wipe out the seedlings and saplings growing on the forest floor.** Species that are sparsely distributed and have small or patchy populations suffer the worst impacts as they lose their habitat, territories, shelter and food.
- The **loss of keystone organism**s in forest ecosystems, such as invertebrates, pollinators, and decomposers, can significantly slow the recovery rate of the forest.

**Endemic Species:**

- **Taxus baccata L**, a **conifer native to the Himalayas**. The plant, known for **anti-cancerous properties,** starts flowering from March, when the peak fire season in Uttarakhand typically begins. A massive forest fire during the flowering season can severely impede propagation of the species.
- Fruiting in **Asparagus adscendensRoxb**, a native plant of the Himalayas **used for vigour and vitality,** also occurs in March. A forest fire can damage its mature fruits and hinder fruiting. Researchers have already recorded scarce germination of the plant because of forest fires.
- **B aristata**, whose roots, stem and leaves are used in the **treatment of various ailments**, is already at risk from overexploitation.
- **Stephania glabra** is another medicinal plant whose **tuber** is used in the treatment of **asthma, tuberculosis, dysentery, hyperglycemia, cancer, fever**, intestinal complaints, sleep disturbances and inflammation.

About Forest Fire: https://optimizeias.com/forest-fire-in-odisha/

### 74. Wildlife translocation programmes benefit if they incorporate human dimensions

**Context:** Efforts to translocate wildlife benefit if human-related factors, biological and environmental considerations are incorporated, according to a new study by the University of California-Berkeley (UCB).

**More on the News:**

- Wildlife translocation is the intentional movement of animals for conservation purposes. It has been used as a technique to mitigate the loss and depletion of endangered species.
- **Success of wildlife translocations hinges is coexistence** with people. Human dimensions are considered integral to the design, implementation and evaluation of wildlife translocations according to the IUCN Guidelines for Reintroductions and Other Translocations.
- However, despite the recognised importance of human dimensions, these **factors are still largely missing from many conservation initiatives**, according to the UCB study.
- The researchers synthesised information from case studies reported in the IUCN Global Re-Introduction Perspective Series to identify relationships between the inclusion of human dimension objectives in wildlife translocation efforts and programme outcomes.
- They **analysed 305 case studies** of wildlife translocations from seven IUCN reports published between 2008 and 2021.Of the 305 case studies, 127 case studies (42 per cent) included human dimension objectives when planning their translocation.
- The study found that **translocation efforts that included human dimension objectives** were significantly **more likely to have a positive outcome** than the translocation efforts that did not include human dimension objectives.
- Of the **six key strategies** the study identified for including human dimension objectives, **education was the most common, followed by engaging locals, providing economic benefits, increasing social tolerance, enforcing regulations and supplying cultural benefits**.

### 75. Close to 4,000 painted storks nesting in two A.P. villages

**Concept :**

- One of the largest flock of painted storks ( Mycterialeucocephala), approximately 4,000 birds, have made tall trees in Veepapuram and Venkatapuram villages in Andhra Pradesh.

**About Painted Storks**

- The **Painted Stork is a large wading bird in the stork family.** Their distinctive pink tertial (flight) feathers of the wing are pink and give them their name.
- The painted storks are usually **seen in the freshwater wetlands and occasionally in the coastal regions.**
- They are found in **Pakistan, India, Sri Lanka, Myanmar, Malaysia, Thailand and Vietnam.**
- The **International Union for Conservation of Nature (IUCN**) had categorized and evaluated these **stork species and** had listed **them as 'Near Threatened'.**
- These storks feed in groups, **wading in shallow waters and avoiding deeper waters.** They feed on small fish, frogs and reptiles.
- The breeding season extends from July to October in north India and November to March in south India.
- Though the population in India is considered secure, the **painted stork are near threatened in other countries due to poaching.**

## 76. Spot-Billed Pelican

**Context:** The island of Sriharikota serves as a barrier that shields a brackish water lagoon that we call the Pulicat lake. Being mostly off-limits to tourists because it is an ISRO launch site, this area is teeming with 76 species of water birds.

**Spot-Billed Pelican:**

- Spot-billed pelicans, also known **as grey pelicans**, are large waterbirds that are found in South and Southeast Asia. They are one of the eight species of pelicans found around the world.
- Spot-billed pelicans are found in a **variety of habitats including large rivers, lakes, swamps, and estuaries.** They prefer areas **with tall trees for nesting and shallow water for feeding**.
- These pelicans are **large birds, measuring around 140-160 cm in length** with a wingspan of 230-350 cm. They have grey and white feathers with a distinctive bright red spot on their bills.
- It is a **social species, living and travelling mainly in flocks**. Spot-billed pelicans are not graceful on land, but fly well and are strong swimmers.
- Spot-billed pelicans **feed primarily on fish, but may also eat crustaceans and amphibians**.
- **Conservation status:**
  - Spot-billed pelicans are listed as **Near Threatened** by the IUCN. Habitat loss, hunting, and pollution are major threats to their population.
  - The spot-billed pelican is **protected under the Wildlife Protection Act of India**, and is also listed under **Appendix II of CITES**.

**Pulicat Lake:**

- Pulicat Lagoon is the **second largest brackish water lagoon** in India, after Chilika Lake. It is present in the **Coromondal Region**e. Andhra Pradesh–Tamil Nadu Border.
- The **barrier island of Sriharikota separates** the lake from the Bay of Bengal and is home to the Satish Dhawan Space Centre.
- The lake encompasses the **Pulicat Lake Bird Sanctuary**.
- **Flamingo Festival is held every year**to promote tourism in Pulicatlake and Nellapattu. It has been organised for the past 12 years
- The primary inflows to the Pulicat Lake are Arani, Kalangi and Swarnamukhi.
- About **96% of the Pulicat Lake is present in Andhra Pradesh** while only 3% is present in Tamil Nadu.
- The **Buckingham Canal, a navigation channel, is part of the lagoon** on its western side.
- Pulicat Lake is **recognized as a Ramsar Site**, a wetland of international importance, since 2002.

# GEOGRAPHY

## 1. In Bison Hills, wedding bells fall silent as Konda Redditribals face 'cultural trauma'

- A **Konda Reddi tribal habitation** to be rehabilitated for the Polavaram irrigation project in Alluri Sitaramaraju district.
- Konda Reddi tribal community perform rituals that are associated with river Godavari, but with resettlement and rehabilitation the tribals are in a cultural shock.

**About Polavaram Project:**

- The present Polavaram Irrigation Project is a modified proposal of the Ramapada Sagar Project.
- It is an **under-construction multi-purpose irrigation National project on the Godavari River in Andhra Pradesh.**
- It will facilitate an **inter-basin water transfer from the Godavari River to the Krishna river** through its Right canal.
- Its reservoir spreads in parts of **Chhattisgarh and Orissa States also.**
- The project is a multipurpose major terminal reservoir project for the development of Irrigation, Hydropower and drinking water facilities.
- The project was started in 2008, accorded national status in 2014 in the Andhra Pradesh Bifurcation Act.
- The Andhra Pradesh government extended the completion date to the 2022 Kharif season.

**The Godavari River:**

- The Godavari is the **largest Peninsular River system.** It is also called the Dakshin Ganga.
- It rises in the Nasik district of Maharashtra and discharges its water into the Bay of Bengal.
- The Godavari basin extends over states of Andhra Pradesh, Chhattisgarh, Maharashtra, Telangana, Madhya Pradesh, Odisha, Karnataka, Puducherry.
- The Pravara, Manjira and Maner are right bank tributaries and the Purna, Pranhita, Indravathi and Sabari are important left-bank tributaries.

## 2. UN to start allowing deep sea mining operations from July

**Concept :**

- After two weeks of negotiations, the International Seabed Authority has decided that it will start taking permit applications in July from companies that want to mine the ocean's floor.
- The undersea mining will be conducted to extract key battery materials — cobalt**, copper, nickel, and manganese** — from potato-sized rocks called "polymetallic nodules" found at **depths of 4 kilometres to 6 kilometres.**
- The UN's decision to take deep-sea mining applications comes when there is no mining code in place.
- Several countries have insisted that industrial undersea mining should require strict rules.

**Deep Sea Mining**

- Deep sea mining is a **growing subfield of experimental seabed mining** that involves the retrieval of minerals and deposits **from the ocean floor found at depths of 200 metres (660 ft), up to 6,500 metres (21,300 ft).**
- **Where are the deep-sea minerals located?**
- The deep sea contains three **primary sources for mining critical minerals:**
- Potato-size **manganese nodules** (rich in manganese, cobalt, copper, nickel, and rare earth elements);
- **Deposits of sulfur-containing minerals** around underwater openings known as hydrothermal vents; and
- **Cobalt-rich crusts** lining the sides of mid-ocean ridges and underwater mountains, also known as seamounts.
- The majority of proposed deep sea mining sites are near of polymetallic nodules or active and extinct hydrothermal vents at 1,400 to 3,700 metres below the ocean's surface.
- The vents create globular or massive sulfide deposits, which contain valuable metals such as silver, gold, copper, manganese, cobalt, and zinc.
- The deposits are mined using either hydraulic pumps or bucket systems that take ore to the surface to be processed.
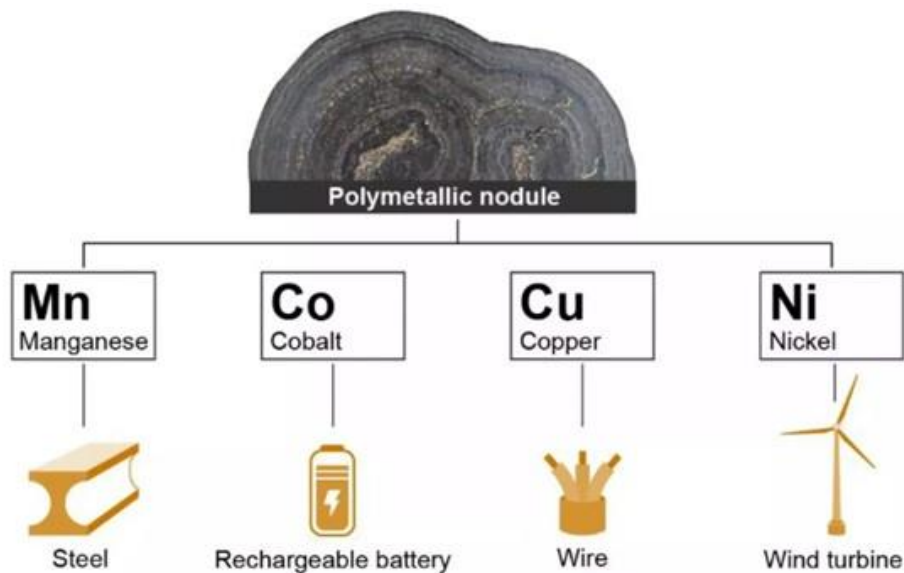
Sources: GAO; Smithsonian (image); United States Geological Survey. | GAO-22-105507

Figure 1. Cross-section of a polymetallic nodule, approximately 1 to 4 inches in diameter, showing the critical minerals that can be found within the nodule, and their applications.

**Note :**

- The **Clarion-Clipperton Zone** that spans 1.7 million square miles between **Hawaii and Mexico, and it is a potential hotbed for critical minerals.**
- The **Clipperton Fracture Zone**, is a **geological submarine fracture zone of the Pacific Ocean, with a length of around 4500 miles** (7240 km). The fracture, an unusually mountainous topographical feature, begins east-northeast of the Line Islands and ends in the Middle America Trench off the coast of Central America.
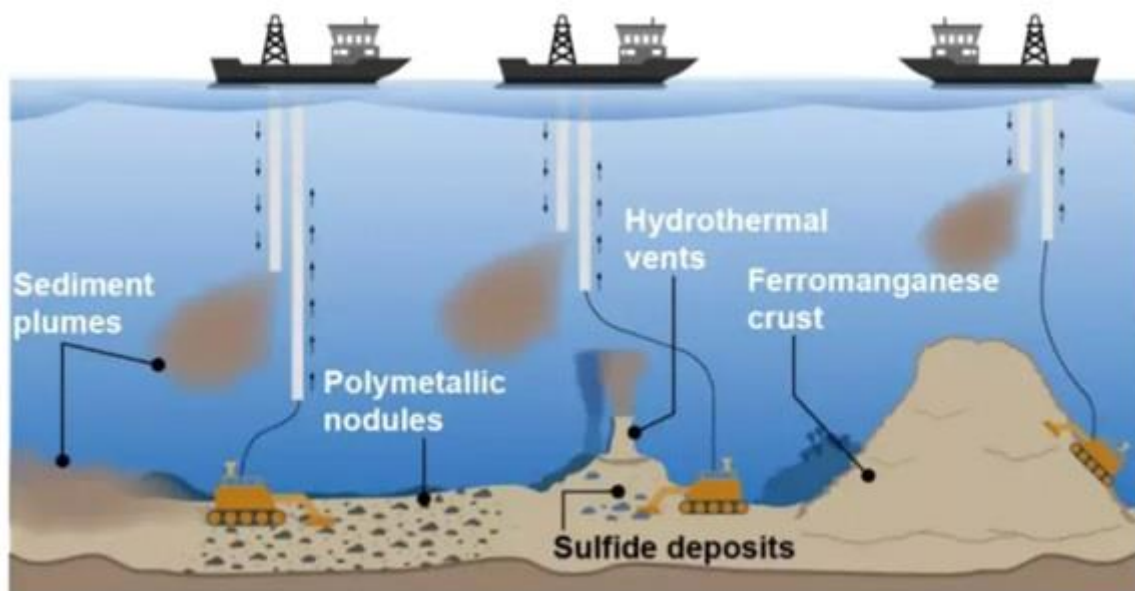


Source: GAO analysis of peer reviewed journal articles. | GAO-22-105507

**Concern:**

- The draft decision of ISA's governing council allows companies to file permit applications from July 9.
- In the absence of a mining code, which has been under discussion for nearly 10 years, the 36-member council is uncertain about the process it should adopt for reviewing applications for mining contracts.

**Mining Code/ Regulatory Framework**

- The mining code currently under development lacks sufficient knowledge of the deep sea and a thorough assessment of environmental impacts of mining operations that are necessary to ensure effective protection of deep-sea life, according to IUCN experts.

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- An effective regulatory framework is needed to avoid lasting harm to the marine environment, based on high-quality environmental impact assessments and mitigation strategies.
- These, in turn, must be based on comprehensive baseline studies to improve the understanding of the deep sea, which remains understudied and poorly understood.

## United Nations Convention On The Law Of The Sea (UNCLOS)

- The United Nations Convention on the Law of the Sea (UNCLOS), also called the Law of the Sea Convention or the Law of the Sea Treaty, is an **international agreement that establishes a legal framework for all marine and maritime activities**.
- 167 countries and the European Union are parties to the convention.
- UNCLOS came into force in 1994.
- It **lays down a comprehensive regime of law and order in the world's oceans and seas** establishing rules governing all uses of the oceans and their resources.

## 3. Seven tourists killed as avalanche hits roadfromGangtoktonkatsu La

**Context**: An avalanche at Thulokhola on the Nathula Road connecting Sikkim's capital Gangtok with the strategic Nathula Pass killed seven tourists on April 4, 2023, the district collector of Gangtok told journalists. The dead include four men, two women and a child from Nepal, Uttar Pradesh and West Bengal.

## What are Avalaches?

- Avalanche is a rapid downslope movement of a large detached mass of snow, ice, and associated debris such as rocks and vegetation.
- Small avalanches, or Sluffs, occur in large numbers, while large avalanches that may encompass slopes a kilometer or more in length with millions of tons of snow, occur infrequently but cause most of the damage.
- Humans have been exposed to the threat of sliding snow for as long as they have inhabited mountainous regions.

## Types of Avalanches:

- Loose snow avalanches-formed in snow with little internal cohesion among individual snow crystals.
- Slab avalanches-Originate in snow with sufficient internal cohesion to enable a snow layer, or layers, to react mechanically as a single entity.
- Wet snow avalanches-These move more slowly than dry ones and are seldom accompanied by dust clouds.
- Direct action avalanches –These are the immediate result of a single snowstorm. They usually involve only fresh snow.
- Climax avalanches-Result of a series of snowstorms or a culmination of weather influences. Their fall is not necessarily associated with a current storm or weather situation.

## Nathu la:

Nathu La, one of the highest motorable roads in the world, is a mountain pass in the Himalayan peaks that co-joins Sikkim and China. Situated on the Indo-Tibetan border 14450 ft. above sea level, Nathu La is one of the most important Himalayan passes in the country. Nathu means 'listening ears', and La means 'pass'. Nathu La is one of the three open trading border posts between India and China and is famous for its picturesque beauty and beautiful environment. The temperature here remains low for most parts

Located on the Old Silk Route, Nathu La Pass connects Sikkim to China's Tibet Autonomous Region. It was sealed for almost 4 decades after the People's Republic of China suppressed a Tibetan uprising in 1959. However, when the former Prime Minister of India, Atal Bihari Vajpayee visited China in 2003, talks to open the strategic route were resumed. The Nathu La Pass was reopened in 2006 and since then, it has served as an official Border Personnel Meeting(BPM) Point.

Since it is one of the three open trading border posts between India and China, Nathu La Pass has played a key role in the Sino-Indian Trade. It has also shortened the distance between the important Buddhist and Hindu pilgrimage sites, thus strengthening the economy and improving border relations with China.

**4. Diamond Mining in Panna**

**Concept:**

- NMDC, the country's largest iron ore miner, reportedly hopes to rope in State Forest Research Institute (SFRI) at Jabalpur, to study tiger movement and other environmental factors **at Panna (in Madhya Pradesh), where it plans to resume diamond mining.**
- NMDC has written to the State Forest Research Institute (SFRI), Jabalpur for providing their consent and budgetary offer for conducting such studies in consultation with Panna Tiger Reserve and PCCF (WL) Bhopal.

**Panna Diamond Mines**

- For 3,000 years, India **was the only source of diamonds globally until diamond deposits were located in Brazil and South Africa.**
- Panna's mines have been supplying precious diamonds for thousands of years.
- In India, the state-controlled National Mineral Development Corporation (NMDC) is the only organised producer of diamonds from its **Majhgawan mine in the Panna region.**
- **Majhgawan mine** is the only Diamond mine in Asia.
- **NDMC Panna is the only diamond mine in the country with more than 74 hectares of mechanised mining**.
- However, small mines of Panna are open cast mines that use traditional techniques and hand tools. Most of them are operated illegally.

**Tiger reserve v/s mining**

- The Panna Tiger Reserve (PTR) is one of the most critical habitats of tigers in India.
- In 2009, there were no tigers left in the PTR but after a series of measures now, the tiger reserve has around 50 tigers in it.
- For protecting the tiger habitat, authorities are curbing mining activities in the forest by imposing fines.
- The NMDC's diamond mine is also under pressure to phase out its operation. The operation was suspended as the mine's environmental clearance came to an end on December 31, 2020, but later resumed after state government intervention.

**About Panna Tiger Reserve:**

- The Panna tiger reserve is **situated in the Vindhya Mountain range** in the northern part of Madhya Pradesh.
- **Ken river (a tributary of the Yamuna River) flows through the reserve.**
- The region is also famous for Panna diamond mining.
- **Ken-Betwa River interlinking project** will be located within the tiger reserve.
- As of 2021, the reserve has a population of around 50 tigers, and efforts are being made to increase this number.



The Ken-Betwa River Linking Project

**5. Unseasonal rain is a natural calamity: Maharashtra**

**Concept :**

- In a move to provide relief to affected farmers, the Maharashtra cabinet said unseasonal rains will be considered a natural calamity in the state.

**Background**

- Crops of several farmers were damaged in unseasonal rains and hailstorms in Maharashtra last month. The Opposition had demanded that the state government give immediate relief to the affected farmers.

**How does the Law define a Disaster?**

- Disaster Management Act, 2005 defines a 'disaster' **as a catastrophe, mishap, calamity or grave occurrence in any are**a – arising from natural or man-made causes, or by accident or negligence.

- A **natural disaster includes earthquake, flood, landslide, cyclone, tsunami, urban flood, heatwave**; a man-made disaster can be nuclear, biological and chemical.
- It results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.

**Provisions to Classify a National Calamity**

- There is **no provision, executive or legal, to declare a natural calamity as a national calamity.**
- The **existing guidelines of the State Disaster Response Fund (SDRF)/ National Disaster Response Fund (NDRF), do not contemplate declaring a disaster as a 'National Calamity."**

**Earlier Attempts in this Direction**

- The **10th Finance Commission (1995-2000)** examined a proposal that a disaster is termed "a national calamity of rarest severity" if it affects one-third of the population of a state.
- The panel did not define a "calamity of rare severity" but stated that a calamity of rare severity would necessarily have to be adjudged on a case-to-case basis taking into account.
- The intensity and magnitude of the calamity
- Level of assistance needed
- The capacity of the state to tackle the problem
- The alternatives and flexibility were available within the plans to provide succour and relief, etc.
- In **2001, the National Committee on Disaster Management** under the chairmanship of the then Prime Minister was mandated to look into the parameters that should define a national calamity.
- However, the committee did not suggest any fixed criterion.

**Local Disaster:**

- A **State Government may use up to 10 per cent of the funds available under the SDRF** for **providing immediate relief to the victims of natural disasters that they consider to be 'disasters' within the local context in the State** and **which are not included in the notified list of disasters of the Ministry of Home Affair**s subject to the condition that the **State Government has listed the State-specific natural disasters** and **notified clear and transparent norms and guidelines for such disasters with the approval of the State Authority, i.e., the State Executive Authority (SEC).**

**6. BRO working on strategic infra projects to aide Bhutan's growth**

After taking up daunting projects in the higher reaches, the Border Roads Organisation (BRO) is executing strategic infrastructure assignments in Bhutan to aid its development.

The initiatives assume importance given that Bhutan and China are also in talks over boundary issues especially near Doklam trijunction point which came up for discussion during Prime Minister Narendra Modi's meeting with the visiting Bhutanese King Jigme KhesarNamgyelWangchuck, earlier this week.

The BRO has commenced three projects in South Eastern Bhutan since last year. These include the rehabilitation of Khothakpa–Tshobaley road, construction of 68-km greenfield Nanglam–Dewathang road, besides development of Motanga industrial park.

**7. Cannabis cultivation**

**Concept :**

- Recently, a five-member committee of MLAs has been formed by the state government of Himachal Pradesh to conduct a thorough study of cannabis cultivation and submit a report within a month.

**About Cannabis Cultivation:**

- **Cannabis** refers to a **group of three plants with psychoactive properties**, known as Cannabis sativa, Cannabis indica, and Cannabis ruderalis.
- Cannabis is made up of more than 120 components, which are **known as cannabinoids** but experts have a pretty good understanding of two of them, **known as cannabidiol (CBD) and tetrahydrocannabinol (THC).**
- The Mexican term '**marijuana' is frequently used in referring to cannabis leaves** or other crude plant material in many countries.
- The unpollinated female plants are called hashish. Cannabis oil (hashish oil) is a concentrate of cannabinoids obtained by solvent extraction of the crude plant material or of the resin.
- In **India farming of cannabis has been legalised in Uttarakhand, and controlled cultivation of cannabis is also being done in some districts of Gujarat, Madhya Pradesh and Uttar Pradesh.**

**Legal Provisions in India**

- The central law that deals with cannabis (weed or marijuana) in India is the **Narcotic Drugs and Psychotropic Substances Act, of 1985.**
- The NDPS Act **prohibits the sale and production of cannabis resin and flowers**, but the **use of leaves and seeds of the cannabis plant is permitted**
- The **states have the power to regulate and form the state rules for it.**

**7. India decommission ageing dams**

**Context:** Dams have affected new ways of land use and life so much that many societies cannot think of a life beyond them anymore
**More on the News:**

- Dams, especially the large ones, are **highly controversial** in India. But **the dependence of urban communities on embankments makes it challenging to decommission** the ones that have aged or might cause more damage.

- Dams have **destroyed vast swathes of natural forests, displaced millions of people, fuelled inter-state conflicts**, and are methane-emitting culprits and so on. But they have also changed the world order for Indian civilisations by evolving new ways of farming, urbanisation and industrialisation.
- This is the reason for the poor response from people when the Parliamentary Standing Committee on Water red-flagged dam safety issues in a report on March 20.
- The Parliamentary Committee has raised concerns over the **safety of ageing dams** that are more than 100 years old. Of the 5,745 large dams in the country, 5,334 are operational. Of these operational embankments, 2**34 have outlived their lifespan of 100 years.** Some are even older than 300 years.

## Dam Rehabilitation and Improvement Project (DRIP)

- Dam Rehabilitation and Improvement Project (DRIP) is a **project launched by the Government of India in 2012** with the **aim of rehabilitating and improving the safety and operational performance of selected dams** in India.
- DRIP Phase II is co-financed by **World Bank (WB) and Asian Infrastructure Investment Bank (AIIB)** with US$250 million each.
- It is being **implemented by the Central Water Commission** (CWC) in association with the concerned state governments.
- The project aims to **rehabilitate and improve the safety and operational performance** of 223 dams in seven states – Kerala, Madhya Pradesh, Odisha, Tamil Nadu, Karnataka, Uttarakhand, and Jharkhand.
- A web-based tool called **Dam Health and Rehabilitation Monitoring Application (DHARMA)** has been developed to **capture important data for all dams** and use it for appropriate monitoring and development of rehabilitation protocols.
- Based on the success of DRIP, the **Ministry of Jal Shakti** initiated another externally funded Scheme DRIP Phase II and Phase III.
- The project includes the rehabilitation and improvement of the dam's structural and non-structural components, including spillway gates, embankments, and sluices.
- The project also focuses on the **strengthening of institutional capacities** and the improvement of dam safety monitoring, emergency management, and community-based disaster risk management.
- DRIP is a significant **step towards ensuring the safety and sustainability** of India's dams, which play a crucial role in the country's water management and power generation.

## Dam Safety Act, 2021:

- An Act to provide for the **surveillance, inspection, operation, and maintenance of the specified dam** for prevention of dam failure related disasters and to **provide for an institutional mechanism** to ensure their safe functioning and for matters connected therewith or incidental thereto.
- **Features of the act:**
  - The **National Committee on Dam Safety** will be constituted and will be chaired by the chairperson, Central Water Commission.
  - **Functions** of the committee will **include formulating policies and regulations regarding dam safety standards and prevention of dam failures**, analyzing the causes of major dam failures, and suggesting changes in dam safety practices.
  - **National Dam Safety Authority** (NDSA) to be headed by an officer, not below the rank of an Additional Secretary, to be appointed by the central government.
  - The **main task of this authority includes implementing the policies formulated** by the National Committee on Dam Safety, resolving issues between State Dam Safety Organisations (SDSOs), or between an SDSO and any dam owner in that state, specifying regulations for inspection and investigation of dams.
  - The NDSA will also provide accreditation to agencies working on construction, design, and alteration of dams.
  - The act also envisages **constituting a State Dam Safety Organisation** (SDSO) whose functions will be to **keep perpetual surveillance, inspection, monitoring the operation and maintenance of dams**, keeping a database of all dams, and recommending safety measures to owners of dams.
  - The owners of the specified dams are required to provide
- A **dam safety unit in each dam** to inspect the dams before and after the monsoon session, and during and after any calamity or sign of distress.
- An **emergency action plan,** and **carry out risk assessment** studies for each dam at specified regular intervals.
- A **comprehensive dam safety evaluation** of each dam, at regular intervals, through a panel of experts.

## Facts for Prelims:

- **Oldest Dam** in India Kallanai Dam(Tamil Nadu)
- **Highest Dam** in India Tehri Dam (Uttarakhand)
- **Longest Dam** in India Hirakud Dam (Odisha)
- India ranks **third globally after China and the United States of America**, with 5334 large dams in operation.

## 8. Taiwan Strait

**Concept:**

- Taiwanese President U.S. visit prompts military drills by China in Taiwan Strait.
- **Taiwan Strait**
- The **Taiwan Strait is a 180-kilometer** (110 mi)-wide strait **separating the island of Taiwan and continental Asia.**
- The strait is **part of the South China Sea and connects to the East China Sea to the north.**
- Former names of the Taiwan Strait include the **Formosa Strait or Strait of Formosa**, from a dated name for Taiwan; the Strait of Fokien or Fujian, from the Chinese province forming the strait's western shore; and the Black Ditch, a calque of the strait's name in Hokkien and Hakka.
- The **entire strait is on Asia's continental shelf**.



## 9. SC lets Vedanta open Thoothukudi copper plant for upkeep

**Sterlite's product**

- Sterlite's product, **copper, is a strategic metal.**
- Important **applications are energy, electrical equipment and electronics.**
- Nations are switching more and more to wind and solar. This means new projects and transmission lines. There is a push for electrical vehicles.
- Globally, and in India, copper demand is only set to ramp up. Imports can cause supply bottlenecks. End consumers such as electrical equipment manufacturers sometimes pay a high premium as a result.
- Copper production provides strategic balance and price stability. The **shuttering of the Sterlite plant quickly made India, a copper exporter, an importer.**
- **A copper smelter would serve India well. The only other major smelter in India is Hindalco.**

**Copper:**

Copper is a soft, malleable, and ductile metal with very high thermal and electrical conductivity. copper is one of the few metals that occurs in nature in directly usable metallic form (native metals) and is an important non-ferrous base metal having wide industrial applications, ranging from defence, space programme, railways, power cables, mint, telecommunication cables, etc. India is not self-sufficient in the production of copper ore. In addition to domestic production of ore and concentrates, India imports copper concentrates for its smelters. The domestic demand for copper and its alloys is met through domestic production, recycling of scrap and by imports. Hindustan Copper Limited (HCL), a Public Sector Undertaking, is the only integrated company in the country that is involved in mining & beneficiation of ore and is engaged in smelting, refining and casting of refined copper. Hindalco Industries Ltd and Vedanta Limited are the major copper producers in the Private Sector that mainly rely on imported copper concentrates. These companies own copper mines in other countries.

**Reserves**

The total reserves/resources of copper ore as on 1.4.2015 as per NMI database based on UNFC system are estimated at 1.51 billion tonnes. Of these, 207.77 million tonnes (13.74%) fall under 'reserves category' while the balance 1.30 billion tonnes (86.25%) are 'remaining resources' category. Gradewise there are no reserves with 1.85% or more copper grade. However, 203.83 million tonnes reserves fall under 1% to below 1.85% Cu grade. Of the total ore resources 8.28 million tonnes (0.55%) comprise ore containing 1.85% Cu or more and 657.92 million tonnes (43.53%) resources fall under 1% to below 1.85% Cu grade. The total metal content out of the total copper resources is 12.16 million tonnes of which 2.73 million tonnes constitute reserves. Largest reserves/resources of copper ore to a tune of 813 million tonnes (53.81%) are in the state of Rajasthan followed by Jharkhand with

295 million tonnes (19.54%) and Madhya Pradesh with 283 million tonnes (18.75%). Copper reserves/ resources in Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal accounted for remaining 7.9% of the total all India resources

**Famous mines:**

| Copper Mines | State |
|---|---|
| Malanjkhand Mine | Madhya Pradesh |
| Khetri Mine | Rajasthan |
| Banwas Mine | Rajasthan |
| Kolihan Mine | Rajasthan |
| Kendadih Mine, Ghatsila | Jharkhand |

## Pollution from copper smelters

- **Copper smelting plants separate elemental copper from copper concentrates through multiple sulphide oxidizing stages**
- Emissions from primary copper smelters are principally particulate matter and sulfur oxides (SOx). Emissions are generated from the roasters, smelting furnaces, and converters. Fugitive emissions are generated during material handling operations. Roasters, smelting furnaces, and converters are sources of both particulate matter and SOx.
- Copper and iron oxides are the primary constituents of the particulate matter, but other oxides, such as arsenic, antimony, cadmium, lead, mercury, and zinc, may also be present, along with metallic sulfates and sulfuric acid mist. Fuel combustion products also contribute to the particulate emissions from multiple hearth roasters and reverberatory furnaces.

## An opportunity: Way forward

- While the economic and national interest case for a copper smelter is proven, the trust deficit between Vedanta and the people of Thoothukudi needs to be bridged if the smelter has to restart.
- The framework for a solution **could focus on adherence to norms and creating harmony between the company, government and the people.**
- **Sterlite presents an opportunity for the people of Thoothukudi to move forward in national and local economic interest.**
- It is an opportunity for a corporate group to act responsibly and take people along while conducting its business.

## 10. Eswatini

**Concept :**

- Five years ago, the King of Swaziland renamed his country "Eswatini".

**About Eswatini**

- Eswatini is **officially known as the Kingdom of Eswatini**, sometimes written in English as eSwatini, and formerly and still commonly known in English as
- Eswatini is a **landlocked country in Southern Africa**. It is **bordered by Mozambique to its northeast and South Africa to its north, west, and south.**
- The population is composed primarily of ethnic Swazis.
- The government is an absolute monarchy, ruled by King Mswati III since 1986. Elections are held every five years to determine the House of Assembly and the Senate majority.

**11. Our worst nightmares have come true: Kin of mountaineer missing in Nepal**

**Context:**

- Mountaineer Anurag Maloo, who had scaled several peaks before, went missing in the mountains of Nepal.

**Details:**

- He had gone to scale **Mt Annapurna peak** and was at **Camp III**. Due to his health condition, he was asked to descend instead. While coming down, he slipped and fell in a crevasse between Camp III and Camp II.
- Baljeet Kaur, Pakistani climbers Shehroze Kashif, NailaKiani and Indian climber Arjun Vajpai were evacuated from Camp IV, while Nepal Army Captain Suman Panday, who suffered from snow blindness at Camp III, has also been evacuated to Kathmandu.
- Noted Irish climber Noel Hanna, 56, who has scaled Mount Everest 10 times, died on his way down from the summit.

**About Mount Annapurna:**

- Annapurna is a mountain **situated** in the**Annapurna mountain range of Gandaki Province, north-central Nepal.**
- It is the **tenth highest mountain in the world** at **8,091 metres (26,545 ft) above sea level** and is well known for the difficulty and danger involved in its ascent.
- As of 2022, 365 people had reached the summit of Annapurna I, while 72 had died in the attempt.
- **Annapurna I was the first 8,000-metre (26,200 ft) peak to be climbed.**

**Top10 mountain peaks of the world:**

| Mountain peak | Description |
|---|---|
| **Mount Everest** | **Prominence:** 8,848.86 m (29,031.7 ft)<br>**Isolation:** 40,008 km (24,860 mi)<br>**Mount Everest** is the **highest mountain on the Earth above sea level** and is located in the **MahalangurHimal sub-range** of the Himalayas.<br>The **China–Nepal border runs across its summit point.** |
| **K2 or Mount Godwin Austen** | **Elevation:** 8,611 m (28,251 ft) |

| | |
|---|---|
| | **Prominence:** 4,020 m (13,190 ft)<br>**Isolation:** 1,316 km (818 mi)<br>**K2 or Mount Godwin Austen** is the **second-highest mountain in the world**, after **Mount Everest** above sea level.<br>It is **located on the China–Pakistan border** between **Baltistan in the Gilgit-Baltistan region of northern Pakistan, and Dafdar Township in Taxkorgan Tajik Autonomous County of Xinjiang, China**.<br>It is the highest point of the **Karakoram mountain range** and the highest point in both Pakistan and Xinjiang. |
| **Kangchenjunga** | **Elevation:** 8,586 m (28,169 ft)<br>**Prominence:** 3,922 m (12,867 ft))<br>**Isolation:** 124 km (77 mi)<br>**Kanchenjunga** is the **third highest mountain** in the world above sea level. It **lies between Nepal and Sikkim, India,** with three of the five peaks (Main, Central, and South) directly on the border, and the remaining two (West and Kangbachen) in Taplejung District, Nepal. |
| **Lhotse** | **Elevation:** 8,516 m (27,940 ft<br>**Prominence:** 610 m (2,000 ft)<br>**Isolation:** 2.66 km (1.65 mi)<br>**Lhotse** is the **fourth highest mountain** in the world above sea level. It is located on the **border between TAR, China and the Khumbu region of Nepal.** |
| **Makalu** | **Elevation:** 8,463 m (27,766 ft)<br>**Prominence:** 2,386 m (7,828 ft)<br>**Isolation:** 17 km (11 mi)<br>**Makalu** is the **fifth highest mountain** in the world above sea level. It is located in the **Mahalangur Himalayas** (19 km South-East of Mount Everest) on the border between **Nepal and TAR, China.** |
| **Cho Oyu** | **Elevation:** 8,188 m (26,864 ft)<br>**Prominence:** 2,340 m (7,680 ft)<br>**Isolation:** 29 km (18 mi)<br>**Cho Oyu** is the **sixth highest mountain** in the world above sea level.<br>It is located on the **China-Nepal border.** It is the **westernmost major peak of the Khumbu sub-section** of the **Mahalangur Himalayas** (20 km West of Mount Everest). |
| **Dhaulagiri** | **Elevation:** 8,167 m (26,795 ft)<br>**Prominence:** 3,357 m (11,014 ft)<br>**Isolation:** 318 km (198 mi)<br>**Dhaulagiri** is the **seventh highest mountain** in the world above sea level, and the **highest mountain within the borders of a single country (Nepal).**<br>It is bounded on the north and southwest by tributaries of the Bheri River and on the southeast by the MyagdiKhola. Its parent peak is K2. |
| **Manaslu** | **Elevation:** 8,163 m (26,781 ft)<br>**Prominence:** 3,092 m (10,144 ft)<br>**Isolation:** 106 km (66 mi)<br>**Manaslu** is the **eighth-highest mountain** in the world above sea level.<br>It is located in the **MansiriHimal,** part of the **Nepalese Himalayas.**<br>It is said that **'just as the British consider Everest their mountain, Manaslu has always been a Japanese mountain'**. |
| **Nanga Parbat** | **Elevation:** 8,126 m (26,660 ft)<br>**Prominence:** 4,608 m (15,118 ft)<br>**Isolation:** 189 km (117 mi)<br>**Nanga Parbat** is the **ninth highest mountain** in the world above sea level.<br>It is located in the **Diamer District of Gilgit-Baltistan region, Pakistan**, **Nanga Parbat** is the western anchor of the Himalayas. |
| **Annapurna** | **Elevation:** 8,091 m (26,545 ft)<br>**Prominence:** 2,984 m (9,790 ft)<br>**Isolation:** 34 km (21 mi) |

| | | **Annapurna** is the **tenth highest mountain** in the world above sea level.<br>It is **located** in the **Himalayas in north-central Nepal** and is bounded by the **Kali Gandaki Gorge on the west,** the **Marshyangdi River on the north and east,** and by **Pokhara Valley on the south.**<br>Its parent peak is Cho Oyu. |

**Highest Peaks in India: Top 10**

| Mountain Peak | Height (in meters) | Main Points |
|---|---|---|
| **K2 (Godwin-Austen)** | 8611 | The highest peak in Indian subcontinent lies between Baltistan and Xinjiang and the second highest summit in the World. |
| **Kangchenjunga** | 8586 | The highest peak in India & the third highest summit in the World.<br>Also known as the 'five treasures of snow' |
| **Nanda Devi** | 7816 | It is the second-highest peak in India and is ranked the 23rd highest peak across the world.<br>The Nanda Devi National Prak, located in vicinity to the peak, consists of the best high altitude flora and fauna.<br>This is the highest peak located entirely in India |
| **Kamet** | 7756 | The third highest peak in the country but not as accessible as others due to its location.<br>It is located near the Tibetan Plateau |
| **Santoro Kangri** | 7742 | It is located near the Siachen Glacier, one of the longest glaciers in the world.<br>The Santoro Kangri is ranked the 31st highest independent peak in the world. |
| **Saser Kangri** | 7672 | Located in Jammu and Kashmir, it is a group of five majestic mountain peaks<br>This mountain peak is the 35th highest mountain peak in the world. |
| **Mamostrong Kangri** | 7516 | It is located near a remote area of Siachen Glacier<br>It is the 48th independent peak in India |
| **Rimo** | 7385 | The Rimo is a part of the Great Karakoram ranges.<br>It is the 71st highest peak in the world. |
| **Hardeol** | 7151 | This peak is also known as the 'Temple of God'<br>It is one of the oldest summits in the Kumaon Himalaya |
| **Chaukamba** | 7138 | It is located in the Garhwal district of Uttrakhand.<br>It is a part of the Gangotri Group of ranges which includes a total of four peaks |
| **Trisul** | 7120 | The name of this mountain peak is taken from the weapon of Lord Shiva.<br>It is one of three mountain peaks located in the Kumaon Himalaya in Uttrakhand. |

**12. El Niño is coming and Ocean Temperature are already at record highs**

<u>Context:</u> El Niño tends to trigger intense and widespread periods of extreme ocean warming known as marine heat waves.
**More on the News:**

- By July, most forecast models agree that the climate system's biggest player – El Niño – will return for the first time in nearly four years.
- El Niño can also **wreak havoc on the many marine ecosystems** that support the world's fishing industries, including **coral reefs and seagrass meadows**.
- El Niño tends to **trigger intense and widespread periods of extreme ocean warming** known **as marine heat waves**.
- Marine heat waves also **unfold along the seafloor of coastal regions**.
- In the **Bay of Bengal** east of India, **interactions between El Niño and a tropical air flow pattern known as the Walker Circulation elevate the risk** for marine heat waves.

**Marine Heatwaves:**

- Heatwaves are **periods of extreme warmth** when **temperatures rise beyond the normal range** for at least two consecutive days or nights.

**Formation of Marine Heatwaves:**

- Marine heat waves form much **like land-based ones**: **weather systems intensify over time**, **leading to extremely high temperatures over large ocean surface areas**.
- But there are key differences between them that drive their formation processes:
  - **Land-based heat waves depend on atmospheric conditions** like high-pressure systems (anticyclones) over land masses such as continents or oceans that block cold air from reaching those areas.
  - **Marine heatwaves are periods when sea surface temperature reaches extreme levels for an extended period**, sometimes lasting weeks or months. These events occur in various ocean regions and can be caused by natural variability or human-induced climate change.

## Causes of Marine Heatwaves:

- The main cause of marine heat waves is the increase in ocean temperature **due to the absorption of greenhouse gases** from the atmosphere, which leads to global warming.
- Natural climate variability can also contribute to marine heat waves, including **changes in ocean currents, weather patterns, and atmospheric circulation.**
- **El Niño-Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD)** can contribute to the occurrence of marine heat waves.

## Impacts of Marine Heatwaves

- **Coral bleaching**: Marine heatwaves can **lead to coral bleaching**, which is the loss of **photosynthetic algae, called zooxanthellae**, from the coral. This can ultimately lead to the death of coral.
- **Ocean acidification:** Marine heatwaves can exacerbate ocean acidification, which is the **increase in acidity of seawater** due to the absorption of carbon dioxide from the atmosphere. This can have negative impacts on marine organisms that build shells or skeletons out of calcium carbonate, such as corals and some types of plankton.
- **Harmful algal blooms**: Marine heatwaves can cause harmful algal blooms, which can **produce toxins** that are harmful to humans and marine life.
- **Ocean circulation**: Marine heatwaves can also affect ocean circulationby **altering the temperature and density of ocean water**, which can have implications for ocean currents and the transport of nutrients and heat around the globe.
- **Marine biodiversity:** Marine heatwaves can **affect the composition and abundance of marine specie**s, leading to changes in marine biodiversity.

El Nino: https://optimizeias.com/el-nino-and-india/

## 13. India underestimating heatwave impact

**Context:** Climate experts and policymakers should re-evaluate the metrics for assessing the country's climate vulnerability as heatwaves in India and the Indian subcontinent become recurrent and long-lasting.

## More on the News:

- India has been underestimating the impact of heatwaves on its development. More than **90 per cent of the country is at risk of suffering losses** in livelihood capacity, food grains yields, vector-borne disease spread and urban sustainability.
- The **government's estimate is from the National Climate Vulnerability Index** (CVI), developed by the Department of Science and Technology.
- CVI is a composite index that **uses various indicators to evaluate climate impact** on India's socio-economic features and livelihood, biophysical, institutional and infrastructural characteristics.
- CVI is a robust metric. But it **underestimates the vulnerability from heatwaves** as it does **not include any physical risk factors from extreme heat**, according to a new study by the University of Cambridge.
- Climate experts **and policymakers should re-evaluate the metrics for assessing the country's climate vulnerability** as heatwaves in India and the Indian subcontinent become recurrent and long-lasting, they added.

## 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**.

## 14. Buoyant history afloat on a neglected boat in Bengal

**Context:**

- The **wooden boats** on the bank of the **Rupnarayan river** near **Tamluk (the ancient port town of Tamralipta)** has inspired an **international project** viz. **The Chhotbuilders of West Bengal Project:** Documenting the vanishing craft knowledge of a unique boat-building tradition.

**Details about the project:**

- **Project is a collaboration between** University of Exeter, **United Kingdom** and the Central University of Haryana, **India.**
- The boat-makers near DihimandalGhat were commissioned to build the boat last year.
- The boats will be kept at the Maritime Museum at Lothal.

**Chhot (boats):**

- Chhot means 'to run' in bengali language.
- The knowledge of boat-making has been passed to us by our forefathers.
- The boat is completely different and superior to the L-shaped boats and dinghy boats in use now.
- The boat is around **37-foot-long** and **9.5-foot-wide V-shaped** wooden structure.

**Other famous boatcarft in India:**

- Recently, the District Tourism Promotion Council, **Kozhikode** has applied for a **Geographical Indication (GI) tag** for the famous **BeyporeUru (boat).**
- The **Beypore Urus** are a **symbol of Kerala's trade relations** and friendship with the **Gulf countries.**
- The prominent people associated with Uru-making are **Odayis** and **Khalasis**.

**Rupnarayan river:**

- The **Rupnarayan River** is a river in India.
- It begins as the **Dhaleswari (Dhalkisor)** in the **Chhota Nagpur plateau foothills** northeast of the town of **Purulia.**
- It then follows a tortuous southeasterly course past the town of **Bankura,** where it is known as the **Dwarakeswar river.** Near the town of **Ghatal** it is **joined by the Shilabati river**, where it takes the name **Rupnarayan.**
- **Finally, it joins the Hoogli River.**
- It is **famous for the Hilsa fish** that live in it and are used in Bengali cuisine.
- It is also **notable for the West Bengal Power Development Corporation Limited (WBPDCL) thermal power plant** built along its bank at **Kolaghat** in West Bengal.
- The river also passes through **Bagnan in Howrah district**.
- Rupnarayan River forms the eastern boundary of district **Purba Medinipur** with district **Howrah**.

## 15. Heat Dome

**Context:** 'Heat domes' have also been associated with unusually warm periods in India, Bangladesh, China and some other Asian countries.

**More on the News:**

- Places across the southwest and eastern parts of the United States **recorded temperatures as warm** as those seen in late June or early July, and the **unusual warming was caused by a phenomenon known as 'heat domes'**
- 'Heat domes' are **natural phenomena** that have also been **associated with unusually warm periods in India, Bangladesh, China** and some other Asian countries.
- This season's first heat dome set off heatwaves in as many as 48 states in the US and fears of wildfires loom large.
- Over the years, heat domes have **created some of the most fatal heat waves** in North America, among other regions. **Creating records for some of the highest temperatures ever recorded in the continent,** these waves have caused thousands of deaths.
- Stopping heat domes from forming altogether is not possible, as they are a natural weather phenomenon. But as the **threat of climate change continues to creep up, heat domes are getting more intense.**

**Heat Dome:**

- A heat dome is a **type of high-pressure system** that forms **over a large area** in the atmosphere, and **causes extremely hot and dry weather conditions**. The system **traps hot air and prevents it from flowing to rise and cool**.
- This air then becomes **compressed and heats up**, leading to a **dome-shaped area** of hot **air that can persist** for several days or even weeks.
- Heat domes can **cause dangerous heat waves causing the temperatures to shoot up**.
- **Due to climate change**, heat domes have **not only become more frequent but also a lot more intens** The rising temperatures and changes in weather patterns are creating conditions that are assisting their formation.

## How a heat dome forms

**2** High pressure in the atmosphere pushes the warm air down

**1** A mass of warm air builds up in still and dry summer conditions

**3** The air is compressed and gets even hotter

BBC
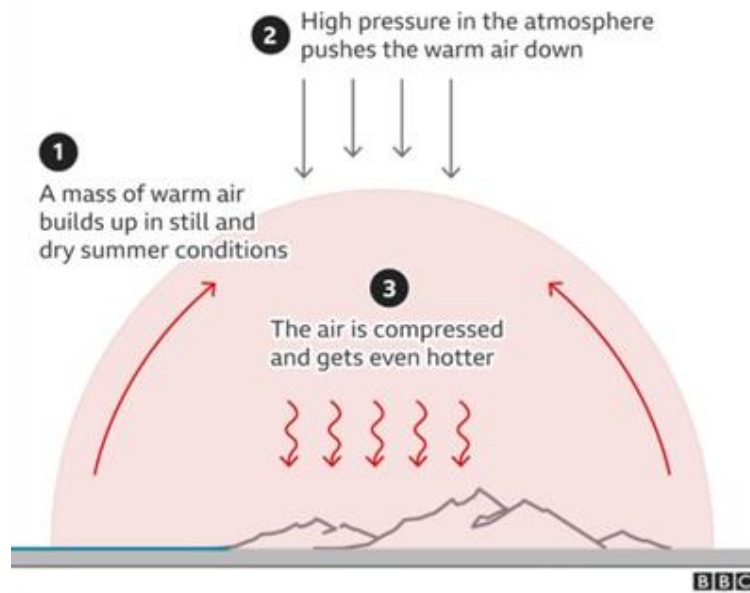
**Causes of Heat Dome:**

- **Change in Atmospheric Pressure:** Heat waves begin when **high pressure** in the atmosphere moves in and pushes warm air toward the ground.
    - High-pressure systems often **bring clear skies, which means there is less reflection of sunlight and more absorption of heat**. Locations with a lot of land and relatively dry air, such as **plains and deserts, serve as a favourable condition** for heat domes to form as well.
- **Change in Ocean Temperature:**
    - In the process known as **convection**, the **gradient causes more warm air**, **heated by the ocean surface**, to rise over the ocean surface.
    - As **prevailing winds move the hot air east**, the **northern shifts of the jet stream trap the air and move it toward land**, where it sinks, resulting in heat waves.
- **Climate Change**: Climate change has **led to warmer background temperatures**, **exacerbating the high-pressure system**.

**Impact of Heat Dome:**

- **Heat-related illnesses**: Heat domes can cause a spike in heat-related illnesses such as **heat exhaustion, heat cramps, and heatstroke**. Vulnerable populations such as the elderly, children, and those with pre-existing medical conditions are at a higher risk.
- **Wildfires**: The **high temperatures and dry conditions** caused by heat domes can increase the risk of wildfires. The heat can also **exacerbate the spread of fires**.
- **Crop damage**: Heat domes can **cause crop damage** due to high temperatures and drought conditions. This can **lead to lower crop yields** and economic losses for farmers.
- **Infrastructure damage**: High temperatures can cause damage to infrastructure such as **roads, buildings, and power lines**.
- **Water shortages**: Heat domes can lead to **drought conditions**, which can cause water shortages and impact water supplies for both people and wildlife.
- **Air pollution:** High temperatures can lead to **increased levels of air pollution**, which can exacerbate respiratory problems and other health issues.

**Combating Heat Dome:**

- **Reducing greenhouse emissions**: **Transitioning to renewable energy** sources, **improving energy efficiency and promoting sustainable transportation**, can be measures in achieving a reduction of greenhouse gas emissions, as it is critical to mitigating the impacts of heat domes in long terms.
- **Investing in green infrastructure**: Cities can invest in green infrastructure, such as **parks, green roofs, and tree planting**, which can help reduce the urban heat island effect and provide cooling benefits.
- **Implementing building codes and standards:** Building codes and standards can help ensure that new buildings are **designed to withstand extreme heat and maintain indoor comfort during heat waves.**
- **Reducing heat-trapping surfaces:** Cities can take steps to reduce the amount of heat-trapping surfaces, **such as asphalt and concret**e, which can exacerbate the urban heat island effect.

- **Enhancing public education and outreach:** Educating the public about the risks of extreme heat and how to **stay safe during heat waves** can help reduce the incidence of heat-related illness and mortality.

For, Relationship between heat domes and the jet stream https://optimizeias.com/what-is-causing-the-winter-heat-wave-in-europe/#:~:text=What%20is%20a%20heat%20dome,conditions%20with%20every%20passing%20day.

**16. India overtakes China, becomes most populous nation with 142.9 crore people**

**Context**: India has overtaken China as the most populous nation in the world, according to a report by the United Nations Population Fund. The report says 68 per cent of India's population is in the 15-64 age group.
**Demographic dividend**:
**What is demographic dividend?**
Demographic dividend means that the country's dependency ratio, as measured by the share of the young and the elderly as a fraction of the population, will come down more sharply in the coming decades. Increase in the share of working age population means more workers in the productive age groups that will add to the total output, generate more savings, accrue more capital per worker, and all these leading to higher economic growth.
**Issues:-**in reaping the demographic dividend

- **Learning loss due to the COVID pandemic**
- **Labour market imbalances** –due to shortage skill skilled labour and skill mismatch.. In 2019-20, only 73 million of India's 542 million strong workforce received any form of vocational training (whether formal or informal).
- The proportion of formally skilled workers as a percentage of total workforce stands at 24 per cent in China, 52 percent in USA, 68 per cent in UK and 80 per cent in Japan, against a paltry 3 per cent in India.

**Suggestions:**

- The report suggests that youth may be offered **skill vouchers and scholarships which can be linked to the national skill qualification framework.** Thus leading to a transformation from supply-based to demand-based skill system.
- The government should also consider setting up **multi skill training institutes in MSME clusters** to impart skills based on local demand.
- Corporate investment in employee education and training should continue to play a critical role to meet the demand for high-skilled workers. Thus, **greater government-industry collaboration** holds the key for skilling the burgeoning workforce.

**Concept:**
**Definition**
According to **United Nations Population Fund (UNFPA)**, demographic dividend means, "the economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population (15 to 64) is larger than the non-working-age share of the population (14 and younger, and 65 and older)".
With fewer births each year, a country's working-age population grows larger relative to the young dependent population. With more people in the labor force and fewer children to support, a country has a window of opportunity for economic growth if the right social and economic investments and policies are made in health, education, governance, and the economy.
**Causes**-Change in population structure occur due to

- Falling birth rate
- Lower fertility rate-As fertility declines, the share of the young population falls and if this decline is rapid, the increase in the population of working ages is substantial, yielding the 'demographic dividend'.
- Increased longevity

Falling birth rate and lower fertility rate will contribute to a reduction in expenditure; increased longevity will lead to an increase in the size of the working-age population.
Background for the development of basic structure doctrine

- Since the adoption of Indian Constitution, debates have started regarding the power of the Parliament to amend key provisions of the Constitution.
- In the early years of Independence, the Supreme Court conceded absolute power to Parliament in amending the Constitution, as was seen in the verdicts in Shankari Prasad case (1951) and Sajjan Singh case (1965). • In both the cases the court had ruled that the term "law" in Article 13 must be taken to mean rules or regulations made in exercise of ordinary legislative power and not amendments to the Constitution made in exercise of constituent power under Article 368. • This means Parliament had the power to amend any part of the constitution including Fundamental rights. • Article 13(2) reads, "The State shall not make any law which takes away or abridges the right conferred by this Part (PartIII) and any law made in contravention of this clause shall, to the extent of contravention, be void." • However, in the Golaknath case (1967), the Supreme Court held that Parliament could not amend Fundamental Rights, and this power would be only with a Constituent Assembly. • The Court held that an amendment under Article 368 is "law" within the meaning of Article 13 of the Constitution and therefore, if an amendment "takes away or abridges" a Fundamental Right conferred by Part III, it is void. • To get over the judgments of the Supreme Court in the Golaknath case (1967), RC Cooper case (1970), and MadhavraoScindia case (1970), the then government headed by Prime Minister Indira Gandhi had enacted

major amendments to the Constitution (the 24th, 25th, 26th and 29th). • All the four amendments brought by the government were challenged in the Kesavananda Bharati case.

A **13-judge Bench was set up by the Supreme Court, the biggest so far,** and the case was heard over 68 working days spread over six months.

- The case was **primarily about the extent of Parliament's power to amend the Constitution**.
- First, the court was **reviewing a 1967 decision in Golaknath v State of Punjab** which, had ruled that Parliament cannot amend fundamental rights.
- Second, the court was **deciding the constitutional validity of several other amendments**.
- The **executive vs judiciary manoeuvres displayed in the amendments ended with the KesavanandaBharati case**, in which the court had to settle these issues conclusively.
- In its majority ruling, the court held that fundamental rights cannot be taken away by amending them. While the court said that **Parliament had vast powers to amend the Constitution, it drew the line by observing that certain parts are so inherent and intrinsic to the Constitution that even Parliament cannot touch it.**
- The **origins of the basic structure doctrine are found in the German Constitution** which, after the Nazi regime, was amended to protect some basic laws. The original Weimar Constitution, which gave Parliament to amend the Constitution with a two-thirds majority, was in fact used by Hitler to his advantage to made radical changes. Learning from that experience, the new German Constitution introduced substantive limits on Parliament's powers to amend certain parts of the Constitution which it considered 'basic law'.
- In India, the **basic structure doctrine has formed the bedrock of judicial review of all laws passed by Parliament.**
- The present position is that the **Parliament under Article 368 can amend any part of the Constitution including the Fundamental Rights but without affecting the basic structure** of the Constitution.
- However, the **Supreme Court is yet to define or clarify as to what constitutes the basic structure of the Constitution**. From the various judgments, the following have emerged as basic features of the Constitution or elements / components / ingredients of the 'basic structure' of the constitution:
  - Supremacy of the Constitution
  - Sovereign, democratic and republican nature of the Indian polity
  - Secular character of the Constitution
  - Separation of powers between the legislature, the executive and the judiciary
  - Federal character of the Constitution
  - Unity and integrity of the nation
  - Welfare state (socio-economic justice)
  - Judicial review
  - Freedom and dignity of the individual
  - Parliamentary system
  - Rule of law
  - Harmony and balance between Fundamental Rights and Directive Principles
  - Principle of equality
  - Free and fair elections
  - Independence of Judiciary
  - Limited power of Parliament to amend the Constitution
  - Effective access to justice
  - Principle of reasonableness
  - Powers of the Supreme Court under Articles 32, 136, 141 and 142

**17. Zero Shadow Day**

**Context:** On April 25, **Bengaluru experienced a 'Zero Shadow Day'**, when vertical objects appear to cast no shadow.
**What is Zero Shadow Day?**

- 'Zero Shadow Day' is an **astronomical event** that **occurs twice a year** on specific dates in some parts of the world.
- It is a phenomenon that occurs **when the Sun is directly overhead and the shadows of vertical objects such as poles, trees, and buildings disappear completely** for a brief period of time.

**Why does a Zero Shadow Day happen?**

- **Uttarayan** (**movement of the Sun from south to north** from winter solstice to summer solstice) and **Dakshinayan** (**back from north to south**) happen because Earth's rotation **axis is tilted at an angle of roughly 23.5° to the axis** of revolution around the Sun.
- Ramanujam explained that the Sun's location moves from 23.5°N to 23.5°S of Earth's equator and back. All places whose **latitude equals the angle between the Sun's location and the equator on that day experience zero shadow day**, with the shadow beneath an object at local noon.

**When does a Zero Shadow Day happen?**

- The **dates of Zero Shadow Day vary from place to place**, and the event is more likely to occur near the equator. This **phenomenon lasts for a small part of a second**, but the effect can be seen for a minute to a minute-and-a-half.

## 18. Census of water bodies

**Concept :**

- Union Ministry of Jal Shakti released the report of its first-ever census of water bodies.

**Key Details:**

- **First-ever census of water bodies** released has thrown light on the number of water bodies in India and what they are used for.
- The census provides an extensive inventory of water sources in India, highlighting disparities between rural and urban areas and varying levels of encroachment.
- The census has identified 24,24,540 water bodies in India.

**About Water body census :**

- The **census of waterbodies was conducted in conjunction with the 6th Minor Irrigation Census for 2017-18.**
- It defines a waterbody as "**all-natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes."**
- The census aimed to provide an **inventory of India's water resources, including natural and man-made water bodies** like ponds, tanks, lakes, and more, and to collect data on the encroachment of water bodies.

**Key Insights from the Census:**

- The census enumerated a total of 24,24,540 water bodies across the country, with **West Bengal accounting for the most (7.47 lakh) and Sikkim the least (134).**
- **The report reveals that**:
- West Bengal has the highest number of ponds and reservoirs
- The top district in terms of waterbodies is South 24 Parganas in West Bengal.
- Andhra Pradesh has the highest number of tanks
- Tamil Nadu has the highest number of lakes
- Maharashtra leads in water conservation schemes
- The report highlights that 97.1% of the waterbodies are in rural areas, with only 2.9% in urban areas.
- **Most of the waterbodies are ponds, followed by tanks**, reservoirs, water conservation schemes, percolation tanks, check dams, lakes, and others.

**Encroachment of Waterbodies:**

- The **census also collected data on the encroachment of waterbodies for the first time**, revealing that 1.6% of all enumerated waterbodies are encroached, with 95.4% of encroachments in rural areas and the remaining 4.6% in urban areas.
- A significant percentage of encroachments cover more than 75% of the waterbody's area.

## WATERBODY COUNT

### STATES WITH MOST WATERBODIES

| State | No. of water bodies |
|---|---|
| West Bengal | 7,47,480 |
| Uttar Pradesh | 2,45,087 |
| Andhra Pradesh | 1,90,777 |
| Odisha | 1,81,837 |
| Assam | 1,72,492 |
| Jharkhand | 1,07,598 |
| Tamil Nadu | 1,06,957 |

### STATES/UTs WITH LEAST WATERBODIES

| State | Count |
|---|---|
| Sikkim | 134 |
| Chandigarh | 188 |
| Delhi | 893 |
| Arunachal Pradesh | 993 |

### WATERBODIES LOST TO ENCROACHMENTS

| State | Count |
|---|---|
| Uttar Pradesh | 15,301 |
| Tamil Nadu | 8,366 |
| Andhra Pradesh | 3,920 |

*No encroachment on waterbodies was reported from West Bengal, Sikkim, Arunachal Pradesh and Chandigarh*

## 19. Acute Mountain Sickness

**Concept:**

- Anurag is the second Indian to be rescued from Mount Annapurna this week after Baljeet Kaur.

**Acute Mountain Sickness**

- Acute mountain sickness can occur when a person who is used to being at a low altitude ascends to a higher altitude.
- It is the **most common type of high-altitude illness** and occurs in more than one-fourth of people traveling to above 3500 m (11 667 ft) and more than one-half of people traveling to above 6000 m (20 000 ft).
- Symptoms include headache, fatigue, poor appetite, nausea or vomiting, light-headedness, and sleep disturbances.
- In less than 1% of cases, symptoms can progress to **high-altitude cerebral edema**, a life-threatening condition marked by symptoms of wobbly gait, confusion, and decreased consciousness.

**Mt. Annapurna**

- Mount Annapurna is **situated in the Annapurna Mountain range of Gandaki Province, north-central Nepal.**
- It is the **tenth highest mountain in the world at 8,091 meters above sea level.**
- The entire massif and surrounding area are protected within the 7,629-square-kilometre Annapurna Conservation Area.
- It is also known as the **Killer Mountain due to its fatality to summit rate.**

**For further notes on Mountain peaks, refer – https://optimizeias.com/our-worst-nightmares-have-come-true-kin-of-mountaineer-missing-in-nepal/**

# GOVERNANCE

## 1. Indian history congress denounces changes made in NCERT books

**Concept :**

- **The Indian History Congress has said that it is** "greatly alarmed by the changes in the history syllabi and textbooks" recently effected by the National Council for Educational Research and Training (NCERT), and urged historians to stand up against "distortions of history".

**Distortions**

- It pointed out that the University Grants Commission (UGC), in the draft syllabus that it has framed for the Bachelor's course for History, **claims for India the "honour" of being the Aryan homeland, deems the epics as possible historical chronicles and excludes all reference to caste system in its ancient India portion.**
- **Mughal emperor Akbar, along with his policy of religious tolerance** between various religions, has been **excluded from the syllabus.**
- **In NCERT books**
- It claimed that the same process of "misrepresentation has been introduced in the prescribed History textbooks by omitting whole sections, along with individual passages and sentences.
- These include **complete omission of the narrative of the Mughal dynasty** which gave India political unity, and sundry other deletions **inlcduing Mahatma Gandhi's assasination.**

**About Indian History Congress:**

- Indian History Congress(IHC) was **founded in 1935**
- IHC is the largest **association of professional historians in South Asia.**
- It has about **35000 members of which over 2000 delegates participate** in its **session every year.**
- It has been holding its sessions very regularly from its inception and publishing its proceedings every year since 1935.
- **Origin:**
- IHC can be traced to the efforts of scholars working on India's ancient past as well as modern history, in a bid to counter the colonial claims, while also drawing from Western analytical methods.
- **Bharata ItihasaSamshodhaka Mandala (BISM**) was one such effort that owed its origins to the stalwart **Vishwanath Kashinath Rajwade**. He founded this institution in 1910 in Pune with the support of K C Mehendale.
- **BISM organised an All India Congress in 1935** to celebrate its silver jubilee. The Indian History Congress (IHC) was thus born with about 50 delegates.
- **Mandate:**
    - To regulate the standard of works of history produced in India.
    - To promote impartial and substantive history.
    - To commit to a fair and scientific history, devoid of bias and politics.
    - Historians Ram Sharan Sharma, Satish Chandra, Bipan Chandra, Romila Thapar, B. N. Mukherjee, N. Panikkar, BrajadulalChattopadhayay, Dwijendra Narayan Jha, Sumit Sarkar, Sabyasachi Bhattacharya have had a long association with the Indian History Congress.

## 2. Government likely to ask addicts to submit for rehabilitation to avoid jail time

**Concept :**

- As the Union government debates decriminalising consumption of narcotic drugs and psychotropic substances, it is **likely to bring in a policy where addicts and users will have to submit themselves before treatment centres and declare themselves as such in order to escape criminal prosecution.**
- Currently, under the **Narcotic Drugs and Psychotropic Substances Act, 1985**, the **consumption** of any narcotic drugs or psychotropic substance **may attract a jail term of up to one year and/or fines up to ₹20,000.**
- As of now, while enforcement agencies are targeting supply chains, the Social Justice Ministry is concurrently running countrywide awareness and rehabilitation campaigns to treat users and addicts like victims and not criminals.

**Narcotic Drugs and Psychotropic Substances Act, 1985**

- The Narcotic Drugs and Psychotropic Substances Act is an Act of the Parliament of India that **prohibits a person to produce/manufacture/cultivate, possess, sell, purchase, transport, store, and/or consume any narcotic drug or psychotropic substance.**
- As per the NDPS Act, narcotic drugs include coca leaf, cannabis (hemp), opium and poppy straw.
- Psychotropic substance means **any natural or synthetic material or any salt or preparation covered under the 1971 convention on Psychotropic substances.**
- The **following conventions** various forms of control to limit the use of narcotic drugs and psychotropic substances
- The UN Single Convention on Narcotics Drugs 1961
- The Convention on Psychotropic Substances, 1971

- The Convention on Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988
- India is a **signatory to all these three**.
- NDPS Act has made stringent provisions for the control and regulation of operations relating to narcotic drugs and psychotropic substances.
- As per the NDPS Act, the **minimum sentence for dealing with drugs is 10 years rigorous imprisonment coupled with a fine of Rs. 1 lakh.**
- **No bail is granted for those persons booked under this act.**
- In addition, no relief can be obtained by the drug convicts through suspension, remission and commutation of sentences passed.
- NDPS Act prescribes even though the offence cannot be called as a heinous crime.

## Other Important Sections :

- **Section 8(c) of the Act** – The section has wide provisions for producing, manufacturing, possessing, selling, purchasing, transporting, using, consuming, importing, and exporting any narcotic drug or psychotropic substance.
- **Section 20 (b)** relates to **use of cannabis.**
- **Section 27** relates to **consumption of any narcotic drug** or psychotropic substance.
- Section 27 which is a charge for consumption has a maximum charge of one year.
- **Section 35** which is a **presumption of culpable mental state**. This means that it is upon the accused to show that he did not have an intention, motive, knowledge to commit the offences he is charged with.

## Narcotics Control Bureau

- It was constituted by the Government of India in1986 **under the Narcotic Drugs and Psychotropic Substances Act, 1985.**
- It is the **apex coordinating agency under the Ministry of Home Affairs.**
- The **National Policy on Narcotic Drugs and Psychotropic Substance**s is based on Article 47 of the Indian Constitution which directs the State to endeavour to bring about prohibition of the consumption, except for medicinal purposes, of intoxicating drugs injurious to health.
- **Drug abuse control is the responsibility of the central government.**

## 3. Govt. introduces Aquaculture Bill amid din in Lok Sabha

### Concept :

- The government introduced the **Coastal Aquaculture Authority (Amendment) Bill, 2023 amidst the disruption of the Lok Sabha** by the opposition over demands for a Joint Parliamentary Committee probe into the Adani issue.
- The Coastal Aquaculture Authority (Amendment) Bill was introduced by the Minister of Fisheries, Animal Husbandry and Dairying.
- The Bill aims to **decriminalize certain offences listed under the 2005 Act in order to promote ease of doing business.**
- The Bill also seeks to **fine-tune existing operational procedures of the Coastal Aquaculture Authority** and **promote newer forms of environment-friendly coastal aquaculture** as these new forms have the potential to create additional job opportunities.
- Further, the Bill also has **provisions that restrict the use of antibiotics and pharmacologically active substances** which are harmful to human health in coastal aquaculture.

## Coastal Aquaculture Authority:

- The **Coastal Aquaculture Authority (CAA)** was established under **the provisions of the Coastal Aquaculture Authority Act, 2005** for regulating the activities connected with coastal aquaculture in coastal areas.
- It takes **measures for regulation of coastal aquaculture** by prescribing guidelines to ensure that coastal aquaculture does not cause any detriment to the coastal environment and the concept of responsible coastal aquaculture contained in the guidelines shall be followed in regulating coastal aquaculture activities to protect the livelihood of various sections of people living in the coastal areas.

## Aquaculture

- Aquaculture essentially means, **breeding, raising, and harvesting fish, shellfish, and aquatic plants.**
- In a nutshell, it's **farming in water.**
- Saline water along the coast has been found to be suitable for practising aquaculture which produces shrimp, majorly.
- If aquaculture is not practised on this land, it will be left idle and uncultivated as it is not suitable for the cultivation of crops.
- Aquaculture can be practised on about 12 lakh hectares in the country along the coast, of which only 14% has been utilized so far.

It can be classified into following categories

- **Freshwater aquaculture**
- **Coastal aquaculture**
- Sea farming
- Brackish water aquaculture

## 4. Nicobar project violates tribal rights : ST panel

**Concept :**

- The **NCST has cited alleged violations under the Forest Rights Act (FRA), 2006** with respect to the forest clearance granted for the Great Nicobar Island (GNI) Project.
- The FRA provides for the recognition of wider community rights over forest land.
- The legislation allows forest communities the right to control and manage the use of the forest land over which they hold titles and their consent is mandatory for diverting it.

**Violations under the Forest Rights Act (FRA), 2006**

- According to **Rule of Forest Conservation Rules-2017 (FCR)**, **any diversion of forest land would first require the District Collector to recognise and vest rights to locals under the FRA.**
- **Only then do the rules permit authorities to seek consent of the now-rights-holding gram panchayats** for the diversion of this land.
- These **provisions were envisioned to give primacy to rights of indigenous forest-dwelling communities.**
- However, the **district administration did not receive or process a single claim** over forest land under the FRA.
- Instead, **a special Gram Sabha meeting was called and a resolution was purportedly passed.**
- The resolution consented to diversion of the forest land adjacent to their villages for the purpose of the project.

**NCST had also opposed the Forest (Conservation) Rules (FCR) 2022**

- FCR 2022 make a **provision for private parties to cultivate plantations and sell them as land to companies** who need to meet compensatory forestation targets.
- The rules allow **private developers to clear forests without first seeking the permission of the forest dwellers.**
- NCST opposed the FCR-2022, which had done away with the consent clause altogether.

**Nil implementation of FRA**

- The Andaman and Nicobar administration had **reported nil implementation of FRA.**
- The justification of the administration has been that the islands have the **Andaman and Nicobar Islands (Protection of Aboriginal Tribes) Act, 1956 (PAT56).**
- This act already provides for the full protection of the interests of forest-dwelling Scheduled Tribes.
- So, there is no claim as such for settlement under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- NCST claimed that, **under the PAT56, a significant portion of the forest land in Great Nicobar has been marked as a Tribal Reserve.**
- Over these reserves, **local tribespeople have been given rights to use and collect resources as and when needed for their daily sustenance.**
- However, the **power of notification and de-notification of the land as a Tribal Reserve is solely with the administrator of the islands under PAT56.**

**For further notes on the GNI Project, refer** – https://optimizeias.com/great-nicobar-project-2/
**For further notes on the NCST, refer – https://optimizeias.com/ncst-functioning-with-less-than-50-of-sanctioned-strength-ministry-in-ls/**

# HISTORY

## 1. Famed US museum to repatriate stolen artefacts

**Concept :**

- The Metropolitan Museum of Art, New York, is returning 15 antiquities to the Government of India after having learned that these were "illegally removed" from India.

**Art works returned**

- The sculptures **date back from the 1st century BCE to the 11th century CE**, and include terracotta, copper, and stone works.
- Among the antiquities is an enthralling **sandstone sculpture of Apsara,** the celestial dancer.
- The 33.5inch tall sculpture **from Madhya Pradesh dates back to the mid11th century** CE and is worth $10,00,000 (around ₹ 82crore).
- A 1st century BCE ceramic pot from Chandraketugarh (archaeological site near Kolkata), a **stone bust of Kamadeva**, the God of Love, from the second half of the 8th century CE, and a **Svetambara enthroned Jina**, with attendant Yaksha and Yakshi, belonging to the 11th century CE, are also part of the antiquities.

**Apsara Sculpture**

- An apsara is a **heavenly dancer and celestial maiden who accompanies the gods in Hindu mythology.**
- Featuring prominently in sculpture, dance, literature and painting from India, Indonesia, China and Cambodia, apsaras are thought to personify the performing arts.
- This **sensual, sandstone figure came from the walls of a Hindu temple at Khajuraho in North India.**
- She stands **relaxedly in a tribhanga pose**, a gentle, curving S-shaped stance constituted by three bends in the body at the neck, waist and knee.
- This **posture is considered one of the most graceful and sensual of the positions in the Odissi, a major Indian classical dance** that originated in the Hindu temples of Odisha, an eastern coastal state of India.
- Her lyrical curves evoke the lilting rhythm of music and dance.
- Kama (desire, longing or enjoyable experience) is a central tenet of Hinduism and is considered an integral part of spirit and creation.



## 2. Pattanam Mystery

**Concept :**

- Pattanam is a village in central Kerala. It is said to be the only multicultural archaeological site on the southwestern coast of the Indian subcontinent.
- Pattanam is a part of Muziris which is called the 'first emporium' of the Indian Ocean.
- The Greco-Roman classical age came into direct contact with an ancient South Indian civilization in Muziris.
- The excavations in Pattanam **highlight that there was no caste or institutionalized creed and use of weapons.** Moreover, it was a **thriving urban centre with a secular society.** However, much of the region remains to be excavated.

**Excavations in Pattanam**

- The excavations in the region have unearthed less than 1% of the site.

- More than 45 lakh sherds (or ceramic fragments) have been unearthed from the region. These comprise around 1.4 lakh items belonging to regions of the Mediterranean, the River Nile, the Red Sea, the eastern and western Indian Oceans, and the South China Sea.
- The **seal of a sphinx** was also found, which **belongs to the ancient Greek city of Thebes.**
- Based on technological, metallurgical, literary, and artistic advances, it is found that there were rigorous cultural and commercial exchanges in Pattanam.
- It is thus inferred that **Pattanam was a thriving urban centre that existed from the 5th century B.C. till the 5th century A.D**. Moreover, a **peak phase was experienced from 100 B.C. to A.D. 300.**
- Notably, there is **no evidence of the existence of institutionalized religion in ancient Pattanam. Moreover, there are no findings of the graded inequality of the caste system that has described contemporary Kerala and most of India.**
- It should be **noted that Pattanam lacks sophisticated weaponry**. This is in stark contrast to other contemporary sites like Berenike in Egypt and Khor Rori in Oman.
- The fragmentary skeleton remains at graves highlight the "secondary" nature of burial. The dead were first cremated and then osseous remains were ceremoniously buried.
- Furthermore, **people of different backgrounds were buried in the same way**. Thus, suggesting the prevalence of a **secular ethos.**
- The genotype and ancestry analyses of samples show the link to South Asian, West Asian, and Mediterranean lineages.
- **No artefact indicates any religious customs.**
- Material evidence highlights that the society lived in harmony with nature, much like the several indigenous societies.
- However, much of the site remains to be unearthed.

## 3. Thirra Dance Form

**Concept :**

- Recently, 'Nagaraja Thira' was celebrated at the SreeMuchilottu temple at Kuthiravattom in Kozhikode.

**Thirra Dance**

- Thirra or Theyyamthira is a **ritual dance performed in "Kaavu"(grove)& temples of the Malabar region in Kerala State, South India**.
- This art form is performed by the **artists of malaya** (the artist who recognised for performing the art form called as a "perumalayan") **community**. This art is performed during Utsavam (annual temple festival). Clan deities such as Bhagavathi, Shiva are worshipped in these forms.
- **Theyyamthira is main sub division of Theyyam**. It is similar to the Theyyam dance performed in the same region, except that in Theyyam the performer is considered as the god he is representing, while in Thira the performer is considered as to be possessed by god.
- Thira brings the gods to life. Performers dress up with ceremonial facial paint and loud clothing and dance in front of the deity, the bhagavathi. The objective clearly is to bring a sense of awe to the proceedings. Each performer represents a particular deity and is sponsored by devotees as a prayer offering. These dancers are viewed as being possessed by the gods when they are in their act, with devotees queuing up to meet them to share woes and wishes.
- The performers belong to the "Peruvannan" caste of, who are given prime importance in Thira. Therefore in Kerala, both upper caste Brahmins, and lower caste tribals have an important place in worship.

## 4. Kalakshetra teacher booked for harassment, its director gets panel summons

**Context:** Kalakshetra teacher booked for harassment, its director gets panel summons
**Concept:**

- Kalakshetra Foundation is an arts and cultural academy dedicated to the preservation of traditional values in Indian art and crafts, especially in the field of Bharatanatyam dance and Gandharvaveda music.
- It is based in Chennai.
- It was founded in 1936 by Rukmini Devi Arundale and her husband George Arundale.
- In 1994, an Act of the Parliament of India recognised the Kalakshetra Foundation as an "Institute of National Importance."
- The Kalakshetra style of Bharatanatyam developed by Rukmini Devi Arundale is noted for its angular, straight, ballet-like kinesthetics, and its avoidance of Recakas and of the uninhibited throw (Ksepa) of the limbs.

## 5. Mughal Chronicles

**Context: NCERT removes chapter on Mughals**

- The chronicles commissioned by the **Mughal emperors** are an important source for studying the **empire and its court**.
- They were written in order to project a **vision of an enlightened kingdom** to all those who came under its umbrella.

- At the same time, they were meant to **convey to those who resisted the rule of the Mughals** that all resistance was destined to fail.
- Also, the rulers wanted to ensure that there was an account of their rule for posterity.
- The authors of Mughal chronicles were invariably courtiers. The histories they wrote focused on events centered on the ruler, his family, the court and nobles, wars and administrative arrangements.
- Their titles, such as the **Akbar Nama, Shahjahan Nama, Alamgir Nama, that is, the story of Akbar, Shah Jahan and Alamgir (a title of the Mughal ruler Aurangzeb),** suggest that in the eyes of their authors the history of the empire and the court was synonymous with that of the emperor
- Mughal court chronicles were written in Under the Sultans of Delhi, it flourished as a language of the court and of literary writings, alongside north Indian languages, especially Hindaviand its regional variants.
- As the Mughals were Chaghtai Turks by origin, Turkish was their mother tongue. Their first ruler Babur wrote poetry and his memoirs in this language. It was Akbar who consciously set out to make Persian the leading language of the Mughal court. Cultural and intellectual contacts with Iran, as well as a regular stream of Iranian and Central Asian migrants seeking positions at the Mughal court, might have motivated the emperor to adopt the language.
- Persian was elevated to a language of empire, conferring power and prestige on those who had a command of it. It was spoken by the king, the royal household and the elite at court. Further, it became the language of administration at all levels so that accountants, clerks and other functionaries also learnt it.
- Even when Persian was not directly used, its vocabulary and idiom heavily influenced the language of official records in Rajasthani and Marathi and even Tamil. Since the people using Persian in the sixteenth and seventeenth centuries came from many different regions of the subcontinent and spoke other Indian languages, Persian too became Indianized by absorbing local idioms.
- A new language, Urdu, sprang from the interaction of Persian with Hindavi. Mughal chronicles such as the Akbar Nama were written in Persian, others, like Babur's memoirs, were translated from the Turkish into the Persian Babur Nama. Translations of Sanskrit texts such as the Mahabharata and the Ramayana into Persian were commissioned by the Mughal emperors. The Mahabharata was translated as the Razmnama (Book of Wars)

## 6. Teja Singh Sutantar

**Concept :**

- Punjab Chief Minister unveiled a statue of Teja Singh Sutantar, a former MP and revolutionary leader.

**Teja Singh Sutantar**

- Teja Singh was born as Samund Singh in 1901 in Aluna village of Gurdaspur district.
- After completing his schooling, he **joined Khalsa College in Amritsar.**
- **Following the Jallianwala Bagh massacre in 1919, he joined the Akali Dal** to participate in the movement to liberate gurdwaras from degenerate mahants.
- However, in **September 1921, he formed his own squad called the SutantarJatha**, which **successfully liberated a gurdwara in a village called Teja i**n Gurdaspur district from the mahants.
- He later freed another gurdwara in Othian village from mahants.

**Early life and revolutionary activities**

- In early 1923, **Teja Singh went to Kabul as a Sikh missionary and there he came into contact with a few leaders of the Ghadar Party**, who were preparing for their second attempt to overthrow the British government.
- They persuaded Teja Singh to undergo military training, so **he joined the Turkish military academy in 1925** under the pseudonym Azad Beg.
- He **later moved to Berlin and then to Canada and the United States**, where he addressed congregations of Indians, mainly Punjabi Sikh immigrants.

**Political Career**

- After visiting several countries**, Teja Singh returned to India and became a prominent leader of the communist party (CPI).**
- He contributed **revolutionary articles to the party journal, the Kirti, frequently writing about issues that plagued peasants.**
- In May 1937, he was elected unopposed to the Punjab Legislative Assembly as a nominee of the Indian National Congress while he was still in prison.
- He continued to remain a member of the Punjab Legislative Assembly till 1945.
- He was also the **secretary of the Communist Party (Punjab) from 1944 to 1947**.

**Post Independence political activities**:

- Post-independence, **Teja Singh, who a prominent leader of the Kisan Sabha**, led a number of peasant agitations against the government and landlords.
- He was a **key leader in the PEPSU Muzara movement**, which **started in the 1930s and went on till 1952.**

- The **movement was started by landless peasants (muzaras) in PEPSU (Patiala and East Punjab States Union**, which included the districts of Mansa, Sangrur, Barnala, and parts of Bathinda, apart from Patiala) **to obtain ownership rights of the land** they had been tilling for generations.
- The farmers would finally receive land rights in 1952.
- After independence, **Teja Singh formed his Lal (Red) Party with the Kirti group of the Punjab Communist Party** as its nucleus.
- He would go on to become a member of the Punjab Legislative Council from 1964-1969.
- He **edited Lal Jhanda**, a **monthly magazine in Urdu**, **Lal Savera, a Punjabi weekly** and contributed to various newspapers.
- In 1971, he was **elected to the Lok Sabha**.

## 7. Uttaramerur inscription

**Concept :**

- Greeting Tamilians on the occasion of Puthandu, the Tamil New Year, Prime Minister of India mentions an **over 1,100 year old inscription from Tamil Nadu.**

**About the inscription:**

- The **Uttaramerur inscription** is **dated around 920 A.D. in** the **reign of ParantakaChola.**
- It testifies to the historical fact that nearly **1,100 years ago, a village had an elaborate and highly refined electoral syste**m and **even a written constitution** prescribing the **mode of elections.**
- The details of this system of **elective village democracy** are inscribed on the walls of the village assembly (gramasabha mandapa).

**What is inscribed?**

- On the walls of the mandapa a **variety of secular transactions of the village**, dealing with **administrative, judicial, commercial, agricultural, transportation and irrigation regulations** are inscribed.
- The villagers even had the **right to recall the elected representatives** if they failed in their duty.

**About the Uttaramerur village:**

- Uttaramerur is situated in **Kancheepuram district** in Tamil Nadu.
- The **Pallava king Nandivarman II established it around 750 A.D.**
- The **Pallavas, the Cholas, the Pandyas, the Sambuvarayars, the VijayanagaraRayas, and the Nayaks** successively ruled it.
- The village has **three important temples**,
- the **SundaraVaradarajaPerumal temple,**
- the **Subramanya temple, and**
- the **Kailasanatha temple.**
- The three temples have a **large number of inscriptions**, notably those from the reigns of **Raja RajaChola (985-1014 A.D.), his son Rajendra Chola, and the Vijayanagar emperor Krishnadeva Raya.**
- **Rajendra Chola** as well as **Krishnadeva Raya visited Uttaramerur.**
- Uttaramerur, built on the canons of the agama texts, has the village assembly mandapa at the centre.
- All the temples are oriented with reference to the mandapa.
- At Uttaramerur on the walls of the village assembly (mandapa) itself that we have the earliest inscriptions with complete information about how the elected village assembly functioned.

**The practice**

- The **entire village, including infants, had to be present at the village assembly** mandapa at Uttaramerur when elections were held.
- **Only the sick** and **those who had gone** on **a pilgrimage were exempt.**
- There were **committees for the maintenance** of irrigation tanks, roads, to provide relief during drought, to test gold, and so forth.
- The village **assembly drafted the constitution** for the elections.

**The salient features were as follows:**

- **village was divided into 30 wards**, one representative elected for each.
- **Specific qualifications** were prescribed for those who **wanted to contest**.
- The essential criteria were age limit, possession of immovable property, and minimum educational qualification.
- Those who wanted to be elected should be **above 35 years of age and below 70**.
- **Only those who owned land that attracted tax** could contest elections.
- A **person serving in any of the committees could not contest again** for the next three terms, each term lasting a year.

- Elected members who accepted bribes, misappropriated others' property, committed incest, or acted against the public interest suffered disqualification.

## 8. Ambedkar Jayanti

**Concept**:

- **Bhirao Ramji Ambedkar**, popularly known as Babasaheb, was the chairman of Constitution Drafting Committee and a champion of Dalit and minority rights movement in India.
- Ambedkar, who was an economist and social reformer, also served as **the first Law Minister of Independent India.**
- Born into a poor Mahar caste in Mhow, Madhya Pradesh, he was the first untouchable to have entered **Elphinstone College** which was affiliated with University of Bombay.
- After obtaining a degree in economics and political science, Ambedkar moved to United States in 1913 to study at **Columbia University** in New York City. He earned doctorates in economics from Columbia University **and London School of Economics.**
- Throughout his political career and public life, Ambedkar worked for upliftment of **Dalit (untouchable) community.**
- In 1920, Ambedkar launched a newspaper called "**Mooknayaka**"
- Other periodicals started by him were – '**Bahishkrit Bharat' (1927), 'Samatha' (1929)** and **'Janata' (1930))**
- In 1923, he set up the '**BahishkritHitkarini Sabha**.
- Ambedkar launched full-fledged movements for **Dalit rights in 1927** and demanded public drinking water sources open to all and right for all castes to enter temples. This is called as **Mahad Satyagraha.**
- Ambedkar participated in **all three round table conferences** in London.
- He demanded separate electorate for untouchables which were opposed by Gandhiji leading to **Poona pact in 1932.**
- The **Poona Pact** was an agreement between Mahatma Gandhi and B. R. Ambedkar on behalf of depressed classes and upper caste Hindu leaders on the reservation of electoral seats for the depressed classes in the legislature of British India in 1932.
- It was signed by Ambedkar on behalf of the depressed classes and by Madan Mohan Malviya on behalf of Hindus and Gandhi as a means to end the fast that Gandhi was undertaking in jail as a protest against the decision made by British prime minister **Ramsay MacDonald** to give **separate electorates** to **depressed classes** for the election of members of provincial legislative assemblies in British India. They finally agreed upon 148 electoral seats. Nearly twice as many seats were reserved for **Depressed Classes** under the **Poona Pact** than what had been offered **by MacDonald's Separate Electorate**.
- He published the book **Annihilation of Caste in 1936** which spoke against caste system and Hindu orthodox religious leaders.
- In order to participate in this election Dr. Ambedkar established **Independent Labour Party** in August, 1936 which contested election on 17 seats in Bombay Presidency and won 15 seats.
- After this on 19th July, 1942 he formed another party known as **All India Scheduled Castes Federation (AISCF)**. This party contested election held in 1946 and 1952 but lost them under the adverse impact of Poona Pact.
- As a result of it Dr. Ambedkar himself lost the election in 1952 and 1954
- At last Dr. Ambedkar dissolved AISCF on 14th October, 1956 at Nagpur and announced the formation of **Republican Party of India (RPI)**.
- He was the **chairman** of the **drafting committee** of **Indian constitution**

## 9. Jamia masjid in J&k

**Concept :**

- All Parties Hurriyat Conference of Friday said that disallowing prayers at Srinagar's grand mosque as well as the continued incarceration of its chairman Mirwaiz Umar Farooq defies the government's claims that "all is well now" in "Naya Kashmir".

### Jama Masjid

- Jamia Masjid is a mosque in Srinagar, Jammu and Kashmir, India. It is situated at Nowhatta in the middle of the Old City.
- The Mosque was commissioned **by Sultan Sikandar in 1394 CE and completed in 1402 CE**, at the **behest of Mir Mohammad Hamadani**, son of Mir Sayyid Ali Hamadani, and is regarded as one of the most important mosques in Kashmir.
- The Mosque is located in Downtown which remains a central zone to the religio-political life in Srinagar. Thronged by Muslims every Friday, it is one of the prime tourist attractions of Srinagar.
- The Jamia Masjid is **heavily influenced by Persian architecture**, **with similarities to the Buddhist pagodas.**

## 10. Repatriation of ancient remains has to be a Naga process

**Concept :**

- Speaking of repatriating ancestral human remains, taken away as trophies of colonialism, it took the Maoris 12 years.
- In the case of other aboriginal peoples, it has taken decades.
- For the Naga people, the journey is only beginning, in the shape of a project to repatriate Naga ancestral human remains from the **Pitt Rivers Museum, Oxford University.**

## RRaD (Recover, Restore and Decolonise)

- RRaD (Recover, Restore and Decolonise) was formed **in 2021 to facilitate and engage with issues around the repatriation of Naga ancestral human remains** to the Naga homeland.
- In 2020, the Pitt Rivers Museum (PRM) in Oxford, UK, reached out to the Forum for Naga Reconciliation (FNR) to help facilitate community dialogue regarding the "future care and return" of Naga ancestral human remains.
- As part of this process, the FNR formed Recover Restore and Decolonise (RRaD) to study and network with indigenous elders, conduct participatory action research, generate public awareness, and develop a strong viable case to make an official claim to the University of Oxford for returning the Naga human remains.

## 11. St Thomas's shrine

### Context:

- Kerala BJP Vice President AN Radhakrishnan trekked to a hilltop shrine in Malayattoor village of the Ernakulam district, on the occasion of a festival held there on the first Sunday after Easter.

### More about the Shrine.

- The shrine is dedicated to **Saint Thomas**, an **apostle** who was believed to be **one of the 12 followers of Jesus Christ.**
- It is said that **he arrived at the location of the shrine** after reaching **India in 52 AD.**
- Devotees believe **he performed a miracle and left a footprint** on the hilltop.

### Who was Saint Thomas:

- Thomas the Apostle also known as **Didymus**, was one of the **Twelve Apostles of Jesus according to the New Testament.**
- Thomas is commonly known as **"Doubting Thomas"** because he initially **doubted the resurrection of Jesus Christ.**

### What about his visit to India:

- According to **traditional accounts** of the **Saint Thomas Christians of modern-day Kerala** in India, Saint Thomas **traveled outside the Roman Empire to preach the Gospel**, travelling as far as the **Tamilakam which is in South India** and **reached Muziris of Tamilakam in AD 52.**
- He is regarded as the **patron saint of India among its Christian adherents**, and the **Feast of Saint Thomas on July 3** is celebrated as **Indian Christians' Day.**

### Why is St Thomas's visit disputed:

His visit is disputed partly because of a **lack of account about their** details, though his **tomb is mentioned** by travellers who came to India, such as the 13th Century merchant **Marco Polo.**

## 12. National Museum Institute

### Concept :

- National Museum Institute (NMI) is the content creator for the new parliament museum upgrade.

### About NMI :

- The National Museum Institute of the History of Art, Conservation and Museology was formed and **registered in 1989 under the Societies Registration Act, 1860.**
- It has been accorded the **status of 'Deemed to be University'**.
- It is under the **Ministry of Culture**.

### Mandate:

- The Institute is one of the leading centres in the country for training and research in the field of art and cultural heritage.
- It imparts higher education in Master of Arts and Ph. D in the field of History of Art, Conservation and Museology.

## 13. Reviving a 'dead' river: a cultural event to celebrate legacy of Yamuna

### Concept :

- **Indira Gandhi National Centre for the Arts (IGNCA)** will host a cultural programme on the banks of the river yamuna in Delhi, under its special project — Riverine Cultures of India — that began in 2018.
- The highlight of the event will be a short festival of films on waterbodies, shot by children from across the country.

- The programmes will include a photo exhibition comparing the Yamuna of today with what the river was like 50 years ago; symposia on various aspects such as ecology and conservation of India's rivers and their importance in the country's heritage; and an exhibition themed on 15 ghats across the country in Sanjhi or paper stencil art.
- The larger project is focusing on six rivers right now: Ganga, Yamuna, and Sindhu in the north; and Krishna, Godavari, and Cauvery in the south.
- The Yamuna's confluence with the Ganga and the mythical Saraswati at Triveni Sangam in Prayagraj is one of the country's most important pilgrimage spots for Hindus.
- **Yamuna – Dead River**
- The river had been declared "almost dead" by the Central Pollution Control Board (CPCB) in 2015 citing untreated waste flowing into it from several cities along its banks.
- The **definition of a river is that it must have life, which is measured by its capacity to dissolve oxygen**.
- The dissolved oxygen content in the Yamuna as it passes through Delhi is zero.

## About IGNCA

- The **Indira Gandhi National Centre for the Arts (IGNCA) was established in 1987** as an **autonomous institution under the Ministry of Culture**, as a centre for research, academic pursuit and dissemination in the field of the arts.
- The IGNCA has a trust (i.e. Board of Trustees), which meets regularly to give general direction about the Centre's work. The Executive Committee, drawn from among the Trustees, functions under a Chairman.
- It is a **research unit under Project Mausam.**
- **Project 'Mausam' is a Ministry of Culture project** with **Archaeological Survey of India (ASI), New Delhi as the nodal agency.**
- The central themes that hold **Project 'Mausam' together are those of cultural routes and maritime landscapes that not only linked different parts of the Indian Ocean littoral, but also connected the coastal centres to their hinterlands.**
- A project on design and development of a **Vedic Heritage Portal** was initiated at IGNCA, under the aegis of the Ministry of Culture, Government of India. The portal aims to communicate messages enshrined in the Vedas.

## 14. Ancient Sanskrit poetess Shilabhattarika

**Why in News?**
Copper plates decoded by **Pune-based Bhandarkar Institute** shed light on celebrated **ancient Sanskrit poetess Shilabhattarika**. A copperplate charter with **five copper plates** said to be dating from the reign of the **Badami Chalukyan ruler Vijayaditya (696-733 CE)** were brought for decipherment.
**The Charter**

- The copper plate charter dated from the time of Chalukyan ruler Vijayaditya.
- The charter had five plates measuring 23.4 cm by 9.4 cm, held together by a copper ring bearing a beautiful varaha (boar) seal.
- The varaha seal is the trademark of the Badami Chalukyas.
- The charter contained a Sanskrit text of a total of 65 lines inscribed in late-Brahmi script.

## Shilabhattarika

- Inscriptions on Pune copper plates establish the poetess as a Chalukyan Princess.
- Shilabhattarika is the daughter of the Chalukyan ruler Pulakeshin II of Badami (in modern Karnataka), who defeated Harsha.
- Pulakeshin II ruled from 610-642 CE. He defeated Harshavardhan of Kanauj in a battle near the banks of the Narmada River in 618 CE.
- This decipherment revealed Shilabhattarika, as a poetess in the ancient Indian world in the **heavily male-dominated field of classical Sanskrit literature**.
- The **Sanskrit poet-critic Rajashekhara** (who lived in the **9th-10th century CE**) and was the **court poet** of the **Gurjara-Pratiharas**, has praised Shilabhattarika for her elegant and beautiful compositions.

Noted **Marathi poetess, Shanta Shelke** drawn inspiration from Shilabhattarika's verse to compose one of her most iconic songs— *tochchandramanabhat* (translated as 'it is the same moon in the sky'). The decoding marks a notable shift in the historiography of Badami Chalukyas by **placing Shilabhattarika** as having lived in the **7th century CE** rather than the current theory which has her as a wife of the 8th century Rashtrakuta ruler, Dhruva.
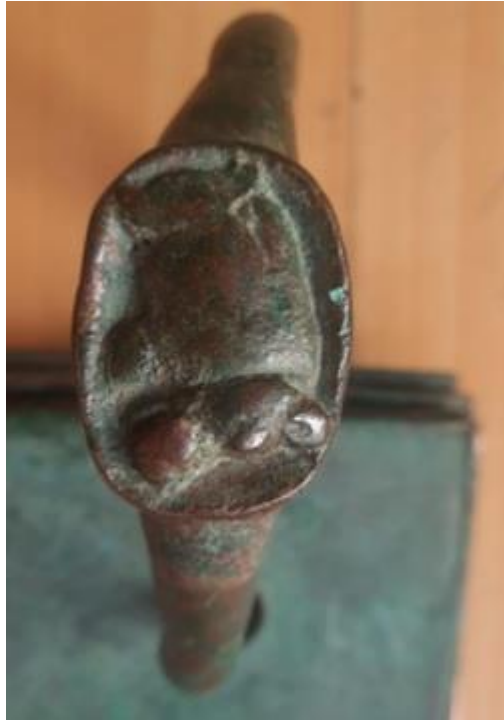
**King Vijayaditya Donating a Village**

- King Vijayaditya, a Chalukyan ruler ruled from **696 CE to 733 CE**. His reign was marked by **general peace and harmony**. He built a number of temples.
- A primary reading of the plates revealed that Vijayaditya had donated the village of **Sikkatteru in the KogaliVishaya** to a Vedic scholar named **Vishnusharma** in the month of *Magha*, *Shaka*year 638, corresponding to January-February 717 CE.
- Sikkatteru is identified as **Chigateri situated near Kogali in the Vijayanagar district** of Karnataka.
- The plates revealed that the village was donated **on request by Mahendravarma**, the son of Shilabhattarika, the daughter of '**Satyashraya**'.
- While other Badami Chalukyan rulers affixed the title of 'Satyashraya' (translated as "patron of truth") to their names, the **only ruler to be known purely by this title was Pulakeshin II**. Pulakeshin II was the great-grandfather of Vijayaditya.

**Other Facts Revealed from the Copper Plates**

- The names of **Shilabhattarika's father-in-law Mokkara** (or Mushkara), and his father **Durvinita** (the most important ruler of the **Western Ganga dynasty** who ruled from 529-579 CE) are also given in the plates.
- Shilabhattarika was married to **Dadiga**, a prince of the **Ganga lineage of Talakkad**. The most important ruler of the Western Ganga dynasty, Durvinita, was succeeded by Mokkara, who ruled till 604 CE. Dadiga was the son of Mokkara.
- Mokkara was succeeded by Polavira, his eldest son while his **younger son Dadiga** (Shilabhattarika's husband) was possibly **deputed to Kogali as its governor**.
- His son **Mahendravarma** continued in the same position.

**Badami Chalukyas, Ganga Dynasty and Pallavas**

The **Gangas** acted as **subordinates to the Chalukyas of Badami** and fought against the Pallavas of Kanchi. Hence Mahendravarma's age was estimated to be above 70 years old when these plates were issued. The **Pallavas** were the **sworn nemesis or arch-rivals** of the Badami Chalukyas, with **Pulakeshin II** being defeated (and possibly killed) in 642 CE in the invasion by the **PallavaNarasimhavarman I**.

**The importance of Shilabhattarika and her poetry**

- Over 40 of Shilabhattarika's verses are said to be still existing.
- **Rajashekhara, the great 9th-century critic lauds her compositional style**. According to him, Shilabhattarika's works adhere to the **Panchali style that calls for a balance of the word with its meaning**.
- In this regard, Rajashekhara even places her **at par with Banabhatta, the court poet of Harsha**.

**Literature Lineage of Shilabhattarika**

It was decoded how Shilabhattarika might have acquired such a high degree of proficiency in composing poetry, which placed her on an equal footing with the most exalted male poets of the age. **Badami Chalukyas** and the **Western Gangas** were great patrons of literature. Shilabhattarika's great-grandfather-in-law, **Durvinita** (noted ruler of the Western Gangas), was himself a **proficient composer**, and had **patronised Bharavi**, the author of a classical epic **Kiratarjuniya**. Shilabhattarika was born in Badami

Chalukya family and got married in Western Gangas family. With an illustrious literary pedigree on both sides of her family, it is not surprising that Shilabhattarika turned out to be a poetess of a high order.

## 15. Golden Globe Race

**Why in News?**
Commander Abhilash Tomy (retd.) created history as the first Indian to complete the Golden Globe Race on April 29, finishing in second place after a gruelling 236 days alone at sea in his sail boat named *Bayanat*. South African sailor Kirsten Neuschafer also became the first woman to win the Golden Globe Race (GGR), a solo, non-stop circumnavigation of the globe without using any modern technological aids, recreating the 1960s on the high seas.

### About Golden Globe Race (GGR)

- The historic race is being conducted by the **K.'s Sir Robin Knox Johnston**, to commemorate the world's first solo non-stop circumnavigation undertaken by him in 1968, **onboard the Indian-built boat *Suhaili*.**
- Participants in the GGR are required to sail around the world, **single-handed and non-stop.**
- The uniqueness of the race is that **boat designs and technology newer than 1968 are not permitted**.
- Also the use of the **Global Positioning System** (GPS), satellite communication and navigational aids are forbidden in the 30,000 mile journey.
- The sailors each have a **satellite phone** and **emergency locator beacons** to be used for medical emergencies only.
- Entrants are limited to sailing similar yachts, between 32 ft and 36 ft, designed prior to 1988 with a full-length keel with a rudder.
- Equipment similar to what was available to Sir Robin in that first race was to be used.
- 16 sailors from 11 countries depart from **Les Sables-d'Olonne, France**.
- Sail solo, non-stop around the world, via the **five Great Capes** and **return to Les Sables-d'Olonne.**

### About Cdr.Abhilash Tommy

- Abilash Tommy is the only Indian to complete a solo, non-stop circumnavigation of the globe in 2012-13, onboard the Indian Naval Sailing Vessel (INSV) Mhadei, covering 53,000 nautical miles under sail.
- The naval veteran had been critically injured in a storm when he competed in the GGR in 2018 and had a spinal injury. The mast of his boat *Thuriya*broke due to extremely rough weather and sea conditions.

## 16. Saurashtra-Tamil Sangam

**About:**

- It is a **program** that **highlights the oneness of India's culture** by narrating untold histories of how a community **emigrated to Tamil Nadu** and their contributions to the country.
- The **Saurashtra Tamil Sangam** will be held at **Somnath, Dwarka** and **other places in Gujarat to connect Tamil Nadu and Saurashtra.**
- It will celebrate the civilisational links between people from the southern part of the country and the People from the Saurastra and Kedarnath in the north.
- It is a **unique attempt where States shared their culture,** civilisation and heritage with each other, and the country united in soft power.
- The STS is the **second such programme** under the '**Ek Bharat, Shreshtha Bharat' initiative.**
- The first one was the **'Kashi Tamil Sangamam'**, a month-long event held last year to "rediscover" links between **Varanasi and Tamil Nadu**

**More about Saurashtra Region:**

- Saurashtra, also known as **Sorath or Kathiawar,** is a **peninsular region** of Gujarat, India, located on the **Arabian Sea coast.**
- It covers about a **third of Gujarat state**, notably **11 districts of Gujarat**, including Rajkot District.
- Saurashtra peninsula is bounded on the **south and south-west by the Arabian sea,** on the **north-west by the Gulf of Kutch** and on the **east by the Gulf of Khambhat.**
- From the apex of these two gulfs, the **Little Rann of Kutch and Khambhat, waste tracts half salt morass** half sandy desert, stretch inland towards each other and complete the isolation of Kathiawar, **except one narrow neck which connects it on the north-east with the mainland of Gujarat.**

# INTERNATIONAL AFFAIRS

## 1. Finland joins NATO bloc

**Concept:**

- **Finland** officially became the **31st member of the North Atlantic Treaty Organization (NATO).**
- This latest move marks a major shift in the security landscape in northeastern Europe amidst the ongoing Russia-Ukraine war.
- e. now that Finland has joined NATO, if Finland is invaded or attacked, all NATO members would come to its aid.
- The move also marks **the end of an era of military non-alignment for Finland.**
- Finland, after **repelling an invasion attempt by the Soviet Union during the Second World War, had opted for non-alignment and maintain friendly relations with Russia**.
- Finland's accession is seen **as a setback for Russia as Finland shares a 1,340-km eastern frontier with Russia.**
- Russia has said that it **would strengthen its military capacity in its western and northwestern regions in response to the move.**

**North Atlantic Treaty Organization:**

- It is an **intergovernmental military alliance.**
- Established by **Washington treaty** that was signed on 4 April 1949.
- **Headquarters — Brussels, Belgium**.
- Headquarters of Allied Command Operations — Mons, Belgium.

**Significance:**

- It constitutes a system of collective defence whereby its independent member states agree to mutual defence in response to an attack by any external party.

**Composition:**

- Since its founding, the admission of new member states has increased the alliance from the original 12 countries to 30. The most recent member state to be added to NATO was North Macedonia on 27 March 2020 (Before Finland).
- NATO membership is open to "any other European state in a position to further the principles of this Treaty and to contribute to the security of the North Atlantic area."

**Objectives:**

- **Political** – NATO promotes democratic values and enables members to consult and cooperate on defense and security-related issues to solve problems, build trust and, in the long run, prevent conflict.
- **Military** – NATO is committed to the peaceful resolution of disputes. If diplomatic efforts fail, it has the military power to undertake crisis-management operations.
- These are carried out under the **collective defence clause of NATO's founding treaty** – **Article 5 of the Washington Treaty** or under a United Nations mandate, alone or in cooperation with other countries and international organizations.

**NATO membership:**

- NATO had 30 members before the accession of Finland.
- In 1949, there were **12 founding members of the Alliance**: Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom and the United States.
- The **other member countries** are: Greece and Turkey (1952), Germany (1955), Spain (1982), the Czech Republic, Hungary and Poland (1999), Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia and Slovenia (2004), Albania and Croatia (2009), Montenegro (2017) and North Macedonia (2020).


## 2. Olkiluoto 3 nuclear reactor (OL3)

**Concept :**

- Finland's next-generation Olkiluoto 3 nuclear reactor, the largest in Europe, has gone into regular production.

**About Olkiluoto 3 nuclear reactor (OL3):**

- OL3 is an EPR (European Pressurized Water Reactor) located in Finland.
- It is built by the French-led Areva-Siemens consortium.
- It is the most powerful nuclear reactor in Europe, with a capacity of generating 1,600 megawatts.
- It covers approximately 14% of Finland's electricity demand.

Olkiluoto nuclear plant

# INTERNATIONAL ORGANIZATIONS

**1. India to have more people than China by mid-2023: UN**

**Concept :**

- India is probably the world's most populous country already. The latest estimates from the United Nations (UN) say India's population is expected to surpass that of mainland China by around 3 million people by the end of June 2023.

**Key-highlights of the UN Report**

- According to demographic data from the **United Nations Population Fund's** (UNFPA)-
- **Grouping the population**
  - 25 percent of India's population is estimated at below 14 years old
  - 18 percent is estimated in the 10-19 year age group
  - 26 percent in the 10-24 year bracket
  - 68 percent in the 15-64 year age group
  - 7 percent is estimated to be over 65 years old
- In contrast, 17% of China's population is estimated to be below 14 years of age, and 14 percent is estimated to be above 65 years old.
- The UN report estimates India's population will hit 1428.6 million my mid-2023, while China's (excluding Hong Kong and Macao, Special Administrative Regions of China, and Taiwan Province of China) is estimated to reach 1425.7 million.
- Asia's third-largest economy will soon house almost a fifth of humanity, more than the populations of Europe, Africa, or the Americas.
- **Distant third:** The United States is estimated to be a distant number three in the rankings, with nearly 340 million people.
- The report says eight countries will account for half the projected growth in global population by 2050: the Democratic Republic of the Congo (DRC), Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines and Tanzania.

**What does the Indian government's data show?**

- Data from the Indian government, meanwhile, says India's annual population growth has averaged 1.2 percent since 2011, compared with 1.7 percent in the 10 years previously.

**United Nations Population Fund**

- It is a **subsidiary organ of the UN General Assembly** and works as a **sexual and reproductive health agency.**
- The **UN Economic and Social Council (ECOSOC) establishes its mandate**.
- It was established as a **trust fund in 1967 and began operations in 1969**.
- In 1987, it was officially renamed the United Nations Population Fund but the original abbreviation, 'UNFPA' for the United Nations Fund for Population Activities was retained.
- **UNFPA works directly to tackle Sustainable Development Goals on health (SDG3), education (SDG4) and gender equality (SDG5).**
- **UNFPA is not supported by the UN budget, instead**, it **is entirely supported by voluntary contributions** of donor governments, intergovernmental organizations, the private sector, foundations and individuals.
- The **State of World Population report is UNFPA's annual flagship publication**.
- HQ :**New York**

# INTERNATIONAL RELATIONS

## 1. Comprehensive and Progressive Agreement For Trans-Pacific Partnership

**Concept :**

- **The UK acceded to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP),** with Prime Minister Rishi Sunak describing the outcome as an example of "post-Brexit freedoms".
- The agreement will now need to be ratified by Westminster and each of the CPTPP countries.
- The country will become the first new member, and the first in Europe, to join the agreement since it came into force in 2018.
- The deal is a "**gateway" to the Indo-Pacific region** which would account for a majority (54%) of global economic growth in the future.
- It **will also, as a CPTPP member, get a veto on whether China joins the treaty.**

**About CPTPP**

- The CPTPP, also known as TPP-11, is a **free trade agreement with 11 members**: **Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, Peru, New Zealand, Singapore and Vietnam**.
- The eleven signatories have combined economies representing 13.4 percent of global gross domestic product, at approximately US$13.5 trillion, making the CPTPP one of the world's largest free-trade areas by GDP, along with the United States–Mexico–Canada Agreement, the European Single Market, and the Regional Comprehensive Economic Partnership.
- It **succeeded the Trans-Pacific Partnership after the United States withdrew under former President Donald Trump in 2017.**
- The bloc is home to more 500 million people and will be worth 15% of global GDP once the United Kingdom joins.
- **Beijing had applied to become a member** of the bloc in September 2021.
- The **CPTPP commission in 2023 is chaired by New Zealand.**
- **All 11 countries of CPTPP are members of the Asia-Pacific Economic Cooperation (APEC).**

**Asia-Pacific Economic Cooperation (APEC)**

- It is a forum of **21 Asia-Pacific economies established in 1989**.
- **Members:** Australia; Brunei Darussalam; Canada; Chile; People's Republic of China; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; the Philippines; the Russian Federation; Singapore; Chinese Taipei; Thailand; the United States of America; Vietnam.
- It seeks to promote free trade and economic cooperation throughout the Asia-Pacific region.
- The **APEC Secretariat, headquartered in Singapore**, provides advisory and logistic services as well as research and analysis.
- **APEC decisions are reached by consensus**, and **commitments are made on a voluntary basis.**

## 2. Can countries be sued over climate change?

**Concept :**

- The International Court of Justice (ICJ) has been asked to provide an opinion on what kind of obligations countries have towards climate change reduction, based on the promises they have made to the UNFCCC.

**Details**

- Recently, the **UNGA passed a resolution seeking opinion from the ICJ** regarding the **accountability of countries** towards climate change reduction, **based on the promises they have made by these countries to the UNFCCC.**
- The **resolution passed by consensus** had been **pushed through by one of the smallest countries in the world, the Pacific Island of Vanuatu.**
- This island was devastated in 2015 by the effects of Cyclone Pam, believed to have been spurred by climate change.

**What does the resolution seek?**

- Asked the ICJ to deliberate on two questions
- What are the obligations of states under international law to ensure the protection of the climate system for present and future generations?
- What are the legal consequences under these obligations for states where they, by their acts and omissions, have caused significant harm to the climate system?
- The resolution **refers to several international protocols including the Paris Agreement (2015), the United Nations Convention on the Law of the Sea and even the Universal Declaration of Human Rights.**
- The entire process is expected to take **about 18 months for the ICJ to deliberate and deliver its opinion.**

**India's position**

- **Cautiously silent about the move**
- India has thus far been **cautiously silent about the move**, although it is generally supportive of the need for climate justice.
- India is also **vocal in holding the developed world accountable for global warming.**
- It has referred the resolution to legal authorities in the country who will look into the implications and international ramifications of the ICJ opinion.
- India **did not co-sponsor the draft resolution**
- India **did not join the overwhelming majority of countries that co-sponsored** the draft resolution.
- **Wait and watch mode**
- India is watching how global powers like the U.S. and China respond to the resolution, as without their support, it will be hard to implement.
- **India does not want top-down approach in climate change discussion**
- India was among the countries which voiced concerns about whether launching a judicial process was the best way to reach shared goals.
- Successfully tackling the climate crisis is best achieved via diplomatic efforts.
- As per India, top-down approach is not needed in the discussion around climate change.

**Is the advisory opinion of the ICJ binding?**

- The **ICJ is being asked for an advisory opinion**, which by **definition would not be legally binding as an ICJ judgment.**
- However, its clarification of international environmental laws would make the process more streamlined.
- The **ICJ opinion would carry legal weight and moral authority in dealing with contentious issues such as:**
- climate reparations by the developed world,
- legal culpability for countries that do not achieve their NDC promises, and
- climate support to the most vulnerable parts of the world battling the effects of global warming.
- This is significant as according to the latest IPCC Synthesis report, global climate levels have already increased 1.1 degrees since pre-industrial levels in the past century.
- Deep cuts in greenhouse gas emissions reductions, as much as by a half, are required by 2030 to keep this goal.

**3. IMF approves \$15.6billion loan to Ukraine**

**Context**:

- The International Monetary Fund (IMF) has approved a \$15.6bn support package for Ukraine to assist with the conflict-hit country's economic recovery, the fund has said.
- The Russian invasion has devastated Ukraine's economy, causing activity to contract by around 30 percent last year, destroying much of its capital stock and fuelling poverty, according to the IMF.
- The 48-month Extended Fund Facility (EFF) programme approved by the fund's board is worth roughly \$15.6bn.
- It forms the IMF's portion of a \$115bn overall support package comprised of debt relief, grants and loans by multilateral and bilateral institutions, the organisation confirmed in a press conference Friday.
- The IMF recently changed its rules to allow loan programmes for countries facing "exceptionally high uncertainty".

**About EFF:**

- It is a fund created by **IMF** for helping economies to address serious **medium-term balance of payments problems** because of **structural weaknesses** that require time to address.
- Assistance under an extended arrangement features longer program engagement to help countries implement medium-term structural reforms with a longer repayment period.
- It provides for support for comprehensive programs including the policies needed to correct structural imbalances over an extended period.
- Typically approved for periods of three years, but may be approved for periods as long as 4 years (repaid over 4.5–10 years in 12 equal semiannualinstallments unlike Stand-By Agreement facility which provides support for short period with repayment period of 3.5–5 years.)

**Conditions to get help**

- When a country borrows from the IMF, it commits to undertake policies to overcome economic and structural problems
- The IMF's Executive Board regularly assesses program performance and can adjust the program to adapt to economic developments.
- Lending is tied to the IMF's market-related interest rate, known as the basic rate of charge, which is linked to the Fund's Special Drawing Rights (SDR) interest rate.
- EFF is guided by a country's financing needs, capacity to repay, and track record with past use of IMF resources:
- Normal access: Borrowing under an EFF is subject to the normal limit of 145 percent annually of a country's IMF quota, (IMF quota broadly reflects a country's position in the global economy), and a cumulative limit over the life of the program of 435 percent of its quota, net of scheduled repayments.

- Exceptional access: The Fund may lend amounts exceeding these limits in exceptional circumstances provided that a country satisfies a predetermined set of criteria.

## 4. Sudan factions delay post-coup deal on civilian rule

**Context:** Sudanese leaders have postponed the signing of an agreement planned for Saturday to resume a short-lived democratic transition, an official has said, amid continued disagreement between military factions.



| Country | Geographical Location | Bordering Countries | Capital |
|---|---|---|---|
| Sudan | • North-Eastern Africa<br>• North of Equator | • Egypt<br>• Libya<br>• Chad<br>• Central African Republic<br>• South Sudan<br>• Ethiopia<br>• Eritrea<br>• Red Sea | Khartoum |

## 4. OPEC Plus announces oil production cuts

**Concept :**

- **Saudi Arabia and other OPEC+ oil producers** announced further oil output cuts of around 1.16 million barrels per day, in a surprise move that analysts said would cause an immediate rise in prices and the United States called inadvisable.
- The **pledges bring the total volume of cuts by OPEC+,** which groups the Organization of the Petroleum Exporting Countries with Russia and other allies, to 3.66 million bpd according to Reuters calculations, **equal to 3.7% of global demand**.

**OPEC and OPEC+**

- Established in 1960 by founding members **Iran, Iraq, Kuwait, Saudi Arabia and Venezuela,** OPEC has since expanded and now has 13 member states.
- Member countries are: **Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, United Arab Emirates, Venezuela**.
- Qatar terminated its membership on 1st January 2019.
- **OPEC+ :**
- With the **addition of another 10 allied major oil-producing countries**, the **OPEC is known as OPEC+.**

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- **OPEC+ countries include 13 OPEC member countries, Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan and Sudan**.
- The objective of the organization is to coordinate and unify the petroleum policies of its Member Countries and ensure the stabilisation of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital for those investing in the petroleum industry.
- Previously controlled by western-dominated multinational oil companies known as the "Seven Sisters," **OPEC sought to give the oil-producing nations greater influence over the global petroleum market.**
- They **account for roughly 40 % of the world's crude oil and 80 % of the globe's oil reserves**, according to estimates from 2018.
- They **usually meet every month to determine how much oil the member states will produce.**
- However, **many allege that OPEC behaves like a cartel**, **determining the supply of oil and influencing its price in the world market.**

## 5. Demand for Scottish Independence

**Concept :**

- Recently, the British Prime Minister rejected a call from the new First Minister of Scotland, Humza Yousaf, to hold a second referendum for Scotland's independence from the U.K.

**Historical background**

- The independent Kingdom of Scotland was formed in the 9th century and it indulged in various wars to remain independent from the Kingdom of England.
- The two kingdoms, however in 1603, signed a personal union agreement and were ruled by the same monarchs.
- Further, in **1707, both British as well as Scottish Parliaments enacted the Acts of Union to enter into a political union under the name of Great Britain** on account of various economic and political vulnerabilities prevailing on both sides.
- Despite Scotland retaining some of its decision-making powers, it however failed to get equal representation in the united Parliament which gave rise to various cultural and political differences.
- Also, the demands for self-governance started to become more prevalent which led to two referendums in 1979 and 1997 and the subsequent formation of a Parliament of Scotland in 1999.
- This newly devolved Parliament of Scotland was empowered to formulate legislations on issues like health, transport, education, etc. whereas the powers to legislate on issues such as defence, currency, trade, and foreign policy were reserved.
- The **latest referendum for Scottish independence was held in 2014**, wherein 55% of the Scottish population voted in favour of the union whereas 45% voted to walk out.



**What is the main case for independence?**

- Those who support independence believe Scotland "would be richer" if it breaks from England.
- Proponents of independence want Scotland to make its own decisions about how resources are controlled and money is invested.
- Rather than investing billions of pounds in nuclear weapons, for example, they would focus on things like childcare or programs to retain talent and encourage young Scots to stay.
- **Brexit :**
- In Brexit referendum a clear majority of Scots voted 'Remain'. Yet they were forced to leave.
- So the issue of self-determination has been brought back to the political agenda.

## Tools of Direct Democracy

- **Referendum** – procedure in which a proposed legislation is referred to the electorate for acceptance through direct voting.
- **Initiative** – method by means of which the people can propose a bill to the legislature for enactment.
- **Recall** – way for voters to remove a representative or an officer before the expiry of his/her term, when he fails to discharge his duties properly.
- **Plebiscite** – method of obtaining the opinion of people on any issue of public importance. It is generally used to solve territorial disputes.

## 6. How IOC decision on army-linked athletes cripples Russia Olympic hopes

**Context**: The International Olympic Committee recommended individual athletes from Russia and Belarus should be allowed to return to competition under a neutral status as long as they have no military incantational Olympic Committee **Concept :**

- 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.

## 7. UN Statistical Commission

**Concept :**

- India has been elected to the highest statistical body of the United Nations for a four-year term beginning January 1, 2024.

## About UN Statistical Commission

- The **United Nations Statistical Commission, established in 1947**, is the highest body of the global statistical system bringing together the Chief Statisticians from member states from around the world.
- It is the **highest decision-making body for international statistical activities**, **responsible for setting of statistical standards** and the development of concepts and methods, including their implementation at the national and international level.
- The **Statistical Commission oversees the work of the United Nations Statistics Division (UNSD)**, and it **is a Functional Commission of the UN Economic and Social Council.**
- **Sessions :** The 54th session of the United Nations Statistical Commission was held on 28 February – 3 March 2023.
- **Mandate :**
- The **Statistical Commission** was **established by the Economic and Social Council. Commission** shall assist the Council:
  - In promoting the development of national statistics and the improvement of their comparability;
  - In the coordination of the statistical work of specialized agencies;
  - In the development of the central statistical services of the Secretariat;
  - In advising the organs of the United Nations on general questions relating to the collection, analysis and dissemination of statistical information;
  - In promoting the improvement of statistics and statistical methods generally.
- **Items considered**
- The Statistical Commission considers special issues of concern in international statistical development, methodological issues, coordination and integration of international statistical programmes, support of technical cooperation activities in statistics and organizational matters.
- **Frequency of meetings**

- In July 1999 the Economic and Social Council decided that the Commission should meet annually for four days each session, starting in the year 2000.
- **Membership**
- The Commission **consists of 24 member countries of the United Nations** elected **by the United Nations Economic and Social Counci**l on the basis of an equitable geographical distribution according to the following pattern:
  - Five members from African States;
  - Four members from Asia-Pacific States;
  - Four members from Eastern European States;
  - Four members from Latin American and Caribbean States;
  - Seven members from Western European and other States.
- The **term of office of members is four years.**
- **Bureau**
- The **officers of the Commission, also referred to as the Bureau, are the Chairman, 3 Vice-chairmen and the Rapporteur.**
- **About United Nations Economic and Social Council**
- The Economic and Social Council is at the heart of the United Nations system to advance the three dimensions of sustainable development – economic, social and environmental.
- It is the central platform for fostering debate and innovative thinking, forging consensus on ways forward, and coordinating efforts to achieve internationally agreed goals.
- It is also responsible for the follow-up to major UN conferences and summits.
- The **UN Charter established ECOSOC in 1945 as one of the six main organs of the United Nations.**

## 8. IFC says to stop funding new coal related infra projects

**Concept :**

- The **International Finance Corporation** (IFC), which is the **private sector division of the World Bank Group,** has held that it will not support investments in new coal-related projects.
- The International Finance Corporation (IFC) extends **funds to banks and other financial institutions to promote infrastructure and energy projects.**
- The IFC has so far lent around $5 billion to about 88 financial institutions in India.
- In 2023, the IFC is looking to undertake various steps which are in line with the Paris Agreement ambitions.
- The IFC is looking to **mandate a commitment from financial institution clients to not originate and finance any new coal projects.**
- In 2020, the IFC announced a policy that **mandated clients to reduce their exposure to coal projects by half by 2025, and to zero by 2030**, however, it did not halt any new investments, but the latest update disallows this too.

**About the International Finance Corporation (IFC):**

- It is an **international financial institution** that offers **investment, advisory, and asset management services to encourage private sector development** in **developing countries.**
- It is a **member of the World Bank Group and is headquartered in Washington, D.C.,** United States.
- It was established in 1956 as the private sector arm of the World Bank Group to advance economic development by investing in strictly for-profit and commercial projects that purport to reduce poverty and promote development.
- The **IFC is owned and governed by its member countries**, but has its own executive leadership and staff that conduct its normal business operations.
- It is a **corporation whose shareholders are member governments** that provide paid-in capital and which have the right to vote on its matters.

**Roles and functions:**

- Since 2009, the IFC has focused on a set of development goals that its projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve healthcare and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.
- It offers an array of debt and equity financing services and helps companies face their risk exposures while refraining from participating in a management capacity.
- It advises governments on building infrastructure and partnerships to further support private sector development.

## 9. Japan circumventing sanctions on Russian oil

**Concept :**

- Japan has been purchasing oil from Russia at a price above the $60 per barrel price cap imposed by the West, according to reports this week.
- This has led to speculation that Japan may be breaching an agreement reached last year to cap the price of Russian oil.

**Cap on Russian Oil**

- The **G-7 countries, the EU, and Australia imposed a $60 per barrel price cap on oil purchased from Russia** starting in December 2022.
- The move was **part of the wider economic sanctions** imposed by the West to punish Russia following its invasion of Ukraine.
- This was to **restrict the amount of money that Russia can make by selling its oil**, but without severely affecting the global oil supply.

**Why is Japan breaking ranks with the West?**

- While many European countries have reduced their dependence on Russian energy supplies, **Japan has stepped up its purchases of Russian natural gas over the past year.**
- **Japan** is the **only Group of Seven nation not to supply lethal weapons to Ukraine,** and Prime Minister Fumio Kishida was the last G-7 leader to visit Ukraine after Russia's invasion.
- Japan got the U.S. to agree to the exception as it needed it to ensure access to Russian energy. The concession shows Japan's reliance on Russia for fossil fuels.
- Japan has almost no fossil fuel of its own and relies on imported natural gas and coal for much of its electricity.
- Russia accounts for nearly one-tenth of Japan's natural-gas imports.
- Japan's oil import contributes very little to Russia's overall oil production, which was about 10.7 million barrels per day in 2022, and thus does not significantly subvert the West's efforts to restrict the Kremlin's oil revenues.
- **Japan was granted an exception to the cap for oil purchased from the Sakhalin-2 project in Russia's Far East.**

**Will rising oil prices threaten the West's price cap?**

- OPEC and Russia decided to cut their oil output by 3.66 million barrels per day, sending oil prices soaring 6%.
- Russian urals, the flagship crude oil sold by Russia, also soared above $60 per barrel, thus breaching the West's price cap.
- When the West first imposed its price cap, it had no effect on Russia's oil output or revenues as Russian urals were trading well below $60 per barrel.
- But now with urals trading above $60 per barrel, things might turn out to be different.
- The West would hope that its price cap would keep Russia's oil revenues in check despite rising oil prices.
- Russia, which has seen its oil revenues drop due to subdued oil prices and the West's ban on Russian oil, will be hoping to turn the corner by bypassing Western sanctions and selling oil above the price cap.
- This will test the West's ability to effectively implement its price cap.

**10. Saudi Oman team to talk to Houthis to end Yemen war**

**Concept :**

- A Saudi Omani delegation is planning to travel to Yemen's capital Sanaa next week to hash out a permanent ceasefire deal with Houthi officials and end the country's eight year old conflict.
- It is also a sign that regional rifts are easing after rivals Saudi Arabia and Iran agreed to restore relations last month after years of hostility and backing opposite sides in Middle Eastern conflicts, including Yemen.

**Yemen Conflict:**

- Since 2014, Yemen has been facing a multi-sided conflict involving local, regional, and international actors.
- The Houthis, who ruled a kingdom there for nearly 1,000 years, used widespread anger against President Hadi's decision to postpone long-awaited elections and his stalled negotiations over a new constitution.
- They marched from their stronghold of Saada province to the capital Sanaa and surrounded the presidential palace, placing Hadi under house arrest.

**Saudi Arabia's Intervention:**

- A military coalition led by Saudi Arabia intervened in Yemen in March 2015, at Hadi's request, after the Houthis continued to sweep the south and threatened to conquer the last government stronghold of Aden, prompting one of the world's worst humanitarian crises ever.

**Houthis**

- **Yemen is located at the junction of the Red Sea and Gulf of Aden, its coastline commanding the strategic strait of Bab al-Mandab.**
- The country has been wracked by civil war for more than seven years now, and the Houthis control the western part of the country, including the capital Sana'a.
- The **Houthis are a large clan belonging to the Zaidi Shia sect**, with **roots in Yemen's north western Saada province.** Zaidis make up around 35 per cent of Yemen's population.
- The **Zaid is ruled over Yemen for over a thousand years until 1962**, **when they were overthrown and a civil war followed, which lasted until 1970**.

- The Houthi clan began to revive the Zaidi tradition from the 1980s, resisting the increasing influence of the Salafists, who were funded by the state.
- In 2004, the Houthis began an insurgent movement against the Yemeni government, naming themselves after the political, military, and religious leader Hussein Badreddin al-Houthi, who was assassinated by Yemeni security forces in September of that year.
- Several years of conflict between the Houthis and Yemen's Sunni majority government followed.
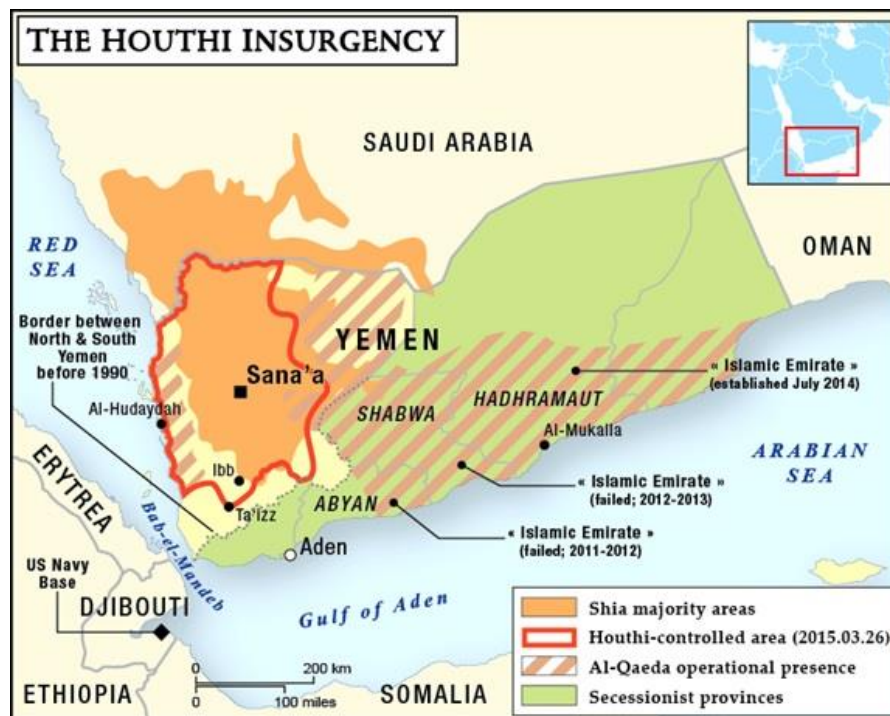


**Zaydis**

- Zaydis are the **oldest branch of the Shia**.
- The **Zaydis are named after Zayd Bin Ali, the great grandson of Imam Ali,** Prophet Mohammed's cousin and son-in-law who Shias, Sunnis and Zaydis revere.
- Zayd Bin Ali had led a revolt against the Ummayad Caliphate in the eighth century. He was killed, but his martyrdom led to the rise of the Zaydi sect. While the Zaydis are seen part of the Shia branch of Islam, both in terms of theology and practice, they are different from the 'Twelver' Shias of Iran, Iraq and Lebanon.
- For centuries, the Zaydis were a powerful sect within Yemen.
- After the collapse of the Ottoman Empire in 1918, the Zaydis would establish a monarchy (the Mutawakkilite Kingdom) in the country. But their dominance would come to an end in 1962 when the Egypt-backed republicans overthrew the monarchy.

## 11. 75 Years of World Health Organisation

**Concept :**

- The World Health Organization (WHO) was born when its constitution came into effect on April 7, 1948.

**How is the WHO governed?**

- The **WHO is headquartered in Geneva and has six regional and 150 country offices**.
- It is controlled by delegates from its 194 member states, who vote on policy and elect the director general.
- Tedros Adhanom Ghebreyesus, previously Ethiopia's foreign minister, was elected to a five-year term in 2017 and reelected in 2022.
- WHO delegates set the agency's agenda and approve an aspirational budget each year at the World Health Assembly.
- The director general is responsible for raising the lion's share of funds from donors.

**Success**

- Some of the WHO's most lauded successes include **its child vaccination programs, which contributed to the eradication of smallpox in 1979** and a **99 percent reduction in polio infections in recent decades,** and its leadership during the 2003 **severe acute respiratory syndrome (SARS) epidemic.**
- The agency has the **exclusive authority to declare global health emergencies**, which it has done several times since its members granted it the power in 2007.

- WHO has **undertaken reforms to improve its ability to fight future epidemics** and boost the health of the hundreds of millions of people still living in extreme poverty.

**Failures**

- The organization's **agreement to give up on trying to eradicate malaria in the 1960s** represents another example of what some consider a botched job.
- Many critics have faulted the **WHO for slow and poorly coordinated responses to outbreaks.** That includes **the 2014 Ebola outbreak**, in which it waited five months before declaring a PHEIC, despite pleas from groups such **as Doctors Without Borders.**
- WHO is in an **uphill battle to loosen its rigid bureaucracy and it faces an increasingly troublesome budget.**
- The **COVID-19 pandemic has proved to be another monumental challenge** for the health agency, sparking fresh debate over its effectiveness.
- The WHO has become **increasingly dependent on voluntary contributions**, which puts pressure on the organization to align its goals with those of its donors.
- **What reforms has the WHO made?**
- Responding to these criticisms, the organization instituted several reforms intended to improve its responses, including the **creation of a reserve force of public health workers and a $100 million emergency fund.**
- The WHO also added an **incident management system** that allows it to place medical responders, equipment, and supplies such as medicines on the ground right away while it coordinates a broader response.
- In a rare special session of the **WHO's World Health Assembly in 2021**, delegates initiated the drafting of a **global treaty on pandemic prevention, preparedness, and response.**
- At the 2022 assembly, **countries agreed on a U.S.-led proposal to strengthen the IHR by increasing member states' accountability around disease outbreaks,** though no changes have been formally approved.

For further notes on WHO , refer – https://optimizeias.com/world-health-organization/

**12. Language Friendship Bridge**

**Concept :**
**About the Project**

- The **Indian Council for Cultural Relations** (ICCR) has envisaged a special project called '**The Language Friendship Bridge**', which plans to **train five to 10 people in the official languages of Myanmar, Sri Lanka, Uzbekistan, Indonesia.**
- **Aim :**
- To expand its cultural footprint in nations with which it has historical ties.
- To facilitate better people-to-people exchanges.
- **Languages :**
- As of now, **the ICCR has zeroed in on 10 languages**: Kazakh, Uzbek, Bhutanese, Ghoti (spoken in Tibet), Burmese, Khmer (spoken in Cambodia), Thai, Sinhalese and Bahasa (spoken in both Indonesia and Malaysia).
- Experts also feel that the ICCR's list of languages needs to be expanded, with India seeing a boom in cultural and economic ties with other neighbouring countries as well.

**How will it be done?**

- There are **two possibilities.**
- One is to start tie-ups wherein teachers from these countries come and teach courses in India.
- The second approach is the ICCR offering scholarships to Indian students to go and study these languages in the countries where they are spoken.
- Language experts feel that the second option is the better one as a proper cultural environment is needed to learn a language in its entirety.

**About ICCR**

- The **Indian Council for Cultural Relations (ICCR),** is an **autonomous organisation**of the Government of India, involved in India's global cultural relations, through cultural exchange with other countries and their people.
- It was **founded on 9 April 1950 by Maulana Abul Kalam Azad,** thefirst Education Minister of independent India.
- The **ICCR Headquarter is situated at Azad Bhavan, New Delhi**, with regional offices.
- The council also operates missions internationally.

**Activities**

- The Council addresses its mandate of cultural diplomacy through a broad range of activities.
- In addition to **organising cultural festivals in India and overseas**, the ICCR **financially supports a number of cultural institutions across India**, and sponsors **individual performers** in dance, music, photography, theatre, and the visual arts.

- It also **administers the Jawaharlal Nehru Award for International Understanding**, established by the Government of India in 1965, whose last award was in 2009.

## 13. International Prize Of Statistics

**Concept :**

- Calyampudi Radhakrishna Rao, an **Indian-American statistician**, has been awarded the **2023 International Prize in Statistics, the statistical equivalent of the Nobel Prize.**

**Contributions of Calyampudi Radhakrishna Rao**

- In 1945, Professor Rao's article, "Information and Accuracy Attainable in the Estimation of Statistical Parameters," was published. It encouraged the rapid growth of contemporary statistics and their use in research.
- In 1948, one of Professor Rao's publications proposed a revolutionary general technique for evaluating hypotheses, which became known as the "Rao score test." This and two other tests devised by Jerzy Neyman, E.S. Pearson, and Abraham Wald are commonly referred to as the "holy trinity" of statistics.
- Professor Rao's work has influenced statistics, economics, genetics, anthropology, geology, national planning, demography, biometry, and medicine.

**International Prize in Statistics**

- It is **awarded to an individual or group once every two years** "for significant breakthroughs utilising statistics to improve science, technology, and human welfare."
- The prize is **modelled after the Nobel Prize, Abel Prize, Fields Medal, and Turing Award, and it carries an $80,000 monetary award.**
- The International Prize in Statistics and the COPSS Presidents' Award are the two top honours in statistics.

## 14. Comstock Act 1873

**Concept :**

- A 19th century "anti-vice" law is at the center of a new court ruling that threatens access to the leading abortion drug in the U.S.
- Dormant for a half-century, the **Comstock Act has been revived by anti-abortion** groups and conservative states **seeking to block the mailing of mifepristone, the pill used in more than half of U.S. abortions.**

**Comstock Act**

- Originally passed in 1873 and named for an anti-vice crusader, the **Comstock Act was intended to prohibit the mailing of contraceptives, "lewd" writings and any "instrument, substance, drug, medicine, or thing" that could be used in an abortion.**
- The law's scope has been repeatedly narrowed by federal courts and Congress, which eliminated the reference to contraceptives in the 1970s. And the federal government hasn't enforced the law since the 1930s, according to legal experts.

**Current Issue over the law**

- The law was essentially dormant in the 50 years after Roe v. Wade established a federal right to abortion. And until the FDA loosened its requirements on **mifepristone** in 2021, there was no real way to enable abortion through the mail.
- But Rachel Rebouché of Temple University's law school says anti-abortion groups — emboldened by the Supreme Court decision overturning of Roe — have seized on Comstock to try and shut off the flow of abortion drugs.

**Medical Abortion**

- Medication abortion is a regimen of pills women can take at home, a method increasingly used around the world.
- **Mifepristone**, blocks a hormone called progesterone that is necessary for a pregnancy to continue.
- **Misoprostol,** brings on uterine contractions.
- Mifepristone, used along with misoprostol, is the most commonly used method of abortion in the US

## 15. Global Economic Prospects report

**Context**: WORLD BANK Group President David Malpass said on Monday that the lender has revised its 2023 global growth outlook slightly upward to 2 per cent from a January forecastof1.7per cent but the slowdown from stronger 2022 growth will increase debt distress for developing countries.

The upward revision was due to an improved outlook for China's recovery from Covid-19 lockdowns, with growth now pegged at 5.1 per cent this year compared to 4.3 per centin the bank's January **Global Economic Prospects report**

**About the Report**

- The World Bank produces the GEP twice a year, in January and June, as part of its in-depth analysis of key global macroeconomic developments and their impact on member countries.

- The GEP provides intelligence in support of achieving development goals and is a trusted resource for member countries, stakeholders, civil organizations and researchers.

## 16. Spring meeting6

- The IMF and World Bank meet each autumn in what is officially known as the **Annual Meetings of the International Monetary Fund and the World Bank Group** and each spring in the **Spring Meetings of the International Monetary Fund and the World Bank Group**. Names of the two groups are alternated each year so a different one has top billing.
- The autumn meetings are customarily held in Washington, D.C., United States for two consecutive years, and in another member country in the third year. At the spring and annual meetings there are meetings of the World Bank-IMF Development Committee and the International Monetary and Financial Committee (IMFC). Each committee is made of up ministers or central bank governors. There are equivalent numbers and the same constituency systems as is used at the Executive boards of the institutions. At the annual meetings, the governors of the World Bank and IMF also meet in plenary sessions.

## 17. UN Democracy Fund

**Concept** :

- That **India, a founding member of UNDEF**, has no objections to the Fund giving grants to NGOs funded by George Soros, while he is put on the watchlist in India underlines a contradiction that's not new.

**About UNDEF**
**Background :**

- **India and the US were prime movers behind the UN Democracy Fund** in 2005, when they were **negotiating the civilian nuclear co-operation deal**.
- As Joint Secretary (Americas) at the time, S Jaishankar was a lead negotiator.
- **UNDEF was created by UN Secretary-General Kofi A. Annan in 2005** as a United Nations General Trust Fund to **support democratization efforts around the world.**

**Role**

- UNDEF **funds projects that empower civil society, promote human rights, and encourage the participation of all groups in democratic processes.**
- The large **majority of UNDEF funds go to local civil society organizations.**
- In this way, UNDEF plays a novel and unique role in complementing the UN's other, more traditional work — the work with Governments — to strengthen democratic governance around the world.

**Finance**

- UNDEF subsists **entirely on voluntary contributions from Governments**; in 2021, it reached **almost 220 million dollars in contributions and counts more than 45 countries as donors**, including **many middle- and low-income States in Africa, Asia and Latin America.**
- In 15 Rounds of Funding so far, UNDEF has supported over 880 two-year projects in more than 130 countries.
- Grants ranging from US$100,000 to US$300,000 support initiatives in the areas of:
  - Support for Electoral Processes
  - Women's Empowerment
  - Media and Freedom of Information
  - Rule of Law and Human Rights
  - Strengthening Civil Society Interaction with Government
  - Youth Engagement

**UNDEF Composition:**

- The Advisory Board, constituted by the Secretary General, includes eight largest Member State contributors and six other states to reflect diverse geographical representation.
- **India has been a member of the Board since the beginning**.
- The Advisory Board considers the proposals from NGOs and recommends proposals for approval by the Secretary General.

**India's Contribution to UNDEF:**

- India gave $5 million to the fund in 2005, 2006, 2008, 2009 and 2011.
- The contributions began dipping from 2012 ($4.71 m) and the following year it was $1.85 million.
- After no contribution in 2017, India was back with $100,000 in 2018 and 2019. In 2020, 2021 and 2022, it gave $150,000.

**18. On Finland's journey to join NATO**

**Concept** :

- Finland, on April 4, 2023, joined the North Atlantic Treaty Organization (NATO) and became the 31st member of the Organization.

**Background:**

- Finland has joined NATO due to Russia's invasion of Ukraine, which has made its smaller neighbors feel the need for the powerful military backing that NATO provides. Finland and Sweden applied for NATO membership after the invasion.
- Finland which shares a 1,340-km border with Russia, has ended more than 70 years of military non-alignment — in fact, in the Cold War years, a **policy of neutrality between the Soviet Union and the West was known as 'Finlandisation',** and **Finlandisation had been one of the options discussed for Ukraine before Russia invaded it.**
- Experts, however, believe that Finland is not the first and would not be the last neighbour of Russia to join NATO.
- Before Finland, **countries like Norway (1949, and a founding member), Latvia (2004), Estonia (2004), Poland (1999) and Lithuania (2004) joined NATO.**

**Impacts of Joining NATO:**

- Finland has gained better security, but it is losing out on significant trade and tourism revenue it was making from Russia, and its status as a confidence-building presence in the Baltic Sea and Europe at large is being threatened.
- For NATO, the addition of Finland brings in a military trained to repel an attack from Russia and strengthens its position to station weapons closer to Russia.
- However, Russia sees this as a dangerous historical mistake that could escalate the Ukraine conflict and has said it will strengthen its military capacity in its west and northwest.

**Paasikivi's line:**

- Post the Second World War, the skilful diplomacy and pragmatism displayed by Finnish President Juho Kusti Paasikivi helped the country to save itself from the spread of communist ideology.
- In 1948, the Agreement of Friendship, Cooperation, and Mutual Assistance was signed between the USSR and Finland.
- Paasikivi's line was based on the idea of peaceful coexistence with the USSR and neutrality was the key motive. This helped Finland address the complexities in global geopolitics post the Second World War.
- This became popular as "**Finland's neutrality".**
- **About Finland**
- Finland is part of Scandinavia (a geographical region) in northern Europe, and shares land borders with Norway, Sweden, and Russia.
- Finland is heavily forested, with over 70 percent of the country covered by thick woodlands.
- Finland's underlying structure is a huge worn-down shield composed of granite dating from Precambrian time.
- The **Baltic Sea borders the country to the south and southwest**.
- The coastline of the country is contains nearly 180,000 small islands. Finland's remote **northern province, known as Lapland**, sits **above the Arctic Circle**.
- The **aurora borealis (northern lights) can be seen in the Lapland region regularly**.

**19. Israel- Syria Conflict**

**Concept :**

- Israel shelled parts of Syria, claiming it was in response to rockets being fired at **Golan Heights** from the neighboring country.

**Details**

- **al-Quds Brigade —** a **Damascus-based Palestinian militant group** loyal to the Syrian regime — claimed responsibility for the rocket attacks, saying they were launched in retaliation for the recent raids at the **al-Aqsa mosque** by the Israeli police.

**Why is the conflict boiling over recently?**

- With an ultra-nationalist government coming to power in Israel, the region has been simmering for months.
- Israeli police raided Jerusalem's **Al-Aqsa mosque, considered the third holiest site in Islam.**
- This served as the immediate trigger for a wave of rocket attacks, including from **Lebanon, the Gaza Strip, and Syria**.
- In Syria, Israel's actions come out of the fear that arch-rival Iran is using the long-running war in the country to station its fighters and weapons close to Israel's borders.
- Israel is also locked in a **conflict with the Hezbollah,** which holds **sway in another neighbour, Lebanon.**

## Who controls what in Syria

**Feb 2021**

Legend:
- Kurdish forces
- Turkish-backed Syrian rebels and Turkish military
- Syrian government
- Jihadist forces
- Syrian rebels
- Islamic State group

TURKEY

Aleppo
Idlib
Raqqa
Hassakeh
Deir al-Zour
SYRIA
Homs
IRAQ
Damascus
JORDAN
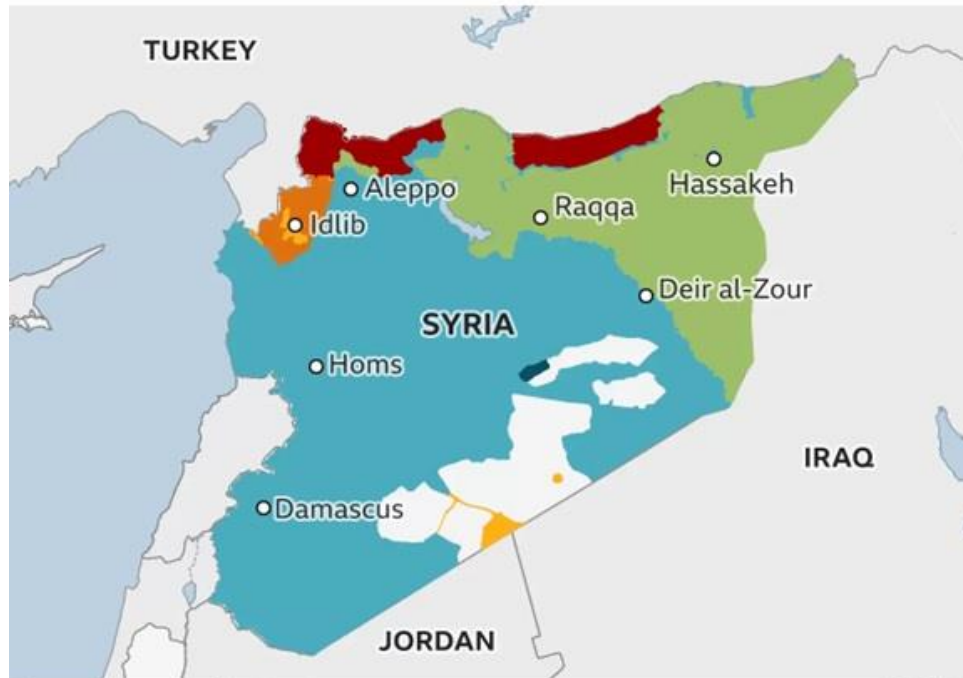
Source: Janes Conflict Monitor

BBC

**al-Aqsa Mosque & Associated Conflict**

- The al-**Aqsa Mosque is one of Jerusalem's most recognized monuments**.
- The site is part of the Old City of Jerusalem, sacred to Christians, Jews and Muslims.
- The **United Nations Educational, Scientific and Cultural Organization (UNESCO), has classified the Old City of Jerusalem and its walls as a World Heritage Site.**
- The mosque's complex is the reason for the conflict between Israel & Palestine (Islam & Judaism).
- **Al-Aqsa Mosque** is one of **Islam's most revered locations**, and the **Temple Mount is the holiest site in Judaism.**
- The **Temple Mount is a walled compound inside the Old City in Jerusalem**, and is the site of two structures:
- The **Dome of the Rock to the north** and the **Al-Aqsa Mosque to the south**.
- To the **southwest of the Temple Mount**, is the **Western Wall**, a remnant of the Second Temple and the holiest site in Judaism.

Areas which came under Israeli control after the 1967 war.

## 25 YEARS OF GOOD FRIDAY AGREEMENT

**Concept :**

- US President visited **Belfast, the capital of Northern Ireland**, to mark the 25th **anniversary of the Good Friday Agreement**.

**What were The Troubles?**

- Northern Ireland was created in 1921 and in 1922 the rest of Ireland gained independence from the British (the today's Republic of Ireland, with its capital in Dublin).
- Northern Ireland remained with the UK, but tensions simmered between those who wished to remain with the UK (Protestants) and those who wanted to join Ireland (Catholics).
- By the 1960s, the Protestants had become more powerful and the Catholics started facing discrimination.
- The violence erupted between both factions – The Troubles, claiming the lives of more than 3,500 people.

**Good Friday Agreement**

- The Good Friday Agreement was signed on April 10, 1998, **between factions of Northern Ireland, and the governments of Britain and Ireland, to end decades of violence in Northern Ireland** among those who wished to remain with the United Kingdom (UK) and those who wanted to join Ireland.
- The negotiators included then British Prime Minister Tony Blair, then Irish Prime Minister Bertie Ahern, George Mitchell, a former Democratic senator who acted as the envoy of then US President Bill Clinton, and eight parties from Northern Ireland.

**Terms of the Good Friday Agreement**

- **Northern Ireland would remain part of the UK, but could join Ireland** if, in a referendum, a majority of people on both sides voted for it.
- People **born in Northern Ireland could have Irish or British nationality or both**.
- **Weapons by paramilitary groups would have to be decommissioned**, but people in jail for violence so far would be released.
- **Northern Ireland would get a new government, where both the nationalists and unionists would be represented.**
- This devolved government would sit at Stormont and have powers over most local matters, while the UK government would look after security, foreign policy, tax laws, immigration rules, etc.

- On May 22, 1998, a referendum was held in Ireland and Northern Ireland, and the agreement was approved by 94 per cent of voters in Ireland and 71 per cent in Northern Ireland.

## INTERNATIONAL CONFERENCE ON DEFENCE, FINANCE AND ECONOMICS
### Concept :

- Defense Minister Rajnath Singh inaugurated the three-day International Conference on Defense Finance and Economics in New Delhi.

### About the conference

- The conference is **organized by the Ministry of Defence.**
- It will **provide a platform to eminent policy makers, academicians and government officials from home and abroad** to share their insights and experiences on defense finance and economics in the context of emerging security challenges and policies globally.
- Delegates from **USA, UK, Japan, Australia, Sri Lanka, Bangladesh and Kenya** are participating in the conference.

### Objective of the Conference

- To promote dialogue and cooperation among the participants and contribute to the defense preparedness of the country with optimum financial resources and effective implementation of the defense budget.
- Participating in global discussions on defense finance and economics and proposing a sustainable roadmap on the subject.
- To disseminate the best practices, experiences and expertise of various countries and align processes in the Indian context with international standards.

### The topics of discussion

- Current challenges and opportunities in the areas of Defence Finance and Economics, such as how to allocate and use resources efficiently & effectively.
- Different models and practices of finance and economics related to Defence Acquisition around the world.
- Latest developments and innovations in Defence Research and Development.
- Best practices on managing human resources in Defence, including issues related to pay, pensions and welfare of Defence Personnel and the role & functions of oversight mechanisms within defence ecosystems.

## INDIA, JAPAN AND FRANCE ANNOUNCE COMMON PLATFORM FOR SRI LANKA CREDITORS
### Concept:

- Japan, India and France have announced a common platform for talks among bilateral creditors to **coordinate restructuring of Sri Lanka's debt.**
- The move is **expected to serve as a model for solving the debt woes of middle-income economies.**
- Japanese Finance Minister Shunichi Suzuki told a briefing that to be able to launch this negotiation process with such a broad-based group of creditors is a historical outcome. He said **this committee is open to all creditors**.
- French Director General of the Treasury Emmanuel Moulin told the briefing that the group is ready to hold the first round of talks as soon as possible.

### Background

- The island nation of 22 million people last month secured a 2.9-billion-dollar programme from the International Monetary Fund to tackle its huge debt burden.
- But the middle-income economy could not apply for relief under the G-20's common framework for debt treatments, which targets only low-income countries.
- This has put the onus on major economies to come up with an alternative scheme, leading to the creation of the new platform.
- Sri Lanka owes 7**.1 billion dollars to bilateral creditors**, with **3 billion dollars owed to China, followed by 2.4 billion dollars to the Paris Clu**b **and 1.6 billion dollars to India**, according to official data from Sri Lankan government.

### Paris Club

- 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.
- It describes itself as a **forum where official creditors meet to solve payment difficulties faced by debtor countries.**
- Their objective is to **find sustainable debt-relief solutions for countries that are unable to repay their bilateral loans.**
- **Members:**
- 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.

- **All 22 are members of the group called Organisation for Economic Co-operation and Development (OECD).**

# GERMANY ENDS NUCLEAR ERA BY SHUTTING DOWN LAST THREE POWER PLANTS
**Concept :**

- Reaching its final step in quitting nuclear power, Germany on Saturday pulled the plug on its last three nuclear power stations, ending the country's nuclear era that began almost six decades ago.
- Berlin has an ambitious goal of turning to fully renewable electricity by 2035 and by shutting down the last three nuclear plants on Saturday, it reached a little bit closer to achieving its aim.

## Nuclear Plants

- The nuclear power stations of **Isar II, Emsland and Neckarwestheim II** have been completely shut down in a bid to end the country's reliance on energy that is perceived as dangerous and unsustainable.



## DALAI LAMA
**About:**

- Dalai Lama is a **title given** by the Tibetan people for the **foremost spiritual leader** of the **Gelug or "Yellow Hat"** school of Tibetan Buddhism, the newest of the classical schools of Tibetan Buddhism.
- The **14th** and current Dalai Lama is **Tenzin Gyatso.**
- He was **born on 6 July 1935**, to a **farming family**, in a small hamlet located in T**aktser, Amdo, northeastern Tibet.**
- At the **age of two**, the child, then named **LhamoDhondup**, was recognized as the reincarnation of the previous **13th Dalai Lama, Thubten Gyatso.**
- The Dalai Lamas are believed to be **manifestations of Avalokiteshvara or Chenrezig**, the **Bodhisattva of Compassion** and the **patron saint of Tibet**.
- Bodhisattvas are realized beings inspired by a wish to **attain Buddhahood** for the benefit **of all sentient beings,** who have vowed to be **reborn in the world** to help humanity.
- In his Holiness the **Dalai Lama 1989 he was awarded the Nobel Peace Prize** for his non-violent struggle for the liberation of Tibet.

**Concept:**

- Following the **Buddhist belief** in the **principle of reincarnation**, the current Dalai Lama is believed by Buddhists to be **able to choose the body** into which he is **reincarnated**.
- That person, when found, will then become the next Dalai Lama.
- According to Buddhist scholars it is the **responsibility of the High Lamas of the Gelugpa tradition and the Tibetan government** to seek out and find the next Dalai Lama following the death of the incumbent.
- If **more than one candidate is identified, the true successor is found by officials and monks drawing lots in a public ceremony**.
- Once identified, the s**uccessful candidate and his family are taken to Lhasa** (or Dharamsala) where the **child studies the Buddhist** scriptures in order to prepare for spiritual leadership.
- This process can take several years: it **took four years to find the 14th (current) Dalai Lama.**
- The search is g**enerally limited to Tibet, although the current Dalai Lama has said that there is a chance that he will not be reborn**, and that if he is, it will not be in a country under Chinese rule.

**Leadership Responsibility:**

- In **1950**, after **China's invasion of Tibet,** His Holiness was called upon to **assume full political power.**
- In **1954**, he went to **Beijing** and met with **Mao Zedong and other Chinese leaders,** including **Deng Xiaoping and Chou Enlai.**
- Finally, in **1959,** following the brutal suppression of the **Tibetan national** uprising in **Lhasa by Chinese troops,** His Holiness was **forced to escape into exile**.
- Since then he has been **living in Dharamsala**, northern India.

**Claim of suzerainty:**

- Communist China had always held a **claim of suzerainty over Tibet**, which included the **assertion that Tibet** had become a **"protectorate" of Manchu Ruled China** in the late 17th century.

## CHINESE DUAL-USE FACILITIES IN MYANMAR AND SRI LANKA
**Concept :**

- China's investment in dual-use facilities in Myanmar and Sri Lanka has raised concerns and created unease among its neighbours about China's growing influence in the region and the potential security implications of these projects.
- Myanmar is building a **military installation on Coco Islands a**nd there is a proposal for the **establishment of a remote satellite receiving ground station in Sri Lan**ka, **both with the assistance of China.**
- This has prompted apprehension in India about potential surveillance throughout the area.

**Details**

- These projects are **seen as part of China's Belt and Road Initiative**, which aims to build infrastructure across Asia and beyond to enhance China's economic and strategic interests.
- One of the most **controversial projects is the Kyaukpyu deep-sea port in Rakhine state**, which is strategically located near the Bay of Bengal and the Indian Ocean.
- Many have raised concerns about the project's potential military uses and the fact that it could give China a strategic foothold in the region.
- Recent satellite images show the **construction of a military facility on Coco Islands, located very close to the Andaman and Nicobar island chain.**
- The island is being connected to the southern landmass using a new bridge that is 175 m in length and approximately 8 m wide.
- China has also proposed setting up a remote satellite receiving ground station system in Sri Lanka in collaboration.
- **Satellite tracking facilities are inherently dual use in nature**, and the Chinese civil space programme is known to work closely with the Chinese military.

**Coco Islands**

- Coco Islands are a small group of Islands located In the North-Eastern part of Bay Of Bengal. It Is Situated 30 Miles North to the Andaman and Nicobar Islands Group Of India, to 250 Km South of the Burmese Mainland and 1255 Km South-East of Kolkata.
- North of this Island Group lies Preparis Island also belonging to Myanmar, and to the South lies the land for Island belonging to India.
- Coco Island Group consists of four islands on the Great Coco Reef and another Rai Coco Island on the Little Coco Reef.
- Coco Channel separates India's Andman Islands and Coco Islands of Myanmar.

**SUDAN CRISIS**
**Concept :**

- Fighting broke out between the **Sudanese army and the country's main paramilitary group on April 15,2023.**
- **Paramilitary forces** claim to have taken control of the **international airport in Khartoum** as well as a second airport in Meroe.
- The paramilitary Rapid Support Forces also claimed to have taken over the **Presidential Palace and Army Chief General Burhan's residence.**
- Many videos appeared on social media showing armed fighters driving across the runway of the city's international airport, conducting checkpoints at crucial traffic intersections, and moving through residential areas.
- **Note :** The Indian Embassy in Khartoum, the capital of Sudan, asked all nationals to stay indoors and take utmost precautions as gunshots and explosions rang out in various parts of the city following clashes between the army and the paramilitary forces.



**POLAND AND UKRAINE BAN WHEAT IMPORT FROM UKRAINE**
**Context:**

- Poland and Hungary have decided to ban imports of grain and other food from neighbouring Ukraine.

**More about the news:**

- **Poland and Hungary** have imposed a ban on **food grain from Ukraine until 30 June** including a **prohibition on imports of sugar, eggs, meat, milk and other dairy products and fruits and vegetables.**
- The bans are a **result of the Russia-Ukraine war**.
- Fearing the worst consequences, the **European Union then lifted duties on grain from Ukraine** to ease distribution to those global markets. However, instead of the grain transiting seamlessly onto global markets, it has remained in Poland and caused a **grain glut.**
- This **grain glut has brought down the prices drastically**, causing **massive losses to the Polish farming community.**
- The **European Union** has **criticized bans by Poland and Hungary** on imports of Ukrainian grain and other foods over the weekend, saying the unilateral moves were **"unacceptable."**

**More about European Union:**

- The European Union is a **group of 27 countries** that operate as a **cohesive economic and political block.**
- It was **formed in 1993** after the **signing of the Maastricht Treaty**
- The European Union **Headquarters is located in Brussels,** Belgium
- The Maastricht Treaty is also known as the **Treaty of the European Union.** The Maastricht Treaty was **amended thrice**. The amendments are listed below.

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- **Treaty of Amsterdam (1997)**
- **Treaty of Nice (2001)**
- **Treaty of Lisbon (2007)**
- The **objectives** of forming the European Union are listed below.
  - To **increase political cooperation**
  - To **enhance economic integration** by creating a **single currency, the EURO.**
  - **Unified security and foreign policy**
  - **Common citizenship** Rights
  - Enhanced **cooperation in the areas of judiciary, immigration and asylum**

## INDIA TO HOST TWO-DAY INTERNATIONAL BUDDHIST CONFERENCE
**Concept :**

- The **first Global Buddhist summit** is going to be **held in Delhi**. Buddhist monks and others from 30 countries are expected to attend the event.

**Key-highlights of the Summit**

- The **summit is being organized in conjunction with the International Buddhist Conference**, a non-governmental organization.
- The **International Buddhist Confederation (IBC),** an umbrella group that serves as a platform for Buddhists worldwide, is organising the event.
- Theme: '**Responses to contemporary challenges, philosophy to practice**'.
- Recently, India, which is the chair of the Shanghai Cooperation Organisation (SCO) grouping, organised a meet on Buddhist heritage involving all the countries.

**Vesak / Buddha Purnima**

- Vesak is the most sacred day for Buddhists around the world.
- It is also known as **Buddha Purnima and Buddha Day.**
- **The day commemorates birth, enlightenment and Death** (or Parinirvana) of Lord Buddha, the founder of Buddhism, all of which is said to take have taken place on the same day.
- Vesak, falls on the full moon day (Purnima) of the month Vaishakha (May), hence the occasion is referred to as Buddha Purnima in India.
- **Recognition by United Nations (UN):** The General Assembly, by its resolution in 1999, recognized internationally the Day of Vesak. It was done to acknowledge the contribution that Buddhism made to humanity.

## 20. Taiwan Strait

**Concept :**

- A U.S. warship sailed through the waters separating Taiwan and mainland China, days after Beijing staged war games around the island.
- Western Navies regularly conduct "freedom of navigation operations" to assert the international status of regional waterways such as the Taiwan Strait and the South China Sea.

**About Taiwan Strait**

- The Taiwan Strait is a 180-kilometer (110 mi)-wide **strait separating the island of Taiwan and continental Asia.**
- The **strait is part of the South China Sea** and **connects to the East China Sea to** the
- Former names of the Taiwan Strait include the **Formosa Strait or Strait of Formosa**, from a dated name for Taiwan; **the Strait of Fokien or Fujian**, from the Chinese province forming the strait's western shore; and the **Black Ditch, a calque of the strait's name in Hokkien and Hakka.**

**Geographical Features**

- The entire strait is **on Asia's continental shelf**.
- The **Taiwan Strait is relatively shallow**. It has an average depth of about 490ft.

**Rivers draining into it**

- Several rivers including the **Jiulong and Min rivers from China's Fujian Province** drain into the **Taiwan Strait**.

**Islands on the Taiwan Strait**

- Several islands are located in the strait. **Kinmen and Matsu** are two of the largest and most significant islands in the strait located off the **Fujian coast of China.**
- The biggest islands along the Taiwan side **include Penghu (or Pescadores), Xiamen, and Pingtan.**

- The **Xiamen and Pingtan Islands are administered by the People's Republic of China**, while the other three islands: **Penghu (or Pescadores), Kinmen, and Matsu are under the administration of the Republic of China (Taiwan).**
- The **Penghu (or Pescadores) Island is the largest and most populous island in the Taiwan Strait.**





**21. Top govt. panel takes stock of modification of Indus Treaty**

**Context**: A top government panel on Monday took stock of the on going modification process of the Indus Waters Treaty (IWT) between India and Pakistan.

Matters related to the ongoing Neutral Expert proceedings pertaining to the **Kishenganga** and **Rattle Hydroelectric Projects** were also discussed

**Concept:**

**Indus Water Treaty (IWT)**

- The Treaty is a **water-distribution treaty between India and Pakistan**, **brokered by the World Bank.**
- IWT was signed by the then Prime Minister Jawaharlal Nehru and then Pakistani President Mohammed Ayub Khan in Karachi on September 19, 1960, after nine years of negotiations between the two countries.
- According to this treaty, **three rivers: Ravi, Sutlej and Beas were given to India and the other three: Sindh, Jhelum and Chenab were given to Pakistan.**

**Rights & obligations under this treaty**

- India is under obligation to let the waters of the western rivers flow, except for certain consumptive use.
- The treaty allocates Pakistan approx. 80% of the entire water of the six-river Indus system and reserved for India just remaining 19.48% of the total waters.
- India can construct storage facilities on western rivers of up to 3.6-million-acre feet, which it has not done so far.
- The IWT permits run of the river projects and require India to provide Pakistan with prior notification, including design information, of any new project.

**Dispute redressal mechanism under the Treaty**

- Article IX of the Treaty is a dispute resolution mechanism – graded at three levels to resolve a difference or a dispute related to projects on the Indus waters.

**First level**

- Either party has to inform the other side if they are planning projects on the Indus river with all the information that is required or asked for by the other party.
- This process is done at the level of the Permanent Indus Commission (PIC), created to implement and manage the goals of the IWT.
- If PIC is unable to solve the question in contention, the question becomes difference and goes to second level.

**Second level**

- The second grade is the World Bank appointing a neutral expert to resolve the differences.
- If a neutral expert cannot resolve the issue, the difference becomes a dispute and goes to third level.

**Third level**

- At this level, the matter goes to a Court of Arbitration (CoA) whose chair is appointed by the World Bank.

**Why is this notice significant?**

- This notice **opens the possibility of India proposing major changes to the treaty** and even the idea of altering it completely.
- India has not spelled out exactly what it wants to be modified in the Treaty.



Kishanganga Hydropower Project on a tributary of the Jhelum in Bandipora district of J&K. *Archive*

**INDUS RIVERS TREATY**

**EASTERN RIVERS**
Sutlej, Beas, Ravi
**11 cubic km** annual flow before entering Pakistan. India has full rights on all waters; Pak can use whatever flows into its territory

**WESTERN RIVERS**
Indus, Jhelum, Chenab
**232.5 cubic km** annual flow before entering Pak; India can use only about 62.2 cubic km, 170.3 cubic km reserved for Pak

*Source: India Water Resources Information System*

- Under the treaty signed between India and Pakistan in 1960, all the waters of the three eastern rivers, averaging around 33 million acre-feet (MAF), were allocated to India for exclusive use.

- The waters of the western rivers – Indus, Jhelum, and Chenab – averaging to around 135 MAF, were allocated to Pakistan except for 'specified domestic, non-consumptive and agricultural use permitted to India,' according to the treaty.
- **India has also been given the right to generate hydroelectricity through the run of the river (RoR) projects on the western rivers which, subject to specific criteria for design and operation, is unrestricted.**

## 22. U.S. AVIATION WATCHDOG RETAINS INDIA'S SAFETY CATEGORY AFTER REVIEW
**Concept :**

- The **Federal Aviation Administration**, which is the aviation safety regulator of the U.S., has retained the "**Category 1" status for India's aviation safety oversight.**

**International Aviation Safety Assessment (IASA) programme**

- The **International Aviation Safety Assessment (IASA) programme** of the Federal Aviation Administration checks if a country's oversight of its airlines that operate or wish to operate to the U.S. or enter into codeshare partnerships with the U.S. complies with the safety **standards established by the International Civil Aviation Organization (ICAO)**, which is a specialised agency of the UN.
- The IASA programme focuses **mainly on three broad areas namely personnel licensing, operation of aircraft and airworthiness of aircraft**.
- According to the Federal Aviation Administration, the **Directorate General of Civil Aviation (DGCA) has met the international standards** for aviation safety **oversight of the Chicago Convention.**

**Chicago Convention**

- The **Chicago Convention established the core principles** permitting **international transport by air, and also led to the creation of the ICAO.**
- ICAO was created in **1944 by the Chicago Convention** in order to promote the safe and orderly development of civil aviation around the world.

**Universal Safety Oversight Audit Programme Continuous Monitoring Approach**

- The International Civil Aviation Organisation (ICAO) Universal Safety Oversight Audit Programme (USOAP) was established in 1999.
- It aims to promote global aviation safety.
- It is **done through regular audits of ICAO Member States to** determine their ability to maintain their safety oversight systems.
- This **enables the State to ensure the implementation of ICAO's safety-related Standards and Recommended Practices (SARPs**) and associated procedures and guidance material.
- In addition, it provides ICAO with a means to continuously monitor the States' fulfillment of their safety oversight obligations.
- The programme is managed by the Monitoring and Oversight office within the Air Navigation Bureau.

## 23.TEJAS, SUKHOI JETS PARTICIPATE IN COPE EXERCISE
**Defence**
**Concept :**

- The Indian Air Force (IAF) fighters, including Tejas **Light Combat Aircraft (LCA), Rafale, SU-30MKI, and Jaguars,** are set to participate in bilateral air **Exercise Cope India 23** with US Air Force (USAF) F-15 fighters and B-1B long-range bombers.

**Background**

- Cope India began in 2004 as a **fighter training exercise held at Air Station Gwalior, India.**
- The exercise has evolved to incorporate subject matter expert exchanges, air mobility training, airdrop training and large-force exercises, in addition to fighter-training exercises.
- The **exercise showcases U.S. and India's efforts and commitment to a free and open Indo-Pacific region.**

**About the exercise**

- It is a **bilateral exercise between the air forces of the two countries**.
- The exercise comes amid India's continuing three-year-long military confrontation with China in eastern Ladakh as well as the ongoing Russia-Ukraine war, which has seen Beijing and Moscow get into a tighter strategic clinch.

**Highlights of the 2023 version**

- The exercise will be **conducted in two phases**, with the **first phase practicing the air-mobility component involving transport aircraft of both countries**.

- The IAF element will include the Su-30MKI, Rafale, Tejas, and Jaguar fighter aircraft, while Japan is taking part in the exercise as an observer.
- The second phase of the exercise will witness the participation of B-1B bombers of USAF, and F-15 fighter aircraft of the USAF will join the exercise subsequently, according to an IAF statement.

The **exercise will be supported by aerial refuellers, Airborne Warning and Control System, and Airborne Early Warning and Control aircraft of the IAF.**

## 24. WTO PANEL

**Context:** A World Trade Organization (WTO) panel said on Monday that India had violated global trading rules in a dispute with the European Union (EU), Japan and Taiwan over import duties on IT products

**What is the dispute?**

- In 2019, the EU challenged India's introduction of import duties of between 7.5% and 20% for a wide range of IT products, such as mobile phones and components, as well as integrated circuits, saying they exceeded the maximum rate. Japan and Taiwan filed similar complaints that same year.
- The EU is India's third largest trading partner, accounting for 10.8% of total Indian trade in 2021, according to the European Commission.
- India's diplomatic mission in Geneva did not immediately respond to a request for comment on whether it would appeal against the ruling. If it does, the case will sit in legal purgatory since the WTO's top appeals bench is no longer functioning due to U.S. opposition to judge appointments.
- The WTO panel said that India had already brought some of the challenged tariffs into line with global trading rules since last year. While the panel broadly backed the complaints against India, it rejected one of Japan's claims that New Delhi's customs notification lacked "predictability".

## 25. World Food Program in Sudan

**Context**: Three employees for the World Food Programme (WFP), a UN body that delivers food assistance to vulnerable communities, were killed after the RSF and armed forces exchanged fire at a military base in Kabkabiya, in the west of the country.

**What is happening in Sudan?**

**The fighting that has erupted in the Sudanese capital, Khartoum, and elsewhere in the country is a direct result of a vicious power struggle within the country's military leadership.**

The clashes are between the regular army and a paramilitary force called the Rapid Support Forces (RSF).

**Where is Sudan?**

- Sudan is in north-east Africa and is one of the largest countries on the continent, covering 1.9 million square kilometres.
- It is also one the poorest countries in the world, with its 46 million people living on an **average annual income of $750 (£606) a head**.
- The population of Sudan is predominantly Muslim and the country's official languages are Arabic and English



**Who is fighting who in Sudan?**

Since the **2021 coup**, Sudan has been run by a council of generals, led by the two military men at the centre of this dispute:

- **Gen Abdel Fattah al-Burhan**, the head of the armed forces and in effect the country's president
- And his deputy and leader of the RSF, **Gen Mohamed Hamdan Dagalo**, better known as Hemedti.

## World Food Programme

- The World Food Programme is the world's largest humanitarian organization, saving lives in emergencies and using food assistance to build a pathway to peace, stability and prosperity for people recovering from conflict, disasters and the impact of climate change.
- As the international community has committed to end hunger, achieve food security and improved nutrition by 2030, one in nine people worldwide still do not have enough to eat.
- It was founded in 1961 by the Food and Agriculture Organization (FAO) and United Nations General Assembly (UNGA) with its headquarters in Rome, Italy.
- It is also a member of the United Nations Sustainable Development Group (UNSDG), a coalition of UN agencies and organizations aimed at fulfilling the Sustainable Development Goals (SDGs).
- The WFP assists 88 countries, and has assisted 97 million people (in 2019) which is the largest number since 2012.
- It works closely with the other two Rome-based UN agencies:
    - The Food and Agriculture Organization (FAO), which helps countries draw up policy and change legislation to support sustainable agriculture
    - The International Fund for Agricultural Development (IFAD), which finances projects in poor rural areas.
- The WFP has no independent source of funds, it is funded entirely by voluntary donations. Its principal donors are governments, but the organization also receives donations from the private sector and individuals.
- The WFP has been awarded with the Nobel Prize for Peace 2020 for its efforts to combat hunger, bettering conditions for peace in conflict-affected areas and preventing the use of hunger as a weapon of war and conflict.

## Report Released by WFP

- **Global Report on Food Crisis**– The Global Report on Food Crises describes the scale of acute hunger in the world. It provides an analysis of the drivers that are contributing to food crises across the globe.
    - The report is produced by the Global Network against Food Crises, an international alliance working to address the root causes of extreme hunger.

## 26. India to appeal WTO panel ruling on ICT import tariffs

### Context:

- India is **expected to appeal** a recent ruling by a **panel of the World Trade Organization (WTO)** on its imposition of tariffs on mobile phones and electronic components.

### More about the news:

- The **dispute settlement** panel of the **World Trade Organization (WTO)** had ruled that **India had violated global trading** rules in a dispute with the European Union (EU), Japan and Taiwan over import duties on IT products.
- The **EU, Chinese Taipei (Taiwan) and Japan** dragged India to the WTO dispute in 2019 on imposing tariffs on certain information and communications technology goods.
- These products include mobile phones, microphones, transmission apparatus for radio broadcasting etc.
- As per these petitions, **India is signatory to the 1996 Information Technology Agreement (ITA).**
- Hence, it is required to **eliminate tariffs on a range of products, including mobile handsets.**
- Many countries had complained that the imposition of tariffs on IT products by India was against the **principles** agreed upon under ITA.

### What options does India have after the present WTO ruling.

- India has the **option to appeal** against the present ruling.
- **If India does so**, the **case will sit in legal purgatory** since the **WTO's top appeals bench is no longer functioning** due to **U.S. opposition to judge appointments**.
- Legal purgatory is a term used to **describe a situation where a legal case or dispute is in a state of limbo,** without resolution or a clear path forward.

### What is Dispute Settlement Body of WTO:

- The General Council convenes as the **Dispute Settlement Body (DSB)** to deal with disputes between WTO members.
- The DSB has **authority** to:
    - Establish dispute settlement panels,
    - Refer matters to arbitration, adopt panel, Appellate Body
    - Maintain surveillance over the implementation of recommendations and rulings contained in arbitration reports, and
    - Authorize suspension of concessions in the event of non-compliance with those recommendations and rulings.

## 27. Latest developments in Yemen

**Concept :**

- Hundreds of prisoners captured during the war in Yemen were reunited with their families amid diplomatic efforts to halt the conflict.
- The main warring sides in Yemen are the Iran-backed Houthis and the pro-Yemen government, Saudi-led coalition.
- The two opposing sides had agreed to release 887 detainees.
- The large-scale prisoner swap has given the people hope for a permanent ceasefire in Yemen.

**Stockholm Agreement**

- The warring parties had signed the Stockholm Agreement in December 2018.
- As per the agreement they had committed to freeing conflict-related detainees
- The agreement brokered by the United Nations had three main components:
- **Hudayah agreement**
- The Hudayah agreement included a ceasefire in the city of Hodeidah and other clauses like no military reinforcements in the city and strengthened UN presence.
- **Prisoner exchange agreement**
- **Taïz agreement**
- The Taïz agreement includes the formation of a joint committee with participation from civil society and the UN.

**How did the war in Yemen begin?**

- The conflict in Yemen began in 2011 as part of the Arab Spring protests.
- The **Houthis, backed by Iran**, took advantage and **captured the Saada province in the north, and then Sana'a, the capital of Yemen, in 2014.**
- The thought of Iran-backed Houthis in control of Yemen bothered Saudi Arabia due to its differences with Iran.
- Saudi Arabia then led a coalition that included other Arab countries and sent troops to Yemen in 2015.
- However, they were unable to oust Houthis from Sana'a as well as from the north of the country.
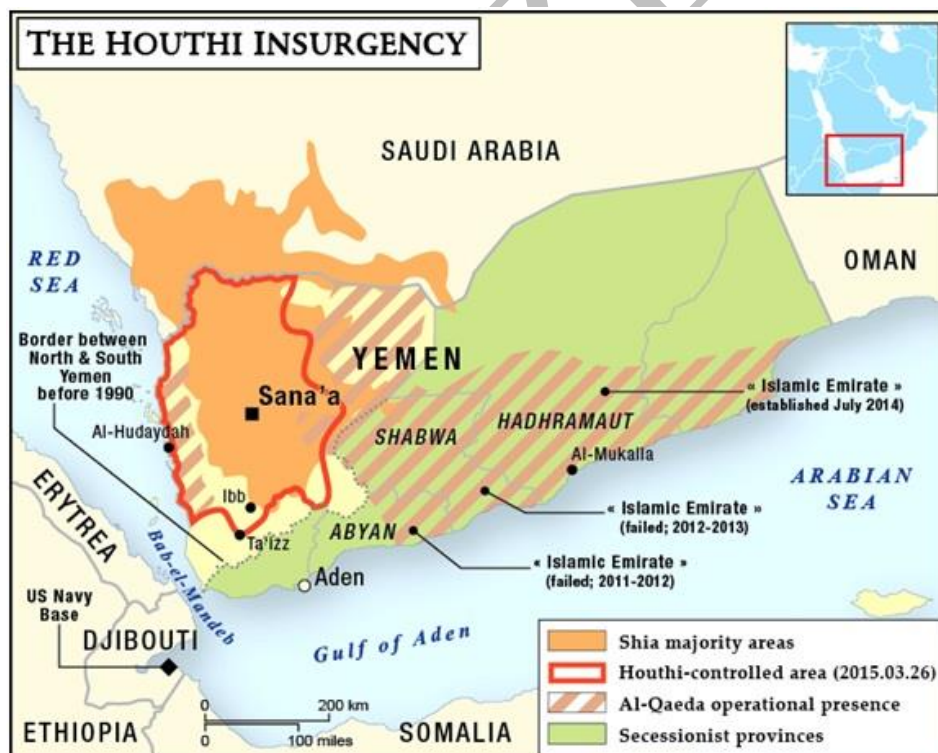


**How has this affected Yemen?**

- According to the UN, Yemen is now the largest humanitarian crisis in the world with 80% of its population dependent on aid and protection.
- Over three million people have been displaced from their homes since 2015, and public service sectors like healthcare, water, sanitation, and education have either collapsed or are in a dire situation.
- It has lost $90 billion in economic output and more than 6,00,000 people have lost their jobs.
- More than half of the country's population is living in extreme poverty.

**28. Kyiv receives Patriot Missiles from US**

**Concept :**

- American-made Patriot missiles have arrived in Ukraine, the country's defense minister said Wednesday, providing Kyiv with a long-sought new shield against the Russian airstrikes that have devastated cities and civilian infrastructure.

**About Patriot system:**

- The Patriot is **one of the most sought-after defence systems and has been deployed in 18 countries, including the U.S.**
- The Patriot is a **surface-to-air guided missile system that was first deployed in the 1980s.**
- **History:**
    - Initially developed as a system to intercept high-flying aircraft by Raytheon Technologies, the Patriot was modified in the 1980s to focus on other threats such as ballistic missiles.
    - The programme's roots can be traced back to the 1960s when the Pentagon was looking to replace the HAWK and Nike-Hercules air defence systems.
- Currently, **Patriot batteries can defend against ballistic missiles, cruise missiles, drones, jets and "other threats", but it doesn't offer protection against low-flying small drones.**
- A mobile Patriot system includes a control centre, a radar station to detect threats, missile launchers to take out those threats and other support vehicles.
- It **can launch different types of interceptor missiles**: The older PAC-1 and PAC-2 interceptors used a blast-fragmentation warhead, while the newer PAC-3 missile has a more advanced hit-to-kill technology.
- The **Patriot system's radar has a range of over 150 km and it can track over 50 potential targets at the same time.**

**29. HakkiPikkis caught in Sudan conflict**

**Context**:

- More than 181 members of the H**akkiPikki tribal community from Karnataka** are stuck in violence-hit Sudan,

**Who are the HakkiPikki:**

- The HakkiPikki is a tribe that lives in **several states in west and south India,** especially near forest areas.
- HakkiPikkis (**Hakki in Kannada means 'bird' and Pikki means 'catchers'**) are a **semi-nomadic tribe,** traditionally of bird catchers and hunters.
- According to the 2011 census, the **HakkiPikki population in Karnataka is 11,892.**
- They **live majorly in Davangere, Mysuru, Kolar, Hassan and Shivmogga districts.**
- In different regions, they are known by different names, such as **Mel-Shikari in northern Karnataka and Maharashtra.**
- The HakkiPikki **move in groups from place to place** in search of livelihood.
- They are **divided** into **four clans, called Gujaratia, Panwar, Kaliwala and Mewaras.**
- These clans can be **equated with castes in the traditional Hindu society.**
- In the **olden days,** there was a **hierarchy among the clans**, with the **Gujaratia at the top** and the **Mewaras at the bottom.**
- Despite being surrounded by Dravidian languages and living in southern India, the **community speaks an Indo-Aryan language.**
- Their **mother tongue** was designated **'Vaagri'** by scholars. They communicate in 'Vaagri' at home **but speak in Kannada when conducting daily business.**
- **UNESCO has listed 'Vaagri'** as one of the **endangered languages.**

**What were their traditional jobs, and what do they do now:**

- Traditionally, **HakkiPikkis lived in forest areas**, leading a **nomadic life for nine months** a year and coming back to their **permanent camps for three.**
- Earlier, **men of the tribe would hunt while women begged** in villages. But as the wildlife protection laws became stricter, the HakkiPikkis in Karnataka **started selling spices, herbal oils, and plastic flowers in local temple fairs.**
- Later, they started **selling their products in Africa.**
- **Education levels** among the HakkiPikkis are **still low.**

**What are their rituals and customs:**

- HakkiPikkis in **Karnataka follow Hindu traditions** and celebrate all Hindu festivals.
- They are **non-vegetarian**s. The **eldest son** in a family is **not supposed to cut his hair** so that he can be identified easily.
- The tribe **prefers cross-cousin marriages**. According to locals, the usual age of marriage is 18 for women and 22 for men.
- The **society is matriarchal**, where the **groom gives dowry to the bride's family.**

## 30. C+C5 groups

**Context:**

- This week, China convened an **online meeting** of trade ministers of the grouping known as **C+C5 '**

**What is C+C5 groupings:**

- It is a group comprising **China and the five Central Asian republics, namely Uzbekistan, Kazakhstan, Tajikistan, Turkmenistan, and Kyrgyzstan.**
- The **first C+C5 summit** was held in **virtual format on January 25 last year**, to commemorate the **30th anniversary of diplomatic relations.**
- **Diplomatic relations** between China and Central Asian Countries were established in **January 1992**, and China's relationship with the region was institutionalized as the **Shanghai Five,** the **forerunner of the Shanghai Cooperation Organisation** (SCO).

## 31. Critical Minerals

**Concept :**

- A recent working paper from Centre for Social and Economic Progress (CSEP) extends the earlier minerals assessment for 23 minerals by assessing the criticality levels of 43 select minerals for India based on their economic importance (demand-side factors) and supply risks (supply-side factors) which are determined through the evaluation of specific indicators.

**Critical minerals**

- **Critical minerals** refer to mineral resources, **both primary and processed, which are essential inputs in the production process of an economy**, and **whose supplies are likely to be disrupted due to the risks of non-availability or unaffordable price spikes**.
- To tackle such supply risks, major global economies periodically evaluate which minerals are critical for their jurisdiction through a quantitative assessment.

**Examples:**

- Minerals such as **antimony, cobalt, gallium, graphite, lithium, nickel, niobium, and strontium are among the 22 assessed to be critical for India**.

**Significance for India:**

- Many of these are required to meet the manufacturing needs of green technologies, high-tech equipment, aviation, and national defence.
- However, while India has a significant mineral geological potential, many minerals are not readily available domestically.
- Hence, India needs to develop a national strategy to ensure resilient critical minerals supply chains, which focuses on minerals found to be critical.

**Applications:**

- **Electric vehicles**: cobalt, lanthanum, lithium
- **Fuel cells**: platinum, palladium, rhodium
- **Wind energy technologies**: neodymium, dysprosium, terbium
- **Aviation sector**: titanium
- **Photovoltaic solar technologies**: cadmium, indium, gallium

**Categorization:**

- **Traditional** — titanium, vanadium
- **Sunrise —** lithium
- **Mixed use** — cobalt, nickel, graphite, light rare earth elements (LREEs), heavy rare earth elements (HREEs).

**Minerals Security Partnership (MSP)**

- In 2022, the **US and 10 other nations** — Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea (South Korea), Sweden, the United Kingdom, and the European Commission — came together in a bid to **break China's dominance in the global marketof rare earth minerals** and formed the **Minerals Security Partnership (MSP).**
- **Objective:**
  - The **goal of the MSP** is to ensure that critical minerals are produced, processed, and recycled in a manner that supports the ability of countries to realize the full economic development benefit of their geological endowments.
  - Focus would be on the supply chains of minerals such as **Cobalt, Nickel, Lithium** and also the **17 "rare earth" minerals.**

**G7's Sustainable Critical Minerals Alliance**

Canada, along with Australia, France, Germany, Japan, the United Kingdom and the United States, launched the Sustainable Critical Minerals Alliance to drive the global uptake of environmentally sustainable and socially inclusive and responsible mining, processing and recycling practices and responsible critical minerals supply chains.

## 32. Beijing Accord

**Concept :**

- Iran and Saudi Arabia, who have been in conflict directly and indirectly since the rise of the Arab Spring in 2011 have agreed to resume diplomatic relations and reopen embassies within two months.
- The agreement came after Chinese-brokered talks in Beijing.

**More Details**

- On March 10, 2023, **Iran, Saudi Arabia and China announced an agreement had been reached covering a resumption of diplomatic relations between the Kingdom of Saudi Arabia and the Islamic Republic of Iran.**
- The **three countries also announced a re-opening of their embassies** and missions within a period not exceeding two months.
- The announcement was significant and surprised the US and Israel who had been attempting to build a regional coalition against Iran.
- The agreement affirmed their respect for the sovereignty of states and non-interference in the internal affairs of states.
- The deal, brokered by China, also **included the implementation of a security cooperation agreement signed in 2001 and a 1998 pact to enhance cooperation on trade, investment, technology, and culture.**

## 33. Faith in children's vaccines has gone up in India, says UNICEF

**Concept :**

- According to the data collected by **The Vaccine Confidence Project and published by UNICEF**, **out of the 55 countries studied, only China, India, and Mexico showed improvement in the popular perception of the importance of vaccines for children.**
- As per the data, vaccine confidence has been on a decline in countries such as Japan, the Republic of Korea, Papua New Guinea, Ghana, and Senegal.
- The report also noted that the growing threat of vaccine hesitancy was mainly due to factors such as misleading information and declining trust in vaccine efficacy.
- Further, **UNICEF India has released its global flagship report titled "The State of the World's Children 2023: For Every Child, Vaccination"** which underlines the importance of childhood immunisation.
- The report pointed out that about 67 million children missed out on vaccinations between 2019 and 2021 and the vaccination coverage levels decreased in 112 countries.
- The decline in vaccine coverage has been mainly attributed to intense demands on health systems, the diversion of immunisation resources to COVID-19 vaccination, health worker shortages and stay-at-home measures.

**About UNICEF**

- UNICEF is a **special program of the United Nations (UN)** devoted to aiding national efforts to improve the health, nutrition, education, and general welfare of children.
- UNICEF was created in 1946 as International Children's Emergency Fund (ICEF) by UN relief Rehabilitation Administration to help children affected by World War II.
- UNICEF became a **permanent part of the United Nations in 1953**.
- The name was shortened to United Nations Children Fund but it is still referred to as UNICEF.
- It is **mandated by the United Nations General Assembly** to advocate for the protection of children's rights, to help meet their basic needs and to expand their opportunities to reach their full potential.
- UNICEF is **guided by the Convention on the Rights of the Child, 1989.**
- It strives to establish children's rights as enduring ethical principles and international standards of behaviour towards children.
- Awarded the Nobel Prize for Peace in 1965 for "promotion of brotherhood among the nations".
- **Headquarters: New York City**
- It works in over 190 countries and territories with 7 regional offices.
- **UNICEF is governed by an Executive Board consisting of 36 members that are elected to terms of three years by the United Nations' Economic and Social Council.**

## 34. India lines up evacuation in Sudan

**Concept :**

- India began preparations for the evacuation of an estimated 3,000 Indian nationals presently situated in different parts of Sudan which has seen intense fighting between the army and a paramilitary force for a week now.

**More Details**

- In Sudan, powerful rival military factions are battling for control.
- The fight is between the army and the powerful paramilitary group, the Rapid Support Forces (RSF).
- Both groups were allies. Together, they seized power in a 2021 coup.
- But tensions increased over the proposed integration of the RSFinto the military.
- The key question is who is in control and who would be the military's commander-in-chief during an integration period.
- **Main players on the ground:** Since the 2021 coup, Sudan has been run by a council of generals, led by the two military men at the centre of this dispute:
- Gen Abdel Fattah al-Burhan, the head of the armed forces and in effect the country's president
- And his deputy and leader of the RSF, Gen Mohamed Hamdan Dagalo, better known as Hemedti.
- They have disagreed on the direction the country is going in and the proposed move towards civilian rule.
- The main sticking points are plans to include the 100,000-strong RSF into the army, and who would then lead the new force.

**Rapid Support Forces**

- The RSF was formed in 2013 and has its origins in the notorious Janjaweed militia that brutally fought rebels in Darfur, where they were accused of ethnic cleansing.
- Since then, Gen Dagalo has built a powerful force that has intervened in conflicts in Yemen and Libya. He has also developed economic interests including controlling some of Sudan's gold mines.
- The RSF has been accused of human rights abuses, including the massacre of more than 120 protesters in June 2019.
- Such a strong force outside the army has been seen as a source of instability in the country.

**About Sudan**



- Sudan is in **north-east Africa** and is **one of the largest countries on the continent**, covering 1.9 million square kilometres.
- It is also one the poorest countries in the world, with its 46 million people living on an average annual income of $750 (£606) a head.
- The population of Sudan is **predominantly Muslim and the country's official languages are Arabic and English.**
- Sudan **borders the Red Sea, the Sahel region and the Horn of Africa.**
- Its strategic location and agricultural wealth have attracted regional power plays, complicating the chances of a successful transition.

**35. Nagorno-Karabakh Enclave**

**Concept :**

- **Azerbaijan said it set up a checkpoint on the Lachin corridor**, the **only land link between Armenia and the the disputed Nagorno-Karabakh enclave**.

**Nagorno-Karabakh Region**

- Nagorno-Karabakh is a **mountainous and heavily forested region that under international law is recognised as part of Azerbaijan.**
- However, **ethnic Armenians who constitute the vast majority of the population** there reject Azeri rule (the legal system of Azerbaijan).
- After Azerbaijan's troops were pushed out of the region following a war in the 1990s, these **ethnic Armenians have been in administrative control of Nagorno-Karabakh**, with **support from Armenia**.
- **Strategic Significance**:

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- The energy-rich Azerbaijan has built several gas and oil pipelines across the Caucasus (the region between the Black Sea and the Caspian Sea) to Turkey and Europe.
- Some of these pipelines pass close to the conflict zone (within 16 km of the border).
- In an open war between the two countries, the pipelines could be targeted, which would impact energy supplies and may even lead to higher oil prices globally.



## 36. Wagner group actions in Africa

**Concept :**

- In the wake of the **political crisis in Sudan** which recently has turned into a countrywide armed conflict, there have been **questions raised over the involvement of the Wagner group.**

**Wagner Group**

- The Wagner group is a **Russian private paramilitary organisation** which is led by Yevgeny Prigozhin, a rich businessman who is famously known as "**Putin's chef".**
- The **Wagner Group is known to have very close ties with Russian President Vladimir Putin.**
- **The first operation of the Group was helping Russia annex Crimea in 2014** and since then the Wagner Group has been used in various Russian military operations in many countries.
- Although the Wagner group works closely with the Russian security apparatus, **it is legally not recognised as a Russia-based private military company as private mercenary groups are illegal in Russia.**
- However, in 2018, the Russian President **recognised the group saying that the group has the right to pursue its interests anywhere in the world as long as they do not break Russian law.**
- Apart from engaging in counter-militancy operations in Africa, the group is also involved in various political, economic and military fields.
- The group has been **active in countries like Sudan, Mali, the Central African Republic, Mozambique and Libya in Africa.**

**Note :**

- **The UN's International Convention against the Recruitment, Use, Financing and Training of Mercenaries** states that the **states are required to bear the responsibility for the activities of the mercenaries** who violate principles of international law which threaten sovereign equality, political independence, territorial integrity of states and self-determination of people.
- However, the **Wagner Group is not a Russia-based private military company legally**.

Military and political engagement | Economic and political

**1** 2014, Ukraine: Lieutenant colonel **Dmitry Utkin** and his mercenary squad take part in the annexation of Crimea. The group is named after Utkin's call sign, **Wagner**

2015: **Yevgeny Prigozhin** (right) – close ally of President **Vladimir Putin** – becomes Wagner's patron

**Jan 2023:** Paris agrees to pull its troops out of Burkina Faso following demand from Russian-backed anti-French junta

**2** 2015-18, Syria: Wagner supports Russian military. 100 Wagner members killed in U.S. air strike

**3** 2016-20, Libya: 1,000 Wagner fighters estimated to have fought alongside General Khalifa Haftar

**4** 2017-2019, Sudan: Group fights on side of dictator Omar Bashir

**5** 2017, CAR: Wagner involved in training troops and control of diamond mines

**6** 2019, Mozambique: Group fights jihadists in north. Leaves after seven Wagner deaths

**7** 2021, Mali: Wagner Group deployed to provide security against Islamic militants. Move precedes French military withdrawal in 2022. EU accuses Wagner Group of extrajudicial killings in Mali

## 37. Operation Kaveri

**Concept :**

- India has initiated an operation to evacuate its nationals from conflict-hit Sudan.
- **Operation Kaveri**
- As per reports, close to 3,000 Indians are stuck in various parts of Sudan such as the national capital, Khartoum and other provinces like Darfur.
- **Operation Kaveri has been initiated to bring back such stranded Indian citizens from Sudan**.
- Stranded Indian citizens are **being evacuated from Port Sudan**.
- India has deployed two C-130J heavy-lift aircraft in Jeddah (Saudi Arabia) and has sent INS Sumedha to Port Said (Egypt) for the operation.

**Major evacuation operations**

- **Operation Ganga**: In a mission to evacuate stranded Indians from war-torn Ukraine, the Indian government kicked off Operation Ganga in February 2022
- **Operation Devi Shakti**: An evacuation operation by the Indian Armed Forces (IAF) was kicked off in August 2021 to safely bring back Indian nationals from Afghanistan after the collapse of the Islamic Republic of Afghanistan and the fall of Kabul, the capital city of the Taliban.
- **Vande Bharat Mission**: Special flights were operated across to globe in this mission to bring back the nationals who were left stranded in foreign countries due to the coronavirus pandemic.
- **Wuhan Airlift**: In one of the most difficult evacuation flights, India airlifted its citizens safe from China's coronavirus-hit city of Wuhan in January 2020.
- **Operation Maitri**: The government of India carried out this mission to safely bring the nationals from Nepal after the deadly earthquake in 2015.
- **Operation Raahat**: Hundreds of Indians and other nationals were rescued under this operation during the unrest at Yemen's capital Sana'a after the complete takeover by Houthi rebel fighters in January 2015
- **Operation Amnesty Airlift**: The mission was carried out in September 1996 to bring back the Indian nationals who did not have valid permits from the United Arab Emirates.

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- **Kuwait Airlift**: In one of the most massive operations in Indian history, the Indian Air Force joined hands with Air India in airlifting stranded Indian nationals in Kuwait in August 1990.

**38. India to host SCO Defence Ministers' meeting**

**Concept:**

- India will be hosting the Defence Ministers from the **Shanghai Cooperation Organisation (SCO) member countrie**s and **observer countries such as Belarus and Iran.**
- The members of SCO include **Russia, China, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Pakistan and India.**
- **India is the chairman of the SCO for 2023.**
- During the meeting, the Defence Ministers are expected to discuss issues and matters concerning regional peace and security, counter-terrorism efforts within the SCO and effective multilateralism.

**About SCO**

- The SCO is a permanent intergovernmental international organisation. It is a Eurasian political, economic, and security alliance and has been the primary security pillar of the region.
- It was **established in 2001**. It was preceded by the **Shanghai Five mechanisms.**
- The **Heads of State Council (HSC) is the supreme decision-making body in the SCO**. It meets once a year and adopts decisions and guidelines on all important matters of the organisation.
- The organisation has two permanent bodies:
- the SCO Secretariat based in Beijing.
- the Executive Committee of the Regional Anti-Terrorist Structure (RATS) based in Tashkent.
- **Eight member states**: India, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, and Uzbekistan.
- **Four observer states**: Afghanistan, Belarus, Iran and Mongolia.

**39. European countries to expand North Sea wind farms**

**Concept :**

- **Nine European countries have pledged to multiply the capacity of offshore wind farms in the North Sea by eight times current levels before 2050**, turning it into what Belgium's energy minister called "**Europe's biggest green power plant".**

**About North Sea**

- The **North Sea is a part of the Atlantic Ocean**, located **between Norway and Denmark** in the **east, Scotland and England in the west**, and **Germany, the Netherlands, Belgium and France in the south.**
- An offshoot of the North Sea is **the Strait of Skagerrak**, between Denmark, Norway, and Sweden, which connects to the Baltic Sea through the **Kattegat, Öresund, the Great Belt and the Little Belt.**
- In the south, the **North Sea connects with the rest of the Atlantic through the Strait of Dover into the English Channel** and **in the north through the Norwegian Sea.**
- Major rivers that drain into the North Sea include the **Forth (at Edinburgh), Elbe (at Cuxhaven), the Weser (at Bremerhaven), the Ems at Emden, the Rhine and Meuse (at Rotterdam), the Scheldt (at Flushing), the Thames, and the Humber (at Hull**).
- The **Kiel Canal,** one of the world's busiest artificial waterways, **connects the North Sea with the Baltic.**

**40. Nuclear liability law**

**Concept :**

- The issues regarding India's nuclear liability law continue to hold up the more than a decade-old plan to build six nuclear power reactors in Maharashtra's Jaitapur, the world's biggest nuclear power generation site under consideration at present.

**Law governing nuclear liability in India**

- **Laws on civil nuclear liability ensure that compensation is available to the victims for nuclear damage caused by a nuclear incident or disaster** and set out **who will be liable for those damages.**
- The **international nuclear liability regime consists of multiple treaties and was strengthened after the 1986 Chernobyl nuclear accident.**
- The **umbrella Convention on Supplementary Compensation** (CSC) was adopted in 1997 with the aim of establishing a minimum national compensation amount.
- **India is signatory to the CSC.**

**The Civil Liability for Nuclear Damage Act:**

- To keep in line with the international convention**, India enacted the Civil Liability for Nuclear Damage Act (CLNDA) in 2010**, to put in place a speedy compensation mechanism for victims of a nuclear accident.
- The **CLNDA provides for strict and no-fault liability on the operator of the nuclear plant, where it will be held liable for damage regardless of any fault on its part.**
- It also specifies the amount the **operator will have to shell out in case of damage caused by an accident at ₹1,500 crore and requires the operator to cover liability through insurance or other financial security**.
- In case the **damage claims exceed ₹1,500 crore, the CLNDA expects the government to step in and has limited the government liability amount to the rupee equivalent of 300 million Special Drawing Rights (SDRs) or about ₹2,100 to ₹2,300 crore**.
- The Act also specifies the limitations on the amount and time when action for compensation can be brought against the operator.

**Reactors in India:**

- India currently has 22 nuclear reactors with over a dozen more projects planned.
- All the existing reactors are operated by the state-owned Nuclear Power Corporation of India Limited (NPCIL).

**Supplier liability clause as an issue in nuclear deals**

- Foreign suppliers of nuclear equipment from countries as well as domestic suppliers have been wary of operationalising nuclear deals with India as it has the only law where suppliers can be asked to pay damages.

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- Concerns about potentially getting exposed to unlimited liability under the CLNDA and ambiguity over how much insurance to set aside in case of damage claims have been sticking points for suppliers.
- While liability for operators is capped by the CLNDA, this exposes suppliers to unlimited amounts of liability.

**Existing projects in India**

- The Jaitapur nuclear project has been stuck for more than a decade.
- Other nuclear projects, including the nuclear project proposed in Kovvada, Andhra Pradesh, have also been stalled.
- Despite signing civil nuclear deals with a number of countries, including the U.S., France and Japan, the only foreign presence in India is that of Russia in Kudankulam — which predates the nuclear liability law.

**What is the government's stand?**

- The central government has maintained that the Indian law is in consonance with the CSC.
- The **provision "permits" but "does not require" an operator to include in the contract or exercise the right to recourse.**

## 41. OECD's Automatic Exchange of Information (AEOI) framework

**Why in News?**
India wants non-financial assets included in OECD information exchange framework. At present, the OECD's AEOI framework provides for sharing of financial account details. India is pushing to widen the scope of the common reporting standard (CRS) at the G20 grouping to include non-financial assets like real estate properties under the automatic exchange of information among OECD countries.

**What is OECD's AEOI Framework**

- Provides for sharing of financial account details among signatory countries with an aim to check tax evasion.
- India currently has AEOI with 108 jurisdictions for receiving financial information and with 79 jurisdictions for sending information automatically.
- Flow of information has helped us in increasing tax collection and revenue buoyancy has increased

**Related Provisions**
OECD also approved the **Crypto-Asset Reporting Framework (CARF)** – Provides for the reporting of tax information on transactions in Crypto-Assets in a standardized manner, with a view to automatically exchanging such information.

**OECD's Tax Transparency report**

- Asian nations estimated to have lost €25 billion in revenue in 2016 due to tax evasion and illicit financial flows.
- 4 per cent of Asia's financial wealth amounting to Euro 1.2 trillion was held offshore, leading to a potential annual revenue loss of Euro 25 billion for the region in 2016.
- Slower economic growth, increased government expenditure on public health, social and economic support, and other areas make the fight against tax evasion and other illicit financial flows (IFFs) even more pressing.
- Asia accounted for 38.8 per cent of the estimated USD 7.8 trillion lost by developing countries due to IFFs between 2004-2013.
    - The **'Tax Transparency in Asia 2023' report** was launched at the meeting of the **Asia Initiative of the Global Forum on Transparency and Exchange of Information for Tax Purposes**. Currently **167 jurisdictions are members** of the Global Forum which include all G20 countries.

**About Common Reporting Standard (CRS)**

- The Common Reporting Standard (CRS) is developed in response to the **G20 request** and **approved by the OECD Council** on 15 July 2014.
- It requires jurisdictions to **obtain information** from their financial institutions and **automatically exchange** that information with other jurisdictions on an **annual basis**.
- It specifies the **financial account information** to be exchanged, the **financial institutions** required to report, the **different types of accountsand taxpayers** covered, as well as **common due diligence procedures** to be followed by financial institutions.

**About OECD**

- The Organisation for Economic Co-operation and Development (OECD) is an **international, intergovernmental economic organization of 38 countries** that works to build better policies for better lives.
- OECD was founded in the year **1961** to **stimulate world trade and economic progress headquartered at Paris, France**.
- OECD originated in 1948, as the Organisation for European Economic Co-operation (OEEC) to govern the predominantly **US-funded Marshall Plan for post-war reconstruction on the continent**.
- Most OECD members are **high-income economies** with a very **high Human Development Index (HDI)** and are regarded as developed countries. OECD members are **democratic** countries that support **free-market economies.**
- **India** is a **key partner of OECD.**

## 42. Sudan's Rapid Security Forces

### Why in News?

Sudan's military and its paramilitary forces have been involved in a fierce battle against each other since April 15, leaving at least 420 people dead and more than 3,700 wounded. The clashes follow months of heightened tension between the Army Chief and the Rapid Support Force (RSF) head. Both the generals are at loggerheads as they fight for control of Sudan's major institutions.

### Rapid Support Forces in Sudan

- Trace its roots to the **Janjaweed militias** — a group of Arab tribes primarily based in western Sudan, including the contentious region of Darfur.
- **Janjaweed militias** called themselves **horsemen** – helped the Sudanese government **quell a rebellion by peasants in Darfur** by perpetrating violence against the rebels and civilians in isolated areas.
- According to the United Nations, an estimated 300,000 people were killed in the conflict between 2003 and 2008, and 2.5 million more were displaced.
- In 2007, the United States government declared the violence in Darfur **"genocide"** perpetrated by the government and its allied forces, including the Janjaweed militias.
- The **International Criminal Court** opened investigations into the genocidal violence, **indicting Sudan's then President Bashir**, on charges of genocide and crimes against humanity in 2009.

### Formal Constitution in 2013.

- The **Sudan President institutionalized** the Janjaweed militias in 2013, when it became the Rapid Support Forces (RSF) and Hamdan was appointed as its head.
- Then, RSF carried out **brutal violence across Sudan** – war crimes in Darfur in 2014 and 2015, killing over 100 people in Khartoum in 2019.
- Expanded to become the **President's guard** against any coup by the Army.
- In 2015, the RSF along with Sudan's Army, **supplied troops to fight in the war in Yemen** to support Saudi Arabia and the United Arab Emirates troops, in return for received money and weapons.
- Partnered with the Russian mercenary Wagner Group in 2017 to mine the vast gold reserves in Sudan, which expanded the political, economic and political influence of RSF. Led to conflict with the Army.
- Members include former military and intelligence officers with estimated 70,000 to 1,50,000 fighters. More fighters recruited from Sudan's east and north to widen support.

### About the International Criminal Court

- The International Criminal Court (ICC) investigates and, where warranted, tries individuals charged with the gravest crimes of concern to the international community: genocide, war crimes, crimes against humanity and the crime of aggression.
- Governed by an international treaty called 'The Rome Statute', the ICC is the world's first permanent international criminal court.
- India is not a party to Rome Statute along with US and China and thus, is not a member of ICC.
- ICC is not a UN organization but is has a cooperation agreement with the United Nations.
- When a situation is not within the Court's jurisdiction, the United Nations Security Council can refer the situation to the ICC granting it jurisdiction. This has been done in the situations in Darfur (Sudan) and Libya.

## 43. Gum Arabic: why Sudan war could hit your fizzy drinks and candy

### Why in News?

About 70% of the world's supply of gum arabic, for which there are few substitutes, comes from the acacia trees in the Sahel region that runs through Africa's third-largest country, which is being torn apart by fighting between the army and a paramilitary force.

### What is Gum Arabic

1. Gum Arabic is a natural gum originally consisting of the hardened sap of two species of the Acacia tree, Senegaliasenegal and Vachelliaseyal.
2. The term "gum arabic" does not legally indicate a particular botanical source.
3. The gum is harvested commercially from wild trees, mostly in Sudan (80%) and throughout the Sahel, from Senegal to Somalia.

### Health benefits of Gum Arabic

1. Gum arabic is a rich source of dietary fibers.
2. It is also used in food and pharmaceutical industries as a safe thickener, emulsifier, and stabilizer.
3. It is regarded as a prebiotic that enhances the growth and proliferation of the beneficial intestinal microbiota and therefore its intake is associated with many useful health effects.

### These health benefits include:

1. Improved absorption of calcium from the gastrointestinal tract
2. Anti-diabetic
3. Anti-obesity (gum arabic lowers the body mass index and body fat percentage)
4. Lipid lowering potential (gum arabic decreases total cholesterol, LDL, and triglyceride)
5. Antioxidant activities
6. Kidney and liver support
7. Immune function via modulating the release of some inflammatory mediators
8. Prebiotic improving the intestinal barrier function, preventing colon cancer, and alleviating symptoms of irritable bowel diseases.
9. In rats, a protective effect on the intestine against the adverse actions of the NSAID drug meloxicam.

## Other uses:

1. Food

Gum arabic is used in the food industry as a stabiliser, emulsifying agent, and thickening agent in icing, fillings, soft candy, chewing gum, and other confectionery and to bind the sweeteners and flavourings in soft drinks.

2. Painting and art

Gum arabic is used as a binder for watercolor painting because it dissolves easily in water.

3. Ceramics

Gum arabic has a long history as additives to ceramic glazes. It acts as a binder, helping the glaze adhere to the clay before it is fired, thereby minimising damage by handling during the manufacture of the piece.

4. Photography
5. Print making
6. Pyrotechnics

Gum arabic is also used as a water-soluble binder in fireworks composition.

7. Fuel Charcoal

## Distribution
The trees are native of North Africa and grow mainly in the sub.Sahara or Sahel zone of Africa and also in Australia, India and South America. The main populations of gum-producing Acacia species are found in Mauritania, Senegal, Mali, Burkina Faso, Niger, Nigeria, Chad, Cameroon, Sudan, Eritrea, Somalia, Ethiopia, Kenya, and Tanzania.
Acacia senegal is found in some parts of India mainly in the dry rocky hills of south east Punjab, in the northern Aravalli hills and other drier parts of Rajasthan and Gujarat.

## About Sudan
It shares its border with seven countries: Libya, Egypt, Chad, the Central African Republic, South Sudan, Ethiopia, and Eritrea.

## 44. Referendum for New Constitution in Uzbekistan

## Why in News?
Uzbekistan holds referendum on new Constitution that puts human rights at the forefront. In the referendum, the voters would be asked if they support rewriting the Constitution. Constitutions of 190 countries, including that of India, were studied to bring in holistic and comprehensive changes to the Constitution of the country.

## What's in the New Draft Constitution

- The new draft would **rewrite over 60%** of the current charter.
- Promises more freedoms, **better social protection, gender equality, and abolition of death penalty**, among others
- Defines Uzbekistan as a **sovereign, democratic, rule of law, social and secular state**
- All changes are based on the idea that **human rights and freedoms are paramount**.
- The new charter is believed to better the investment and business environment of the country.
- Constitutional Amendments represent "a transformation of the new Uzbekistan, where once the state came first, now the **citizen comes first**".
- Seeksto make Uzbekistan a more **social and welfare state** where the social protectionofthe common citizen is enhanced.
- A lot of thought has been given to vulnerablefamiliesandpeopleinneedofeducationmedicare,etc.
- There's greater **decentralisation of power.**

## Critic's View
If the new Constitution is adopted the **presidential term would be extended to seven years with a two consecutive term limit**. Mr. Mirziyoyev, whose current term expires in 2026, can serve as President for two more seven year terms. He came to power in 2016 and is currently serving his second term, which is the last under the current Constitution.

## About the Referendum

- Uzbekistan's Constitutional Commission received more than 2, 20,000 proposals from citizens during the drafting process.

- Election Commission officials made all arrangements for a free vote which would be held in the presence of international observers.
- The voting would take place in the presenceoftherepresentativesofallfiverecognizedpolitical parties in the countryaswellas**internationalobservers**,**media**and**civil society representatives**.

## What is Referendum?

- Referendum is a procedure whereby a **proposed legislation** is referred to the electorate for settlement by their **direct votes**.
- Politically, referendums are a tool for the expression of **direct democracy**.
- In modern times, most referendums are seen in the perspective of representative democracy.

## About Uzbekistan

- Uzbekistan is a **landlocked** Central Asian country of 35 million population.
- Became independent in 1991 following the disintegration of the Soviet Union

## About Bukhara – has 84 voting stations for the referendum

- 2000 year old Ancient City in Uzbekistan situated in **the Silk route**.
- Bukhara, Fergana and Samarkand in Uzbekistan emerged as **major towns on the trade routes linking India with Europe and China**.
- **Indian merchants** based in Samarkand and Bukhara were an integral part of the local economy in Uzbekistan.

## India-Uzbekistan

- **India's Election Commission** has been **invited to witness** the "historic" referendum on the constitutional reforms.
- The ties between India and Uzbekistan have been on an upswing in the last few years.
- Both sides have shown keen interest in further expanding the ties in a number of areas including **trade and investment, energy and people-to-people exchanges**.

**POLITY**

**1. CERT-in may be exempted form giving information under RTI Act, says centre**

**Concept :**

- The Central Government recently informed that the **Indian Computer Emergency Response Team (CERT-in) may soon be exempt from responding to queries under the Right to Information (RTI) Act.**
- The Department of Personnel and Training has reviewed a proposal from the Ministry of Electronics and Information Technology to **include CERT-in in the Second Schedule to the RTI Act, which deals with exempted organisations** like the Central Bureau of Investigation (CBI) and the Border Security Force.

**Section 24 and Second Schedule of RTI**

- **Section 24 of the RTI Act 2005**:
- It says that this **law is not applicable to the intelligence and security organisations specified in the Second Schedule.**
- However, the only exception these organisations have is for information on allegations of corruption and human rights violations.
- **Second Schedule:**
- It **includes intelligence and security agencies under its ambit**.
- Some of them are (i) Intelligence Bureau (IB), (ii) Research and Analysis Wing (RAW) of the Cabinet Secretariat (iii) Directorate of Revenue Intelligence (DRI), (iv) Special Frontier Force (SFF), (v) Border Security Force (BSF) (vi) National Security Guards (NSG) and (Vii) Assam Rifles.
- **Section 8 of the RTI:**
- It deals with **exemption from disclosure of information under this legislation.**
- It says that there shall be no obligation on Government to provide any citizen information, disclosure which will affect (i) India's sovereignty and integrity, (ii) security, (iii) strategic, scientific or economic interests of the state and (iv) relations with foreign States or (v) will lead to incitement of an offence.

**About Indian Computer Emergency Response Team (CERT-in):**

- CERT-In is a **functional organisation of the Ministry of Information & Electronics Technology.**
- It is the **national nodal agency for responding to computer security incidents** as and when they occur.
- Objective: Securing Indian cyberspace.
- CERT-In has been **operational since January 2004.**
- **Functions:**
  - Collection, analysis and dissemination of information on cyber incidents;
  - Forecast and alerts of cyber security incidents;
  - Emergency measures for handling cyber security incidents;
  - Coordination of cyber incident response activities;
  - Issue guidelines, advisories, vulnerability notes and whitepapers relating to information security practices, procedures, prevention, response and reporting of cyber incidents.

**2. Gujarat HC sets aside CIC order seeking information on Prime Minister's MA degree, fines Arvind Kejriwal**

The Gujarat High Court said on Friday, 31 March, that the Prime Minister's Office (PMO) need not furnish PM Modi's undergraduate and post-graduate degree certificate.

In ruling so, the court set aside an order by the Chief Information Commission (CIC) asking the PMO, Gujarat University and Delhi University to file details of Modi's graduate and post graduate degrees.

Additionally, the Court has also imposed a ₹25,000 fine on Arvind Kejriwal who had asked for details of the PM's degree certificate.

**Exemption from disclosure of information is provided on sec 8 of RTI Act.**

Notwithstanding anything contained in this Act, there shall be no obligation to give any citizen, —

- information, disclosure of which would prejudicially affect the sovereignty and integrity of India, the security, strategic, scientific or economic interests of the State, relation with foreign State or lead to incitement of an offence;
- information which has been expressly forbidden to be published by any court of law or tribunal or the disclosure of which may constitute contempt of court;
- information, the disclosure of which would cause a breach of privilege of Parliament or the State Legislature;
- information including commercial confidence, trade secrets or intellectual property, the disclosure of which would harm the competitive position of a third party, unless the competent authority is satisfied that larger public interest warrants the disclosure of such information;
- information available to a person in his fiduciary relationship, unless the competent authority is satisfied that the larger public interest warrants the disclosure of such information;
- information received in confidence from foreign government

- information, the disclosure of which would endanger the life or physical safety of any person or identify the source of information or assistance given in confidence for law enforcement or security purposes;
- information which would impede the process of investigation or apprehension or prosecution of offenders;
- cabinet papers including records of deliberations of the Council of Ministers, Secretaries and other officers: Provided that the decisions of Council of Ministers, the reasons thereof, and the material on the basis of which the decisions were taken shall be made public after the decision has been taken, and the matter is complete, or over: Provided further that those matters which come under the exemptions specified in this section shall not be disclosed;
- information which relates to personal information the disclosure of which has not relationship to any public activity or interest, or which would cause unwarranted invasion of the privacy of the individual unless the Central Public Information Officer or the State Public Information Officer or the appellate authority, as the case may be, is satisfied that the larger public interest justifies the disclosure of such information: Provided that the information, which cannot be denied to the Parliament or a State Legislature shall not be denied to any person.

## CIC

- The Chief Information Commissioner(CIC) and Information Commissioners(CI) shall be **appointed by the President on the recommendation of a committee** consisting of
  - The Prime Minister, who shall be the Chairperson of the committee.
  - The Leader of Opposition in the Lok Sabha.
  - A Union Cabinet Minister to be nominated by the Prime Minister.
- Section 12(5) of the RTI Act 2005 provides that the CIC and IC shall be persons of eminence in public life with wide knowledge and experience in law, science and technology, social service, management, journalism, mass media or administration and governance.
- Also, CIC/IC shall not be a MP or MLA, or hold any other office of profit or connected with any political party or carrying on any business or pursuing any profession.
- CIC **shall hold office for a term of five years** from the date on which he enters upon his office and **shall not be eligible for reappointment**
- Information Commissioner(IC) shall also hold office for a term of five years from the date on which he enters upon his office and shall not be eligible for reappointment of IC. However, IC is eligible for appointment as CIC
- Where the Information Commissioner is appointed as the Chief Information Commissioner, his term of office shall not be more than five years in aggregate as the Information Commissioner and the Chief Information Commissioner.

## 3. ICCR to build ambassador programme among foreign students in India

**Concept :**

- The **Indian Council for Cultural Relations (ICCR)** aims to **promote India's cultural and creative heritage globally by using the experiences of over 48,000 foreign students** studying in India as brand ambassadors.
- ICCR will **organize Exit Engagement Evenings (E-3) with foreign students** in various Central and State universities, institutes, and agricultural colleges of the country, three or four months before they finish their courses.
- In April 2022, **ICCR launched the India Alumni Portal**, a platform to connect with foreign students worldwide who have studied in India.
- **Values shown**: Cultural Diplomacy, Soft Diplomacy, Brand Ambassadorship, International Education, Networking, and Alumni Engagement.

**About ICCR**

- The **Indian Council for Cultural Relations (ICCR)** was founded in 1950 by **Maulana AbulKalam Azad**.
- It is an **autonomous organisation of the Government of India**, involved in India's external cultural relations i.e., cultural diplomacy.
- Its **objectives are:**
  - to actively participate in the formulation and implementation of policies and programmes pertaining to India's external cultural relations.
  - to foster and strengthen cultural relations and mutual understanding between India and other countries,
  - to promote cultural exchanges with other countries and people, and to develop relations with nations.
- It is **running 36 cultural centres** in **different countries** with the promotion of Indian culture and projecting India as a hub for higher education.
- It **instituted several awards for foreign nationals** as a way to promote India's culture abroad:
  - Distinguished Indologist Award
  - World Sanskrit Award
  - Distinguished Alumni Award – Citation and Plaque
  - Gisela Bonn Award

**4. Undue delay in a trial can be a ground for granting bail**

**Concept:**

- Supreme Court last week held that "undue delay" in a trial can be a ground for granting bail to an accused even under stringent special legislation such as the **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.**
- The ruling is significant because the bar for bail otherwise is quite high under the law, similar to the standards in anti-terror legislation.

**Details**

- **NDPS is an exception to the ordinary rules for granting bail.**
- Under **Section 37 of the Act**, for a court to grant bail it has to be satisfied that "**that there are reasonable grounds for believing that he is not guilty of such an offence**" and that upon release, "**isn't likely to commit any offence**."
- This high bar, requiring the accused to prove innocence at the time of seeking bail, ensures **getting bail under the law is virtually impossible for certain offences**.
- Now, the SC has said that the condition **seeking the court's satisfaction to the extent that an accused is not guilty of an offence "has to be interpreted reasonably."**
- **In a 2008 verdict** in 'VamanNarainGhiya v. State of Rajasthan', the **Supreme Court has upheld the stringent bail provisions under NDPS.**

**Undue Delay in Law**

- The Court said that the **stringent conditions under Section 37 of the NDPS Act cannot override the general law for granting bail** for **undue delay** in the trial.
- **Section 436A of the Code of Criminal Procedure** requires an **accused to be granted bail if the trial is not concludedwithin specified periods**.
- Moreover, the expression "reasonable grounds" used in Section 37 is not defined in the statute, thereby widening the scope of judicial interpretation.

**Section 436A of CrPC**

- Section 436A of the CrPC provides, "Where a person has, during the period of investigation, inquiry or trial under this Code of an offence under any law (not being an offence for which the punishment of death has been specified as one of the punishments under that law) **undergone detention for a period extending up to one-half of the maximum period of imprisonment specified for that offence under that law**, he shall be released by the Court on his personal bond with or without sureties."
- Section 436A also requires **that no person shall be detained during the period of investigation, inquiry, or trial for more than the maximum period of imprisonment provided for the offence.**

*For Further notes on Bail, refer – https://optimizeias.com/bail/*

**5. Centre 'appropriate' party to respond to plea on disqualified lawmakers, says EC**

**Concept :**

- The Election commission said it would be "appropriate" to have the Union government deal with the disqualification issue.
- A petition has been filed in SC that an **MP or an MLA who has either been disqualified from the House under the Tenth Schedule (anti-defection law) or under Article 191(1)(e) of the Constitution should be barred from contesting elections for five years**.
- This is to discourage MP/MLAs from switching the political party to gain political favour.

**Details**

- The Election Commission in the Supreme Court has chosen to maintain a distance on the question whether a disqualified lawmaker should be banned from contesting elections for five years.
- The **commission said it would be "appropriate" to have the Union government deal with the issue.**
- Election commission stated that the **issue involved in this matter pertains to the interpretation of Article 191(1)(e) of the Constitution.**
- It relates to matters that do not have a nexus with the conduct of elections in terms of the remit of the Commission under Article 324.
- Therefore Union government is the appropriate party for the adjudication of the prayers made in the petition

**Article 191(1)(e) of Indian Constitution:**

- **Article 191(1)(e)** gives the **various grounds of disqualification** "for being chosen as, and for being a member of the Legislative Assembly or Legislative Council of a State" on:
- Holding an office of profit
- Being of unsound mind or undischarged solvent

- Being a non-citizen or voluntarily acquiring the citizenship of a foreign state
- Being under any acknowledgement of allegiance or adherence to a foreign state.
- If an **MLA or an MLC is "disqualified by or under any law made by Parliament"**

## Powers of EC for disqualification

- Under the Constitution, the **Commission has advisory jurisdiction in the matter of post-election disqualification** of **sitting members** of Parliament and State Legislatures.
- The **opinion of the Commission** in all **such matters is binding on the President** or, as the case may be, the Governor to whom such opinion is tendered.
- Further, the cases of persons found guilty of corrupt practices at elections which come before the SC and High Courts are also referred to the Commission for its opinion on the question as to whether such person shall be disqualified and, if so, for what period.
- The Commission has the **power to disqualify a candidate who has failed to lodge an account of his election expenses** within the time and in the manner prescribed by law.

## Other powers of EC

- To **determine the territorial areas of the electoral constituencies** throughout the country on the basis of the Delimitation Commission Act of Parliament.
- To **prepare and periodically revise electoral rolls** and to register all eligible voters.
- To **grant recognition to political parties and** allot election symbols to them.
- Election Commission ensures a level playing field for the political parties in election fray, through strict observance by them of a Model Code of Conduct evolved with the consensus of political parties.

## 6. Price of 651 essential drugs down by 6.73 percent

### Concept :

- According to Health Ministry sources, India has been taking steps to ensure the availability of affordable medicines for the masses, with a significant reduction of 6.73% in **essential medicines' pricing.**

### Details

- In 2022, after a gap of five years, the government prepared a new Essential Medicine list.
- **National Pharmaceutical Pricing Authority (NPPA**) had been able to fix the ceiling prices of 651 medicines so far out of the over 870 scheduled drugs listed under the **National List of Essential Medicines (NLEM**).

### National List of Essential Medicines (NLEM).

- It is one of the key instruments in a balanced healthcare delivery system of a country which inter alia includes accessible, affordable quality medicine at all the primary, secondary, tertiary levels of healthcare.
- The **first National List of Essential Medicines of India was prepared and released in 1996.**
- It focuses on three aspects – cost, safety and efficacy Aims and objectives-
- Its primary aim is to promote the rational use of medicines considering three important aspects — cost, safety and efficacy.
- "The concept is based on the premise that a limited list of carefully selected medicines will improve quality of healthcare, provide cost-effective healthcare and better management of medicines."

### Types of drugs included are-

- Typically, **once NLEM is released, the department of pharmaceuticals under the ministry of chemicals and fertilizers adds them to the Drug Price Control Order, after which NPPA fixes the price.**
- However, this year a standing committee was put in place to ensure some essential medicines are "adequately available at lower prices".
- The list includes anti-infective medicines to treat diabetes such as insulin — HIV, tuberculosis, cancer, contraceptives, hormonal medicines and anesthetics.

### Factors for inclusion of a drug in the list-
Several factors influence the decision to include a drug in the NLEM.

- As per the 2015 regulations, "every medicine may be necessary or even critical for specific disease conditions for which it is indicated. But in the context of NLEM, a medicine may be essential considering the population at large and should fit into the definition mentioned earlier."
- A changing disease burden also impacted the decision-making process. Other factors include efficacy, safety and cost-effectiveness.
- A drug is removed from NLEM if another medicine performs better in terms of these above-mentioned factors.

### Need for the NLEM-

- **Drugs listed under NLEM** — also known as scheduled drugs — will be cheaper because the National Pharmaceutical Pricing Authority (NPPA) caps medicine prices and changes only based on wholesale price index-based inflation.
- They account for 17-18 per cent of the estimated Rs 1.6-trillion domestic pharmaceutical market. Companies selling non-scheduled drugs can hike prices by up to 10 per cent every year.

**Importance of NLEM-**

- NLEM plays an important role in ensuring the accessibility of affordable quality medicines at all levels of healthcare.
- This will give a boost to cost-effective, quality medicines and contribute towards a reduction inOut of Pocket Expenditure on healthcare for the citizens.
- This is critical because the recently released National Health Accounts Estimates 2018-19 point to a high burden on households to pay for healthcare, which is a key reason pushing Indians into poverty.
- In Uttar Pradesh for example, out-of-pocket health expenditure accounts for 71.3 per cent of the state's total health expenditure. For India, the figure was 48.2 per cent.

*For further notes on NPPA and Drug Pricing, refer – https://optimizeias.com/national-pharmaceutical-pricing-authority-nppa-2/*

## 7. Lokpal closes 68% graft complaints against officers without action: report

**Concept:**

- According to a report, c**lose to 68% of corruption complaints against public functionaries filed with the Lokpal of India were disposed of without any action in the last four years.**
- Further, it was seen that the **Lokpal has not prosecuted even a single person accused of graft to date.**
- The **Lokpal of India is the country's first anti-corruption office established under the Lokpal and Lokayuktas Act, 2013 to investigate complaints against public functionaries, including the Prime Minister.**
- Although the Lokpal and Lokayuktas Act was enacted in 2013, India's first Lokpal, Justice Pinaki Chandra Ghosh along with eight other members were appointed only in March 2019.
- As per the data provided by the Lokpal office to a parliamentary panel on the Department of Personnel and Training (DoPT), since 2019-20, Lokpal had received about 8,703 complaints, out of which only 5,981 complaints were disposed of and the office said that only three complaints were fully investigated.
- Additionally, close to 90% of the complaints were rejected for not being "in the prescribed format".
- The Lokpal was allocated a budget of ₹197 crores in 2022-23 and till the end of January 2023, the Lokpal had incurred an expenditure of ₹152 crores.

**About Lokpal:**

- The Lokpal is an **independent statutory body** established under **Section 3 of the Lokpal and Lokayuktas Act, 2013.**
- The Act allows for setting up of anti-corruption ombudsman called Lokpal at the Centre.

**Composition:**

- The Lokpal will **consist of a chairperson and a maximum of eight members.**
- **Chairperson should have been a Chief Justice of India**, or is or **has been a judge of the Supreme Court,** or an eminent person who fulfils eligibility criteria as specified.
- **50% of the members are to be judicial members provided that not less than 50% of the members belong to the Scheduled Castes, Scheduled Tribes, OBCs, minorities, and women.**

**Inquiry Wing:**

- Lokpal will have an Inquiry Wing for conducting preliminary inquiry into any offence alleged to have been committed by a public servant punishable under the Prevention of Corruption Act, 1988.

**Prosecution Wing**:

- It will also have a Prosecution Wing for the prosecution of public servants in relation to any complaint by the Lokpal under this Act.

**Powers:**

- The Lokpal will have the **power of superintendence and direction over any investigation agency including CBI for cases referred to them by the ombudsman**.
- As per the Act, the Lokpal can summon or question any public servant if there exists a prima facie case against the person, even before an investigation agency (such as vigilance or CBI) has begun the probe.
- Any officer of the CBI investigating a case referred to it by the Lokpal, shall not be transferred without the approval of the Lokpal.
- An **investigation must be completed within six months**. However, the Lokpal or Lokayukta may **allow extensions of six months at a time provided the reasons for the need of such extensions are given in writing**.
- Special courts will be instituted to conduct trials on cases referred by Lokpal.

**Jurisdiction of Lokpal:**

- It covers a **wide range of public servants — from the Prime Minister (PM), ministers and MP, to groups A, B, C, D officers of the central government** including the chairperson and members of the Lokpal. However, there are some exceptions for PM:
- Lokpal **cannot inquire allegations against the PM relating to international relations, external and internal security, public order, atomic energy, and space.**
- Also, **complaints against the PM are not to be probed unless the full Lokpal bench considers the initiation of inquiry** and **at least 2/3rds of the members approve it**.
- Such an inquiry against the Prime Minister (if conducted) is to be held in camera and if the Lokpal concludes that the complaint deserves to be dismissed, the records of the inquiry are not to be published or made available to anyone.

## 8. New panel for solving issue of stalled housing project formed

**Concept:**

- The Union Housing and Urban Affairs Ministry **has set up a 14-member committee headed by former NITI Aayog CEO Amitabh Kant**, to examine issues related to stalled real estate projects and recommend various ways for their completion.
- The panel will deliberate on the **issues of legacy stalled projects** and **suggest ways to complete and hand over these projects to homebuyers in a time-bound manner,** the Ministry order states.
- The ministry has notified the formation of the committee almost a year after the Central Advisory Council (CAC) headed by Housing and Urban Affairs Minister Hardeep Singh Puri decided to set up the committee.
- **Note:** Legacy Project means old and hard to complete projects.

## 9. Online platforms must take down fake news

**Concept :**

- **Social media platforms and other intermediaries** on the Internet are now **required to make sure that "fake news" articles about the Union Government**, which have been declared as such by the Press Information Bureau (PIB), are taken down from their platforms when they are alerted to such posts.

**About the development:**

- The new amendment of the IT Rules 2021 means **that platforms will no longer enjoy legal immunity on content posted by their users; platforms can now be called 'as a party' in court proceedings.**
- The changes were already being **notified through the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2023, amending the IT Rules, 2021.**
- Ministry of Information & Broadcasting (MIB) sources had mentioned that the fact **check unit would reach out to relevant government departments to get their view on whether a piece of news is 'fake or not', and take a call accordingly.**

**Section 79 of the Information Technology Act**

- **Section 79 says** that any **intermediary shall not be held legally or otherwise liable for any third party information, data, or communication link made available or hosted on its platform.**
- This protection shall be applicable if the said intermediary does not in any way, initiate the transmission of the message in question, select the receiver of the transmitted message and does not modify any information contained in the transmission.
- The protection accorded under Section 79, however, is not granted if the intermediary, despite being informed, does not immediately disable access to the material under question.
- The intermediary must not tamper with any evidence of these messages or content present on its platform, failing which it lose its protection under the Act.

**Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021:**

- Intermediaries are entities that store or transmit data on behalf of other persons, and include telecom and internet service providers, online marketplaces, search engines, and social media sites.
- The Information Technology Act, 2000 (IT Act) was amended in 2008 to provide an exemption to intermediaries from liability for any third party information.
- Following this, the IT (Intermediary Guidelines) Rules, 2011 were framed under the IT Act to specify the due diligence requirements for intermediaries to claim such exemption.
- These rules are made by amending the provisions under IT rules 2011.
- The key additions under the 2021 Rules include additional due diligence requirements for certain social media intermediaries, and a framework for regulating the content of online publishers of news and current affairs, and curated audio-visual content.

**Other Laws Governing Fake News:**

- There **is no specific law against fake news in India**. Free publication of news flows from Article 19 of the Constitution guaranteeing freedom of speech.
- **Press Council of India, a regulatory body**, can warn, admonish or censure the newspaper, the news agency, the editor or the journalist or disapprove the conduct of the editor or the journalist if it finds that a newspaper or a news agency has violated journalistic ethics.
- **News Broadcasters Association (NBA)** represents the private television news and current affairs broadcasters. The self-regulatory body probes complaints against electronic media.
- **Indian Broadcast Foundation (IBF)** also looks into the complaints against contents aired by channels.
- **Broadcasting Content Complaint Council (BCCC)** admits complaints against TV broadcasters for objectionable TV content and fake news.
- **Indian Penal Code (IPC)** has certain sections which could curb fake news: Section 153 (wantonly giving provocation with intent to cause riot) and section 295 (injuring or defiling place of worship with intent to insult the religion of any class) can be invoked to guard against fake news.
- **Civil or Criminal Case for Defamation** is another resort against fake news for individuals and groups hurt by the fake news. Press Information Bureau (PIB):

**Press Information Bureau (PIB)**

- The **Press Information Bureau (PIB) is the nodal agency of the Government of India** to **disseminate information to the print and electronic media** on government policies, programmes, initiatives and achievements.
- It functions as an **interface between the Government and the media** and also serves to provide feedback to the Government on people's reaction as reflected in the media.
- PIB disseminates information through different modes of communication viz. press releases, press notes, feature articles, backgrounders, photographs, database available on Bureau's website.

**10. Principles of Natural Justice and Proportionality**

**Concept:**

- The Supreme Court lifted a broadcasting ban on a Malayalam news channel 'MediaOne'.
- The court blasted the government for silencing voices in the media who "speak truth to power" by branding them as "anti-establishment".

**Background**

- The Ministry of Information and Broadcasting (MIB) has earlier refused to renew broadcast license of a Malayalam news channel.
- The Ministry of Home Affairs had declined to grant security clearance to the channel's promoters citing alleged links between radical groups.
- Hence the news agency approached Kerala High Court, which upheld the ban on February 9, 2022
- The Supreme Court granted temporary relief and allowed it to resume operations.

**Supreme Court's ruling**

- The **Supreme Court set aside earlier ban orders and upheld the channel's appeal on two procedural grounds**, namely
- **Principles of natural justice and**
- **Proportionality**

**Articles invoked in the judgment**

- The Court stated that the **burden shifts on the Centre to prove that the procedure followed was reasonable and in compliance with the requirements of Articles 14 and 21 of the Constitution.**
- The Court used the **standard of proportionality to test the reasonableness of the procedure** in the present case and assessed **the validity of public interest immunity claims** based on the "**structured proportionality standard**".
- The Court found that the reasons **for denying security clearance to the channel were not legitimate** purposes for the restriction of the right of freedom of speech protected **under Article 19(1)(a) of the Constitution.**

**Key concepts involved**
**Principles of natural justice :**

- The **principles of natural justice are a set of procedural rules that ensure fairness and justice in administrative and legal proceedings.**
- These principles are based on the fundamental idea that everyone is entitled to a fair hearing, and they are aimed at preventing arbitrary or biased decisions by decision-makers.
- The SC bench allowed the challenge to the MHA order and judgment of the High Court on account of the principles of natural justice constitutionalized by its judgment in its 1978 ruling in "Maneka Gandhi vs Union of India"

- Actions which violate procedural guarantees can be struck down even if non-compliance does not prejudice the outcome of the case.

**Proportionality :**

- The principle requires that the **decision or action must be proportionate to the objective it seeks to achieve.**
- In other words, the **means employed to achieve the objective must be no more than necessary to achieve it,** and **the harm caused by the decision or action must not be excessive in relation to the benefit gained.**
- The validity of the claim of involvement of national security considerations must be assessed on the test of whether there is material to conclude that the non-disclosure of information is in the interest of national security.
- Courts can assess the validity of public interest immunity claims based on the "structured proportionality standard", said the SC.
- The SC observed that sealed cover proceedings infringe the principles natural justice and open justice.

## 11. MHA to provide financial assistance for prisoners

**Concept** :

- Recently, Ministry of Home Affairs (MHA) has launched a scheme which envisages monetary aid to poor inmates who are unable to afford the penalty or the bail amount.

**About the initiative:**

- In line with one of the **announcements of the Union Budget**, '**Support for Poor Prisoners**', the scheme envisages financial support to poor persons.
- The scheme will enable underprivileged prisoners, majority of whom belong to socially disadvantaged or marginalised groups with lower education and income levels, to get out of prison.
- The technology-driven solutions were aimed and put in place to ensure that benefits reach the poor prisoners; **reinforcing the E-prisons platform**; **strengthening of District Legal Services Authority** and sensitisation and capacity building of stakeholders to ensure that quality legal aid is made available to needy poor prisoners.

**Need of the initiative:**

- According to **Prison Statistics India 2021**, a **report published by the National Crime Records Bureau (NCRB), Ministry of Home Affairs**, between 2016-2021, the number of convicts in jails decreased by 9.5 percent whereas the number of undertrial inmates increased by 45.8 percent.

**E- prisons Project**

- This project **aims at computerization of the functioning of prisons in the country**. It has been operationalised in all States and Union Territories.
- **e-Prisons data has been integrated with the Police and Court system** under **the Inter-operable Criminal Justice System.**
- ePrisons application suite has been **developed by National Informatics Centre (NIC), Ministry of Electronics & IT (MeitY).**

**It has 3 components:**

- **e-Prison Management Information System** (MIS): It is used at the prisons for their day to day regular activities.
- **National Prisons Information Portal:** It is a citizen centric portal showing statistical data of various prisons in the country.
- **Kara Bazaar**: Portal for showcasing and selling the products manufactured in various prisons of the country by inmates.

**Inter-operable Criminal Justice System:**

- It is a **common platform for information exchange and analytics of all the pillars of the criminal justice system** comprising Police, Forensics, Prosecution, Courts, Prisons.
- **Purpose**: To reduce errors and time taken in sharing of necessary information between the pillars, which often lead to larger challenges like longer duration of trials, poorer convictions, transit losses of documents etc.
- Some other critical benefits arising out of the ICJS ecosystem are usable analytics products like the National Database on Sexual Offenders (NDSO) to identify & track repeat and habitual sexual offenders.

**Other Government Interventions:**

- **Modernization of Prisons scheme**: The scheme for modernisation of prisons was launched in 2002-03 with the objective of improving the condition of prisons, prisoners and prison personnel.
- **E-Prisons Project:** The E-Prisons project aims to introduce efficiency in prison management through digitization.
- **Model Prison Manual 2016**: The manual provides detailed information about the legal services (including free services) available to prison inmates.

- **National Legal Services Authority (NALSA ):** It was constituted under the Legal Services Authorities Act, 1987 which came into force on 9th November, 1995 to establish a nationwide uniform network for providing free and competent legal services to the weaker sections of the society.

## 12. Transfer of Criminal Cases

**Concept :**

- The Supreme Court in a recent judgement held that criminal **cases under trial should be transferred** from one State to another **only in "exceptional circumstances"**.
- The court opined that the power to transfer cases under Section 406 of the Code of Criminal Procedure (Cr.PC) should be used sparingly and only when justice was apparently in grave peril as the unnecessary shifting of cases would affect the morale of the State judiciary and prosecution agency.

**Possible situations for transfer:**

- The judgement summarised a series of Supreme Court verdicts giving the possible situations in which an ongoing trial could be transferred.
- These include instances in which,
- the State or the prosecution collaborates closely with the accused;
- when evidence suggests that the accused may sway the prosecution's witnesses or hurt the complainant physically;
- when the accused is likely to suffer comparable hardship;
- when there is a communally tensed situation indicating some proof of inability of holding fair and impartial trial because of the accusations made and the nature of the crime committed by the accused;
- existence of some material on interference with the course of justice by interested parties.
- The **convenience of parties and witnesses as well as the language spoken by them could also act as a relevant factor when deciding a transfer petition.**

**Section 406:**

- The **transfer of a criminal case** from one state to another in India can be **done under Section 406A of the Code of Criminal Procedure (CrPC)** by the **Supreme Court of India**.
- This power is **exercised by the Supreme Court in exceptional cases** to ensure that the ends of justice are served.
- In order to transfer a case from one state to another, **an application needs to be filed in the Supreme Court of India, either by the accused or the prosecution or any other party to the case**.
- The application must provide reasons as to why the transfer is necessary, such as the convenience of the parties or the location of the witnesses.
- The Supreme Court will consider various factors before granting the transfer of a case from one state to another, including the nature of the offence, the stage of the trial, the availability of evidence, the convenience of the parties, and the interests of justice.
- The Supreme Court may also impose conditions or give directions to ensure that the transfer of the case does not cause undue delay or inconvenience to the parties involved.

## 13. SC to hear identification of minorities at state level

**Concept :**

- The Supreme Court is scheduled to hear on Monday a batch of pleas seeking the identification of minorities at the state level.
- A bench of justices Sanjay Kishan Kaul and Ahsanuddin Amanullah will take up for hearing the petitions raising various issues related to the identification of minorities, including challenging the **constitutional validity of the National Minority Commission Act, 1992 and the National Commission for Minorities Educational Institutes Act, 2004.**
- The pleas include the one filed by advocate Ashwini Upadhyay who has sought directions for **framing guidelines for the identification of minorities at the state level, contending that Hindus are in minority in 10 states.**

**How is a community notified as a minority?**

- Under Section 2(c) of the National Commission for Minorities Act of 1992 **central government has the power to notify a community as a minority**

**Notified Minorities in India**

- Currently, only those communities notified under **section 2(c) of the NCM Act, 1992, by the central government are regarded as minority.**
- In 1993, the first Statutory National Commission was set up and five religious communities viz. The Muslims, Christians, Sikhs, Buddhists and Zoroastrians (Parsis) were notified as minority communities.
- In 2014, Jains were also notified as a minority community.

**Constitutional Provisions for Minorities**

## Article 29

- It provides that any section of the citizens residing in any part of India having a distinct language, script or culture of its own, shall have the right to conserve the same.
- It grants protection to both religious minorities as well as linguistic minorities

## Article 30:

- All minorities shall have the right to establish and administer educational institutions of their choice.
- The protection under Article 30 is confined only to minorities (religious or linguistic) and does not extend to any section of citizens (as under Article 29).

## Article 350-B:

- The 7th Constitutional (Amendment) Act 1956 inserted this article which provides for a Special Officer for Linguistic Minorities appointed by the President of India.
- It would be the duty of the Special Officer to investigate all matters relating to the safeguards provided for linguistic minorities under the Constitution.

## Judgements related to determination on minority status

- **TMA Pai Case:**
- The SC had said that for the purposes of Article 30 that deals with the rights of minorities to establish and administer educational institutions, religious and linguistic minorities have to be considered state-wise.
- **Bal Patil Case:**
- In 2005, the SC in its judgement in 'Bal Patil' referred to the TMA Pai ruling.
- The legal position clarifies that henceforth the unit for determining status of both linguistic and religious minorities would be 'state'.

## 14. AAP gets tag: How a 'national party' is defined

### What is a national party?

- As the name suggests, a national party has a presence 'nationally', as opposed to a regional party whose presence is restricted to only a particular state or region.
- A certain stature is sometimes associated with being a national party, but this does not necessarily translate into having a lot of national political clout. Some parties, despite being dominant in a major state — such as the DMK in Tamil Nadu, BJD in Odisha, YSRCP in Andhra Pradesh, RJD in Bihar, or TRS in Telangana—and having a major say in national affairs, remain regional parties.

### Recognition of National and State Parties

- The Election Commission registers political parties for the purpose of elections and grants them recognition as national or state parties on the basis of their poll performance.
- The other parties are simply declared as registered unrecognised parties.
- The ECI has laid down the technical criteria for a party to be recognized as a national party. A party may gain or lose national party status from time to time, depending on the fulfilment of these conditions
- The recognition granted by the Commission to the parties determines their right to certain privileges like allocation of the party symbols, provision of time for political broadcasts on the state-owned television and radio stations and access to electoral rolls.
- Further, the recognized parties need only one proposer for filing the nomination. Also, these parties are allowed to have forty "star campaigners" during the time of elections and the registered–unrecognized parties are allowed to have twenty "star campaigners".
- The travel expenses of these star campaigners are not included in the election expenditure of the candidates of their parties.
- Every national party is allotted a symbol exclusively reserved for its use throughout the country.
- Similarly, every state party is allotted a symbol exclusively reserved for its use in the state or states in which it is so recognised. A registered-unrecognised party, on the other hand, can select a symbol from a list of free symbols.
- The national parties and state parties are also known as all-India parties and regional parties respectively.

### Conditions for Recognition as a National Party

- A party is recognised as a national party if any of the following conditions is fulfilled:
- If it secures six per cent of valid votes polled in any four or more states at a general election to the Lok Sabha or to the legislative assembly; and, in addition, it wins four seats in the Lok Sabha from any state or states; or
- If it wins two per cent of seats in the Lok Sabha at a general election; and these candidates are elected from three states; or
- If it is recognised as a state party in four states.

## Conditions for Recognition as a State Party

- A party is recognised as a state party in a state if any of the following conditions is fulfilled:
- If it secures 6% of the valid votes polled in the state at a general election to the legislative assembly of the state concerned; and, in addition, it wins 2 seats in the assembly of the state concerned; or
- If it secures 6% of the valid votes polled in the state at a general election to the Lok Sabha from the state concerned; and, in addition, it wins 1 seat in the Lok Sabha from the state concerned; or
- If it wins 3% of seats in the legislative assembly at a general election to the legislative assembly of the state concerned or 3 seats in the assembly, whichever is more; or
- If it wins 1 seat in the Lok Sabha for every 25 seats or any fraction thereof allotted to the state at a general election to the Lok Sabha from the state concerned; or
- If it secures 8% of the total valid votes polled in the state at a General Election to the Lok Sabha from the state or to the legislative assembly of the state. This condition was added in 2011.

## 15. TN Assembly resolution seeks 'time limit' for Governors to clear Bills

The Tamil Nadu Assembly on Monday adopted a resolution in which it criticized Raj Bhavan for stalling Bills and asked the Centre to fix a "specific time limit" for "Governors to give assent to Bills passed by the Legislatures

**Concept**

**Assent to bills under article 200 (i.e. assent of the Governor to the bills passed by the state legislature):**

- Giving assent to a Bill passed by the legislature is a normal constitutional act performed by the Governor.
- The Governor is an appointee of the President, which means the Union government.
- **Article 154(1) of the Constitution vests in the Governor the executive power of the State,** he is required to exercise that power in accordance with the Constitution. In other words, the Governor can act only on the aid and advice of the Council of Ministers.
- While there is not much deviation from the language used in the Government of India Act of 1935 in the context of the powers of the British era Governors, It is a settled constitutional position that the **Governor is only a constitutional head and the executive power of the State is exercised by the Council of Ministers.**
- **When a bill is sent to the governor after it is passed by state legislature**, he can:

    (a) Give his assent to the bill, or
    (b) Withhold his assent to the bill, or
    (c) Return the bill (if it is not a money bill) for reconsideration of the state

- However, if the **bill is passed again by the state legislature with or without amendments**, the **governor has to give his assent to the bill**, or
    - Reserve the bill for the consideration of the president (article 201). In one case such reservation is obligatory, that is, where the bill passed by the state legislature endangers the position of the state high court.
    - **In addition, the governor can also reserve** the bill if it is of the following nature:
        - Ultra-vires, that is, against the provisions of the Constitution.
        - Opposed to the Directive Principles of State Policy.
        - Against the larger interest of the country.
        - Of grave national importance.
        - Dealing with compulsory acquisition of property under Article the Constitution.

## 16. Public Interest Immunity Claim Procedure

**Concept :**

- The Supreme Court has expressed dissatisfaction with so-**called "sealed cover jurisprudence" and has developed a process for "public interest immunity claims"** as a less restrictive option for handling claims containing state secrets.

**Background**

- The Kerala High Court's decision upholding the order from the Information and Broadcasting Ministry decision to block MediaOne, a Malayalam news channel, from airing its programming was overturned by the Supreme Court.
- The High Court's ruling was based on information that the Home Ministry had only disclosed to it in a "sealed cover."
- The Supreme Court has frequently expressed dissatisfaction with so-called "sealed cover jurisprudence" and has **developed a process for "public interest immunity claims"** as a less severe option for handling state secret cases.

**Public interest immunity claim**

- The Supreme Court ruled that the following criteria must be **used to determine whether a claim concerning issues of national security is valid**:
- Whether there is sufficient evidence to conclude that information secrecy serves the interests of national security.
- Whether a reasonable person would make the same conclusion from the evidence.

- The court suggested that secret elements of the document be censored and a summary of the document's contents be supplied to fairly exclude materials following a successful public interest immunity claim.

*For further notes on Sealed Cover Jurisprudence, refer – https://optimizeias.com/sealed-cover-jurisprudence/*

## 17. States subsidy accounting must be transparent – CAG

**Concept :**

- The Comptroller & Auditor General (CAG) of India, Girish Chandra Murmu, on Monday said the **States must take measures to maintain proper accounting of subsidies, reduce fiscal deficits, remove revenue deficits and keep outstanding debts at an acceptable level.**
- **Details**
- There are fiscal sustainability risks and financial indiscipline in many States due to **off-budget borrowings, misclassification of revenue expenditure as capital expenditure** and because **state guarantees are not getting captured in finance accountin**
- These factors make qualitative and timely preparation of accounts by the CAG difficult.

**Constitutional Mandate**

- **Article 150 of the Constitution** mandates that the accounts of the Union and of the States has to be kept in a manner as prescribed by the President on the CAG's advice.
- **Section 10 of the Duties, Powers and Services Act** also **empowers the CAG to compile accounts of the central and State governments.**

**Integrated Financial Management System (IFMS)**

- It is a web-based solution designed to bring efficiency in financial planning and expenditure control in the States.
- This portal has brings various **stakeholders such as Department of Finance, Treasuries, Administrative Departments, Accountant General (AG), RBI and Banks on a single platform** with role based Smart Dashboards.
- Smart Dashboards have provided a better Decision Support System to all the stakeholders.

**Public Financial Management System (PFMS)**

- The Public Financial Management System (PFMS), earlier known as Central Plan Schemes Monitoring System (CPSMS), is a **web-based online software application developed and implemented by the Office of Controller General of Accounts (CGA), Ministry of Finance.**
- PFMS was initially started during 2009 as a Central Sector Scheme of Planning Commission with the objective of tracking funds released under all Plan schemes of the Government of India, and real time reporting of expenditure at all levels of Programme implementation.
- Subsequently in the year **2013, the scope was enlarged to cover direct payment to beneficiaries under both Plan and non-Plan Schemes.**
- In **2017, the Government scrapped the distinction between plan and non-plan expenditure.**
- The primary **objective of PFMS is to facilitate a sound Public Financial Management System for the Government of India (GoI) by establishing an efficient fund flow system as well as a payment cum accounting network.**
- At present, the **ambit of PFMS coverage includes Central Sector and Centrally Sponsored Schemes as well as other expenditures including the Finance Commission Grants.**
- PFMS provides various stakeholders with a **real time, reliable and meaningful management information system** and an **effective decision support system**, as part of the Digital India initiative of GoI.
- **PFMS** is **integrated with the core banking system in the country**.
- Implementation of the Public Financial Management System (PFMS) by the Central government had wide implications for State accounting so far as sanctions of State grants, funds transfer and monitoring were concerned.

## 18. SC's grant of bail to Lakhimpur-Kheri deaths accused raises questions about how similar or lesser offences are treated

**What is bail?**

- Bail is the **conditional release of a person** held under **legal custody in matters which are yet to be pronounced by the Court,** by **undertaking a promise to appear** in the Court as and when required.

**What governs bail in India:**

- The **Code of Criminal Procedure, 1973** governs the **terms of the bail**.
- Section 2 (a) of the CrPC,1973 defines the phrases "bailable offense" and "non-bailable offense" even though the Act does not define "bail" expressly.

**What are different categories of bail:**
**Bailable offences**

- **Section 2(a) of CrPC** categorizes a **bailable offence**.

- It means that an **offence that is classified as bailable in the First Schedule of the Code,** or which is classified as bailable under any other law.
- An accused **can claim bail as a matter of right** if he is accused of committing a bailable offence.
- Under **Section 436 of CrPC 1973**, a person accused of a bailable offence at any time while under arrest without a warrant and at any stage of the proceedings has the right to be released on bail.

**Non-bailable offences**

- A non-bailable offence is defined as any offence which is not a bailable offence.
- A person accused of a non-bailable offence **cannot claim bail as a righ**
- A person **accused of non-bailable offences can be granted bail** provided the **accused does not qualify** the following conditions:
1. There are reasonable grounds to believe that **he has committed an offence punishable with death penalty or life imprisonment**.
2. That the accused has **committed a cognizable offence** and he had been **previously convicted of an offence punishable with death, imprisonment for life or imprisonment of seven years or more** or if the accused been **convicted on two or more instances of a cognizable and non-bailable offence.**

**What are the types of bails in India:**

- **Regular bail:**
    - The court orders the **release of a person who is under arrest**, from police custody after **paying the amount as bail money**.
    - An accused **can apply for regular bail** under **Section 437 and 439 of CrPC.**
    - **Interim bail:**
    - This is a **direct order by the court** to provide **temporary and short term bail to the accused** until his **regular or anticipatory bail application is pending** before the court.
    - **Anticipatory bail:**
    - This is a **direct order of Sessions or High Court to provide pre-arrest bail to an accused of a crime.**
    - When the **person has an apprehension of being arrested**, the person can apply for anticipatory bail.

**19. Gujarat put MPLADS to best use in FY23; 4 UTs got no funds**

- Under MPLADS MPs can recommend works of developmental nature with emphasis on the creation of **durable community assets** in the areas of drinking water, primary education, public health, sanitation and roads in their constituencies.
- MPLAD is a **Central Sector Scheme** which was announced in December 1993.
- The recommendations of the works are made by the Members of Parliament for the betterment of the community.
- These works are **executed by District Authorities** in accordance with the respective State Government's financial, technical and administrative rules.
- Initially, the Scheme was under the control of the Ministry of Rural Development and Planning. In October, 1994, the scheme was transferred to the **Ministry of Statistics & Programme Implementation.**
- Under this scheme, every MP is entitled to spend **Rs 5 crore annually**.
    - MPs to get **₹2 cr. each** instead of previously approved ₹5 cr.
- According to the 'Guidelines on Members of Parliament Local Area Development Scheme (MPLADS)' published by the Ministry of Statistics and Programme Implementation in June 2016, the MPLAD funds can also be used for implementation of the schemes such as **Swachh Bharat Abhiyan, Accessible India Campaign** (Sugamya Bharat Abhiyan), conservation of water through **rain water harvesting** and **SansadAadarsh Gram Yojana**, etc.

**Functioning**

- Each year, MPs receive Rs. 5 crore in two instalments of Rs. 2.5 crore each. Funds under MPLADS are **non-lapsable**.
- Lok Sabha MPs have to recommend the district authorities projects in their Lok Sabha constituencies, while Rajya Sabha MPs have to spend it in the state that has elected them to the House.
- Nominated Members of both the Rajya Sabha and Lok Sabha can recommend works anywhere in the country.
- MPs are to recommend every year, works costing at least 15 per cent of the MPLADS entitlement for the year for areas inhabited by Scheduled Caste population and 7.5 per cent for areas inhabited by ST population.
- The District Authority would be responsible for overall coordination and supervision of the works under the scheme at the district level and inspect at least 10% of the works under implementation every year.

**How does MPLADS work?**

**Members of Parliament**
- recommend works based on local needs of the selected constituency

**District Authorities (District Collectors)**
- sanction eligible works
- select implementing agency
- responsible for implementation

**Ministry of Statistics and Programme Implementation (MoSPI) : Central Government**
- formulates MPLADS Policy
- Releases ₹ 5 crore anually, in installments of ₹ 2.5 crore, directly to District Authority
- establishes monitoring mechanisms

Completed and Ongoing works listed at DA's office and on www.mplads.gov.in

Citizens can file RTI to know about status of works and funds

## 20. SC to review 1992 judgement barring police custody beyond 15 days

**Concept:**

- The Supreme Court said that its existing position on whether an accused can be detained in police custody beyond a period of 15 days from the initial date of arrest needs a review.

**The case:**

- The Central Bureau of Investigation (CBI) had moved the Supreme Court seeking additional custody of an accused.
- The investigative agency's claim is that it requires fresh custody since he could not be interrogated by the CBI earlier despite police custody remand.
- The accused opposed this fresh demand for police custody **citing a 30-year-old precedent of the court which has ruled that police custody which shall be beyond the period of 15 days from the date of arrest is not permissible.**
- The Supreme Court in Central Bureau of Intelligence vs Anupam J. Kulkarni held that an accused cannot be detained in police custody after the lapse of 15 days from the date of arrest.

**What does the law say about police custody?**

- Although **magistrates mechanically grant police custody in virtually every case, the law allows police detention only in special circumstances.**
- Police custody is **granted by a magistrate for reasons that must be recorded in the order.**
- **Section 167 of the Code of Criminal Procedure** governs how this works.
- It gives power to the Magistrate to authorise the detention of the accused in such custody as such Magistrate thinks fit, **for a term not exceeding fifteen days in the whole.**
- This provision, the SC said is intended to protect the accused from the methods which may be adopted by some overzealous and unscrupulous police officers.

**Why is police custody allowed only at the time of arrest?**

- **After the 15-day police custody, further remand during the period of investigation can only be in judicial custody.**
- **Judicial custody is in a central jail under the supervision of a magistrate**, whereas police custody would be in a **police station for officers to interrogate an accused**.
- The law is a check on the state's power to restrict an individual's liberty so when the police know that they only have fifteen days, it will strive to finish the investigation on time.
- However, this is routinely **circumvented using an exception to the 15-day rule.**
- **The exception:**
- The 15-day bar **does not apply if the accused is involved in a different case arising out of a separate cause of action.**
- Then, even if he is in judicial custody in one case, he can formally be arrested in the other case and the police can seek custody again, starting another 15-day cycle.

**Judicial custody vs police custody**

- In police custody, the investigating authority can interrogate a person while in judicial custody, officials need the permission of the court for questioning.
- In **police custody**, the person has the right to legal counsel, and the right to be informed of the grounds which the police have to ensure.
- In **judicial custody**, the person is under the responsibility of the magistrate, while the **Prison Manual** comes into the picture for the routine conduct of the person.

| Police Custody | Judicial Custody |
|---|---|
| Police custody is defined as the immediate physical custody by the police of a person who has committed a crime | Judicial custody is ascribed by a judge or the court itself. |
| The person is arrested and brought to the police station for processing. | This custody is ordered by the judge, depending on the circumstances of the case. |
| The suspect can be interrogated by the police. | There is no interrogation done during a judicial custody, unless the situation calls for the action and with the permission of the judge. |
| Legal counsel is usually present in an interrogation to ensure that the suspect's rights are being respected and that no physical harm or brutality of any kind will occur. | No such action is needed. |
| Police custody is the protection and care provided by the police. | A person under the judicial custody is under the protection and safety of a judge. |

**What happens after the 15-day custody?**

- The CrPC allows an **accused to be released on bail if the investigation is not completed within the prescribed number of days.**
- This is usually referred to as **'default bail' or 'statutory bail'**.
- The first limit is 24 hours.
- Then, this can be extended by a magistrate to a maximum of 15 days.
- This **cannot be further exceeded beyond 60-90 days.**
- In its 1975 ruling in "**MatabarParida vs. State of Orissa**", the Apex Court held that **if it's not possible to complete the investigation between the 60-90 day period, then even in "erious and ghastly types of crime the accused will be entitled to be released on bail.**
- The objective of this provision is to ensure the investigating agency completes its investigation expeditiously within a reasonable time.

| Detention | Arrest | Custody |
|---|---|---|
| The action of detaining someone or the state of being detained in official custody. | Seize (someone) by legal authority and take them into custody. | Merely surveillance or restriction on the movement of the person concerned. |
| Police only need reasonable suspicion to hold the suspect | Police need hard evidence to arrest someone | Holding a person in custody for further inquiry and investigation |
| Less serious | More serious | More serious |
| May lead to an arrest, if more evidence found. | May lead to jail time if convicted. | There are two types of custody, Police and judicial depending upon the circumstances. |
| Does not show up on criminal record | Does show up on criminal record | It has police record. |
| Usually for a short period of time. Then they have to be let go or arrested. | Can be held until bail is posted or until their case comes to court. | Police custody is of 15 days and Judicial custody is of 60-90 days depends upon the case. |

**21. Abuse of preventive detention law**

**Concept :**

- Recently, the **Supreme Court (SC) of India observed that preventive detention laws in India are a colonial legacy** that confers arbitrary power to the state.
- The Court **warned that these laws are extremely powerful and have the potential to provide the state with free discretion.**

**Preventive Detention**

- Preventive detention means **detention of a person without trial and conviction by a court.** Its purpose is **not to punish a person for a past offence but to prevent him from committing an offence i**n the near future.

- The detention of a person cannot exceed three months unless an advisory board reports sufficient cause for extended detention.
- **Protection:**
- **Article 22 grants protection to persons who are arrested or detained.**
- Article 22 has two parts—the **first part deals with the cases of ordinary law** and the **second part deals with the cases of preventive detention law**.

**Two Types of Detentions:**

- **Preventive detention** is when a person is held in police custody only on the basis of a suspicion that they would conduct a criminal act or cause harm to society.
- The police have the authority to hold anyone they suspect of committing a criminal offence and also to make arrests without a warrant or a magistrate's authorization in certain cases.
- **Punitive detention**, which means detention as a punishment for a criminal offence. It occurs after an offence is actually committed, or an attempt has been made towards the commission of that crime.

**22. Rules for recognition as a national party**

**Concept :**

- On April 10th, 2023, the **AamAadmi Party (AAP) was accorded the status of a national party by the Election Commission of India (ECI).**
- However, other parties such as the **Trinamool Congress (TMC), the Communist Party of India (CPI), and the Nationalist Congress Party (NCP) have lost their national party status.**
- The ECI **also revoked the recognition of some parties as State parties.**

**What is a national party?**

- A national party refers to such a political party that has a **presence "nationally", whereas the presence of regional parties is limited to a particular state or region.**
- National parties are usually India's bigger parties, such as the Congress and BJP and a certain stature is associated with being a national party.
- According to the **Representation of People Act 1951**, registered **political parties can get recognition as "State" or "National" parties in the due course of time**.
- At present, **there are six parties in India with the status of a "national party" including** the BJP, Congress, Bahujan Samaj Party (BSP), CPI(M), National People's Party (NPP) and the AAP.

**Criteria to be recognised as a "national party"**

- The ECI **reviews the performance of recognised parties after every State Assembly election and general election to the Lok Sabha i**n order to accord the status of "State Party" or "National Party".
- The rules for recognition as a national party are specified by the ECI in **para 6B of the Election Symbols (Reservation and Allotment) Order, 1968.**
- According to the order, a registered party will be eligible to be accorded national status if it manages to:
- Be **recognised as a "State party" in four or more States**; or
- **Secure at least 6% of the total votes polled in any four States in the last Lok Sabha** or Assembly elections, and in addition, has a **minimum of four of its members elected to the Lok Sabha; or**
- Wins **at least 2% of seats in the Lok Sabha from not less than three States**.
- The **Symbols Order of 1968 was amended in 2016 to give parties one additional "pass over".**
- According to the amendment, which is in force since January 1, 2014, if a **national or State party fails to meet the eligibility rules in the next general election**s (i.e. 2014 Lok Sabha polls) or the Assembly election after the election in which it was recognised, the **party shall remain to be recognised as a national or State party, i.e. it will not be stripped of its status.**
- However, **whether it will continue to be recognised after any subsequent election would again have to be determined by the eligibility criteria.**

**Criteria to be recognised as a "State party"**

- A party has to **secure at least 6% of the valid votes polled and two seats in Assembly polls or one in Lok Sabha polls**; or
- At a General Election or Legislative Assembly election, **the party must have won at least 3% of the seats in the legislative assembly of the State** (subject to a minimum of 3 seats); or
- At a Lok Sabha General Elections, the **party must have won at least one Lok Sabha seat for every 25 Lok Sabha seats allotted for the State;** or
- At a General Election to the Lok Sabha or the Legislative Assembly, the **party must have at least 8% of the total valid votes polled.**

## 23. Mercy plea decisions and Delays

**Concept :**

- While asking states/appropriate authorities to decide on mercy petitions at the earliest, the **Supreme Court has mentioned that inordinate delay in not deciding on mercy pleas will "frustrate the object and purpose of the death sentence."**

**What is the Case?**

- The apex court has highlighted that death row convicts were taking advantage of an inordinate delay in deciding mercy petitions.
- The efforts shall be made by the state government and/or the concerned authorities to see that the mercy petitions are decided and disposed of at the earliest, so that even the accused can also know his fate and even justice is also done to the victim.
- The court while directing the states also relied on the SC ruling on Jagdish vs. State of Madhya Pradesh wherein the court commuted the death sentence to life imprisonment after taking into consideration the delay in disposal of the mercy petition of above five years.

**Mercy petition**

- The mercy petition talks about the power to pardon the convict under a few sections of the criminal code of procedure.
- Mercy Petition lies in saving an innocent person from being punished due to miscarriage of justice or in cases of doubtful conviction.

**Constitutional backing:**

- Under **Article 72 of the Constitution**, the President has the power to grant pardons and decide on mercy petitions.
- Under **Article 161 of the Indian Constitution**, the Governor of State also possess the power to grant pardons, reprieves, respites and remission or suspend, remit or commute the sentence of a convict against state law.

**Procedure to apply for mercy petition:**

- A convict under the sentence of death is allowed to file a mercy petition within a period of seven days after the date on which the Superintendent of Jail informs him about the dismissal of the appeal or special leave to appeal by the Supreme Court.
- The petitions are to be **presented to the President of India**. The President office seeks the cabinet advice.
- The **appeal is examined by the Ministry of Home Affairs** and the Ministry before giving recommendations to the President, takes the view of State concerned.
- There is **no written procedure to deal with mercy petition**.

**Judicial review:**

- President's pardon/rejection/delay is also subjected to judicial review.
- However, if a court finds that the process of the decision taken by the President under Article 72 was not arbitrary or unreasonable; the decision then cannot be interfered with.
- A **curative petition is the last judicial corrective measure** which can be pleaded in any judgment or decision passed by the Supreme Court which is normally decided by Judges in-chamber.

**Who else can give pardon?**

- In Dhananjoy Chatterjee alias Dhana v State of West Bengal, 1994 case the Supreme Court has said that "The power under Articles 72 and 161 of the Constitution can be exercised by the Central and State Governments, not by the President or Governor on their own".
- The advice of the appropriate Government binds the Head of the state.

## 24. MHA cancels OCI status of actor

**Concept :**

- The **Union Home Ministry has cancelled the Overseas Citizen of India (OCI) card** issued to Kannada actor Chetan A Kumar for "anti-India activities". as per the notice, issued by **Foreigners Regional Registration Office** (FRRO).

**Overseas Citizen of India**

- In 2000, the **Union Ministry of External Affairs** under the **Chairmanship of L.M. Singhvi set up a High-Level Committee on the Indian Diaspora.**
- The Committee was asked to make a comprehensive study of the global Indian Diaspora and to recommend measures for a constructive relationship with them.
- The committee recommended the amendment of the Citizenship Act (1955) to provide for the grant of dual citizenship to Persons of Indian Origin (PIOs) belonging to certain specified countries.

- The **Citizenship (Amendment) Act 2003, made provision for the acquisition of Overseas Citizenship of India (OCI**) by the PIOs of 16 specified countries other than Pakistan and Bangladesh.
- The **Citizenship (Amendment) Act 2005 expanded the scope of the grant of OCI for PIOs of all countries except Pakistan and Bangladesh** as long as their home countries allow dual citizens under their local laws.
- **The OCI is not dual citizenship as the Indian Constitution** under Article 9 forbids dual citizenship or dual nationality.
- The **Citizenship (Amendment) Act, 2015**, has introduced a new scheme called "**Overseas Citizen of India Cardholder**" by **merging the PIO card scheme and the OCI card scheme.**

## Why the OCI and PIO merged?

- The PIO card scheme was introduced in 2002 and thereafter the OCI card scheme was introduced in 2005. Both the schemes were running in parallel even though the OCI card scheme had become more popular.
- This was causing unnecessary confusion in the minds of applicants. The government accepted the problems being faced by applicants and to provide enhanced facilities to them, the Indian Government formulated one single scheme after merging the PIO and OCI schemes, containing positive attributes of both.
- For achieving the above objective, the Citizenship (Amendment) Act, of 2015, was enacted.
- The Citizenship (Amendment) Act, of 2015, replaced the nomenclature of "Overseas Citizen of India" with that of "Overseas Citizen of India Cardholder".

## Rights of Overseas Citizens of India Cardholder

- An overseas citizen of India cardholder shall be entitled to such rights, as the Central Government may specify.
- An **overseas citizen of India cardholder shall not be entitled to the following rights** (which are conferred on a citizen of India);
- He shall not be entitled to the right to equality of opportunity in matters of public employment.
- He shall not be eligible for election as President.
- He shall not be eligible for election as Vice-President.
- He shall not be eligible for appointment as a Judge of the Supreme Court.
- He shall not be eligible for appointment as a Judge of the High Court.
- He shall not be entitled to register as a voter.
- He shall not be eligible for being a member of the House of the People or the Council of States.
- He shall not be eligible for being a member of the State Legislative Assembly or the State Legislative Council.
- He shall not be eligible for appointment to public services and posts in connection with affairs of the Union or of any State except for appointment in such services and posts as the Central Government may specify.

## Renunciation of Overseas Citizen of India Card

- If any overseas citizen of India cardholder makes a declaration renouncing the Card registering him as an overseas citizen of India cardholder, the declaration shall be registered by the Central Government, and upon such registration, that person shall cease to be an overseas citizen of India cardholder.
- Where a person ceases to be an overseas citizen of India cardholder, the spouse of foreign origin of that person, who has obtained an overseas citizen of India card and every minor child of that person registered as an overseas citizen of India cardholder shall subsequently cease to be an overseas citizen of India cardholder.

## Cancellation of Registration as an Overseas Citizen of India Cardholder

- The Union Government may cancel the registration of a person as an overseas citizen of India cardholder if it is satisfied that;
- The registration as an overseas citizen of India cardholder was obtained through fraud, false representation or the concealment of any material fact; or
- The overseas citizen of India cardholder has shown disaffection towards the Constitution of India; or
- The overseas citizen of India cardholder has, during any war in which India may be engaged, unlawfully traded or communicated with an enemy; or
- The overseas citizen of India cardholder has, within five years after registration, been sentenced to imprisonment for a term of not less than two years; or
- It is necessary so to do in the interests of the sovereignty and integrity of India, the security of India, friendly relations of India with any foreign country, or in the interests of the general public.

## 25. Collecting voice samples to aid investigation: process and legality

### Context:

- Congress Leader Jagdish Tytler has appeared before the CBI to submit samples of his voice as part of the investigation into his alleged role in three murders in Delhi's Pul Bangash area by a mob during the anti-Sikh violence of 1984.

### How is a voice sample taken?

- The sample is **collected under controlled circumstances,** following specific procedures.

- A voice sample is generally **taken in an echo-proof room** for a controlled and **noise free environment** and a voice recorder is used.
- The subject is **asked to say a small part of the original statement** that is already part of the evidence, and **both vowels and consonants** in the spoken sample are analyzed.
- Certain **technical parameters** are kept in mind while **collecting the voice sample**. A **spectral analysis of the audio speech** is undertaken where the **pitch, energy, and frequency of the voice are kept** as the base to study and match with the original audio sample
- There are two ways in which a comparison is made
- Firstly, The **semi-automatic spectrographic** method" of voice sampling — that **uses an instrument that converts speech signals into a visual display** — while some other countries use the **"automatic method"** where a **likelihood ratio of the voice samples is developed**, which increases accuracy

**Legality to collect voice samples of a suspect or accused**

- India's **criminal procedure laws do not contain a specific provision** for testing voice samples because it is a relatively new technological tool.
- **Section 53** of the **Code of Criminal Procedure (CrPC), 1973**, allows examination of accused by a medical practitioner at the request of a police officer.
- The word **"examination"** includes the **examination of blood, blood stains, semen, swabs in case of sexual offenses, sputum and sweat, hair samples and fingernail clippings** by the use of modern and scientific techniques including **DNA profiling** and such other tests which the registered medical practitioner thinks necessary in a particular case".
- The phrase **"such other tests"** is read to **include the collection of voice samples**.
- In a **2013** case, the **Supreme Court** considered **whether compelling an accused** to give his **voice sample in the course of an investigation** would be **violative of the fundamental** right against **self-incrimination** or the **right to privacy.** While delivering a **Split Verdict** in the case, the **SC acknowledged that there is no specific law** for collection of voice samples
- In a ruling on **March 30, 2022**, the **Punjab and Haryana High Court** observed that **voice samples** in a sense resemble fingerprints and handwriting, each person has a distinctive voice with characteristic features. The **sample taken itself would not be an evidence, rather they are for comparing the evidence already collected.**"

**26. Fake Encounters**

**Context:**

- The latest cases of fake encounters in Uttar Pradesh.

**What is Extra Judicial Killing:**

- Extrajudicial killings are **acts of violence carried out by law enforcement agencies** without **any judicial authorization.**
- This is usually done by the state **to enforce what may be called 'instant justice'** by circumventing the **elaborate procedure established** through the criminal justice system

**What are the laws dealing with Extrajudicial Killings:**

- There are **no provisions under the Indian law** which **directly authorize** the police officer to **encounter criminals**. However, there is **some enabling provision that can be construed to confer power** on the police officer to use force against a criminal.
- The **Indian Penal Code, 1860**
  - The law relating to the **right of private defense** is contained in **Section 96 to 106 of the Indian Penal Code (IPC), 1860.**
  - **Section 96 of the IPC** declares that any act done in exercise of 'right of private defense' is **not an offense**. **Section 97 states** the **defense is available both in respect of 'body' and 'property',** however **Section 99 cautions** that the **defense is not available for inflicting more harm than is necessary for defense.**
  - **Section 100** specifies the **various circumstances (death, grievous hurt, kidnapping, rape, acid attack etc.)** under which a person committing death in exercise of private defense, **will be justified.**
  - Also, it provides an **exception if an encounter is done by the police officer. Exemption 3 of Section 300 state**s that –**Culpable homicide is not murdered** if it is **done by the offender who is a public servant** exercises his right of private defence in good faith and exceeds his power conferred to him by law and causes the death of such person.
- The **Code of Criminal Procedure, 1973** also **permits a police officer to use all means to arrest the accused** if he forcibly resists the endeavour to arrest him or evade such arrest.
- **How fake encounters are Gross violation of Indian Constitution and Principles:**
- Encounter killings violate the fundamental rights of criminals, including the right to life and liberty. The **right to life and liberty can only be deprived** through the **procedure established by law, as guaranteed by Article 21** of the Indian Constitution.

- This right **extends to all individuals,** regardless of their actions or criminal record, and ensures a fair investigation and trial process.
- The r**ight to a fair investigation and trial process** safeguards the principle of equality before the law, as enshrined in **Article 14.**
- An accused person has a **fundamental right to have a lawyer** of their choice for their defence, as guaranteed by **Article 22** of the Indian Constitution and **Section 303 of the Criminal Procedure Code.**
- In fake encounters, the **police assume the role of the judiciary** without providing a proper opportunity for the accused to be heard in an appropriate judicial forum. This violates the **principle of Audi alteram partem,** which ensures that **both parties have a fair and reasonable opportunity** to be heard.
- Encounter killings not **only violate the fundamental rights of criminals but also threaten the principles of justice and the rule of law** in India.

**What are the Supreme Court Guidelines in fake encounters?**

- In **2014, PUCL vs State of Maharashtra case** the Supreme Court of India **issued a set of guidelines** for the investigation of encounter killings, also known as "**fake encounters."**
- The Supreme Court then **laid down the following 16 point guidelines** as the **standard procedure** to be followed for thorough, effective, and independent investigation in the cases of death during police encounters:
  - **Record Tip-off:** Whenever the police receives any intelligence or tip-off regarding criminal activities pertaining to the commission of a grave criminal offence, it **must be recorded** either **in writing or electronic form.** Such recordings need **not reveal details** of the suspect or the location to which the party is headed.
  - **Register FIR:** If in **pursuance to a tip-off**, the police uses firearms and this results in the death of a person, then an **FIR initiating proper criminal investigation must be registered** and be forwarded to the Court without any delay.
  - **Independent Probe:** Investigation into such death must be done by an **independent CID team or a police team** of another police station under the supervision of a senior officer. It has to **fulfill eight minimum investigation requirements like, identify the victim, recover and preserve evidentiary material, identify scene witnesses, etc.**
  - **Magisterial Probe:** Mandatory magisterial inquiry **into all cases of encounter deaths must be held** and a report thereof must be sent to the Judicial Magistrate.
  - **Inform NHRC:** The **NHRC or State Human Rights Commission (as the case may be) must be immediately informed** of the encounter death.
  - **Medical Aid:** It must be **provided to the injured victim/criminal and a Magistrate or Medical Officer** must record his statement along with the Certificate of Fitness.
  - **No Delay:** Ensure forwarding FIR, **panchnamas, sketch, and police diary entries to the concerned Court without any delay.**
  - **Send Report to Court:** After **full investigation into the incident, a report must be sent to the competent Court** ensuring expeditious trial.
  - **Inform Kin:** In the case of death of an accused criminal, their **next of kin must be informed at the earliest.**
  - **Submit Report:Bi-annual statements of all encounter killings** must be sent to the **NHRC by the DGPs** by a set date in set format.
  - **Prompt Action:** Amounting to an offense under the IPC, **disciplinary action must be initiated against the police officer found guilty** of wrongful encounter and for the time being that officer must be suspended.
  - **Compensation:** The compensation scheme as described under **Section 357-A of the CrPC** must be **applied for granting compensation** to the dependants of the victim.
  - **Surrendering Weapons:** The **concerned police officer(s) must surrender their weapons for forensic and ballistic analysis**, subject to the rights mentioned under **Article 20 of the Constitution.**
  - **Legal Aid to Officer**: An intimation about the incident must be sent to the accused police officer's family, offering **services of lawyer/counselor.**
  - **Promotion: No out-of-turn promotion** or instant gallantry awards shall be bestowed on the officers involved in encounter killings **soon after the occurrence of such events.**
  - **Grievance Redressal:** If the **family of the victim finds that the above procedure has not been followed,** then it may **make a complaint to the Sessions Judge having territorial jurisdiction** over the place of incident. The concerned Sessions Judge must look into the merits of the complaint and address the grievances raised therein.

**What are the Current International position:**

- It must be noted that **India** has **not ratified the UN Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (UNCAT) of 1987**.
- The main concern of the convention is the **violation of rights and lack of transparency as overstepping on the function of the judiciary** is fatal.

Further, even **Article-6 of The International Covenant on Civil and Political Rights**, to which **India is a party**, states that "**every human being has the inherent right to life and this right shall be protected by law. No one shall be arbitrarily deprived of his life."**

## 27. Same-sex marriage's legal recognition in India

**Concept :**

- The Supreme Court has set up a five-judge Constitution bench to hear the batch of petitions seeking legal recognition of same-sex marriages in India.
- The bench set up by Chief Justice of India (CJI) DY Chandrachud also includes Justices Sanjay Kishan Kaul, Ravindra Bhat, Hima Kohli, and PS Narasimha.

**What is the case?**

- The Court has been hearing multiple petitioners' requests for legal recognition of same-sex marriages under a special law.
- SC took up the case as petitioners claimed that **the non-recognition of same-sex marriage amounted to discrimination t**hat strikes at the root of dignity and self-fulfilment of LGBTQIA+ couples.
- The **petitioners cited the Special Marriage Act, 1954** and appealed to the Court to extend the right to the LGBTQIA+ community, **by making the marriage between any two persons gender neutral.**
- **Special Marriage Act, 1954 provides a civil marriage for couples who cannot marry under their personal law.**

**Why does the community want this right?**

- Even if LGBTQIA+ couples may live together, legally, they are on a slippery slope.
- In Navtej Singh Johar case (2018) **homosexuality was decriminalised**.
- They **do not enjoy the rights married couples do.**
- For example, LGBTQIA+ couples **cannot adopt children or have a child by surrogacy**;
- They **do not have automatic rights to inheritance, maintenance** and **tax benefits**;
- After a partner passes away, they **cannot avail of benefits like pension or compensation.**
- Most of all, since marriage is a social institution – that is created by and highly regulated by law – without this social sanction, same-sex couples struggle to make a life together.

**What is the Centre's stand?**

- At depositions in courts and outside, the **Centre has opposed same-sex marriage.**
- It said that the judicial interference will cause complete havoc with the delicate balance of personal laws.
- While filing a counter-affidavit during this hearing, the **government said that decriminalisation of Section 377 IPC does not give rise to a claim to seek recognition for same-sex marriage.**

**Arguments forwarded by the Government**

- **Notion of marriage :**
  - The notion of marriage itself necessarily and inevitably presupposes a union between two persons of the opposite sex.
  - This definition is socially, culturally and legally ingrained into the very idea and concept of marriage and ought not to be disturbed or diluted by judicial interpretation.
- **Marriage laws governed by the personal laws/codified laws :**
  - Parliament has designed and framed the marriage laws in the country to recognise only the union of a man and a woman to be capable of legal sanction, and thereby claim legal and statutory rights and consequences.
  - Marriage laws in India are mostly **governed by the personal laws/codified laws relatable to customs of various religious communities.**
  - Any interference with the same would cause a complete havoc with the delicate balance of personal laws and in accepted societal values.
- **Reasonable restriction :**
  - Even if such a right is claimed under Article 21, the right can be curtailed by competent legislature on permissible constitutional grounds including legitimate state interest.

**Special Marriage Act, 1954**

- Marriages in India can be registered under the respective personal laws Hindu Marriage Act, 1955, Muslim Marriage Act, 1954, or under the Special Marriage Act, 1954.
- The **Special Marriage Act, 1954 is an Act of the Parliament of India** with provision for **civil marriage for people of India and all Indian nationals** in **foreign countries, irrespective of religion or faith followed by either party.**
- When a person solemnized marriage under this law, then the marriage is not governed by personal laws but by the Special Marriage Act.

## 28. Govt should immediately conduct a caste census

**Concept** :

- Congress president Mallikarjun Kharge on wrote a letter to Prime Minister Narendra Modi **demanding that census be conducted "immediately"**.
- The **decennial census was to be carried out in 2021** but was delayed due to the Covid-19 pandemic.
- Kharge also said that a "**comprehensive**" **caste census should be made a part of the census.**

**First Caste Census as SECC (Socio-Economic and Caste Census):**

- SECC was conducted for the first time in 1931.
- SECC is **meant to canvass every Indian family**, **both in rural and urban India**, and ask about their:
- Economic status, so as to allow Central and State authorities to come up with a range of indicators of deprivation, permutations, and combinations of which could be used by each authority to define a poor or deprived person.
- It is also meant to ask every person their specific caste name to allow the government to re-evaluate which caste groups were economically worst off and which were better off.
- SECC has the potential to allow for a mapping of inequalities at a broader level.

**SECC 2011**

- The Socio-Economic Caste Census of 2011 was a major **exercise to obtain data about the socio-economic status of various communities.**
- It **had two components**: a **survey of the rural and urban households** and **ranking of these households** based on pre-set parameters, and a caste census.
- However, only the details of the economic conditions of the people in rural and urban households were released. The caste data has not been released till now.

**Difference Between Census & SECC:**

- The **Census provides** a **portrait of the Indian population**, while the **SECC is a tool to identify beneficiaries of state support.**
- Since the **Census falls under the Census Act of 1948**, all data are considered confidential, whereas according to the SECC website, "all the personal information given in the SECC is open for use by Government departments to grant and/or restrict benefits to households."

**29. Ninth schedule of constitution**

**Concept :**

- Chhattisgarh Chief Minister Bhupesh Baghel wrote to Prime Minister Narendra Modi seeking the inclusion of two amendment Bills allowing for higher quota in jobs and educational institutions, in the Ninth Schedule of the Constitution.
- In Chhattisgarh's case, the two amendment Bills — that pave the way for 76% quota for Scheduled Caste, Scheduled Tribes and Other Backward Classes — were passed unanimously by the State Assembly last December, but are yet to receive the Governor's nod.

**Ninth Schedule**

- The Schedule **contains a list of central and state laws** which cannot be challenged in courts and was **added by the Constitution (First Amendment) Act, 1951**.
- The **first Amendment added 13 laws to the Schedule**. Subsequent amendments in various years have taken the number of protected laws to 284 currently.
- It was **created by the new Article 31B, which along with Article 31A was brought in by the government to protect laws related to agrarian reform** and for **abolishing the Zamindari system.**
- While **Article 31A extends protection to 'classes' of laws, Article 31B shields specific laws or enactments.**
- While most of the laws protected under the Schedule concern agriculture/land issues, the **list includes other subjects.**
- **Article 31B also has a retrospective operation** which means that if laws are inserted in the Ninth Schedule after they are declared unconstitutional, they are considered to have been in the Schedule since their commencement, and thus valid.
- **Although Article 31B excludes judicial review, the apex court has said in the past that even laws under the Ninth Schedule would be open to scrutiny** if they violated Fundamental Rights or the basic structure of the Constitution.

**Are Laws in the Ninth Schedule completely Exempt from Judicial Scrutiny**?

- **Keshavananda Bharati v. State of Kerala (1973)**: The court upheld the judgement in Golaknath and introduced a new concept of "Basic structure of the Indian Constitution" and stated that, "all provisions of the constitution can be amended but those amendments which will abrogate or take away the essence or basic structure of constitution which included Fundamental Rights are fit to be struck down by the court".
- **Waman Rao v. Union of India (1981)**: In this important judgement, the SC ruled that, "those amendments which were made in the constitution **before 24th April 1973** (date on which judgement in Keshavananda Bharati was delivered**) are valid** and constitutional **but those which were made after the stated date are open to being challenged on the ground of constitutionality.**

- **I R Coelho v. State of Tamil Nadu (2007)**: It was held that **every law must be tested under Article 14, 19 and 21 if it came into force after 24th April 1973.**
- In addition, the court upheld its previous rulings and declared that any act can be challenged and is open to scrutiny by the judiciary if it is not in consonance with the basic structure of the constitution.
- In addition, it was held that if the constitutional validity of any law under the ninth schedule has been upheld before, in future it cannot be challenged again.

## 30. Same sex couples' right to marry'

**Context:**

- A five-judge bench of the Supreme Court, headed by Chief Justice of India D Y Chandrachud, began hearing a batch of petitions seeking legal recognition of same sex marriage.

**More about the news:**

- A **five-judge bench** of the **Supreme Court, headed by Chief Justice of India D Y Chandrachud**, began hearing a batch of petitions seeking legal recognition of same sex marriage.
- The **Centre argued** against the **petitions and questioned the judiciary's right to confer legal recognition** on the socio-legal institution of marriage.
- However, the **apex court clarified** that the **hearing's scope would be limited to developing a notion of a civil union** that **finds legal recognition under the Special Marriage Act.**

**What is civil union:**

- A **civil union under the Special Marriage Act** is a **legally recognized union** between **two individuals,** regardless of their caste, religion, or nationality.
- It also **refers to the legal status** that **allows same-sex couples specific rights and responsibilities** normally conferred upon married couples.
- This type of union **allows couples to have a formal, legally binding relationship without going through the traditional rituals and customs** of a religious or cultural marriage ceremony.
- Although a **civil union resembles a marriage and brings with it employment, inheritance, property, and parental rights**, there are some differences between the two.
- **How is a civil union different from marriage:**
- A civil union is a **legal agreement** between **two individuals that provides them with some of the rights and benefits** of a marriage, **such as inheritance rights, tax benefits, and access to healthcare.**
- However, it is **different from a marriage** in several ways:
    - **Religious or cultural beliefs do not play a role in a civil union**, whereas they often do in a marriage.
    - In some countries, **civil unions are only available to same-sex couples,** whereas **marriage is available to both same-sex and opposite-sex couples.**
    - A civil union **may not be recognized by all states** or countries, whereas a marriage is generally recognized worldwide.
    - There may be **differences in the legal requirements** and **procedures for entering into a civil union versus a marriage.** It may be different in terms of social and cultural significance and legal recognition.

**Which other countries allow civil unions:**

- The **United States** allows **same sex unions.**
- **Before 2009,** the year that **Sweden legalised same sex marriages,** LGBTQ couples there could apply for civil unions and enjoy different benefits.
- **From 1993,** couples in **Norway enjoyed the right to enter into civil unions**, which gave way to a new law 15 years later. This allowed s**uch couples to marry, adopt and undergo state-sponsored artificial insemination.**

Similarly, countries like **Brazil, Uruguay, Andorra, and Chile had also recognised the right of same sex couples** to enter into civil unions, even before they formally recognised their legal right to marriage.**.**

## 31. Nagaland's Municipal Tightrope

**Concept :**

- Due to the pressure from the Supreme Court, the current Nagaland government after consulting various stakeholders such as churches, NGOs, and tribal bodies, established the ground for conducting elections in March 2022.
- The State Election Commission March notified the election dates.
- However, the tribal hohos and various civil society organisations opposed the move and cautioned the government that they would boycott the polls until the Municipal Act which extends reservations for women is reviewed and rewritten as per the will of the Naga people.
- Due to public pressure, the government has repealed the Municipal Act as the people "cannot be compelled" to participate in the elections.

**Background**

- The Nagaland government decided to be in **contempt of the Supreme Court rather than going against the community-based organisations** and **facing their wrath by repealing the Nagaland Municipal Act of 2001.**
- The move led to the **cancellation of the State Election Commission's notification for conducting the Urban Local Bodies (ULBs) elections in Nagaland with 33% of the seats being reserved for women.**
- However, the Supreme Court has stayed the notification cancelling the ULB elections body polls.
- Further, in the Legislative Assembly elections held in 2023, two women were elected to power for the very first time in Nagaland.

**Opposition to ULB polls**

- **Nagaland is said to be the only State in the country where Urban Local Bodies seats are not reserved for women** which are mandated under clause IV of the 74th Constitutional Amendment Act of 1992.
- The key **reason for not extending the reservation to women is that several traditional tribal and urban organisations have opposed the 33% reservation** of seats for women.
- These organisations believe that **such reservations would violate the special provisions extended to Nagaland through Article 371A of the Constitution.**
- According to **Article 371A, no Act of Parliament would apply to the religious or social practices of the Nagas, their customary laws, administration of civil and criminal justice, and ownership and transfer of land and resources.**
- Apex tribal hohos (bodies) argue that women have not been part of decision-making bodies as per their customs and traditions.
- The **first and only ULB elections in the State were held in 2004 without reservation for women.**
- In 2006, the State government amended the Municipal Act of 2001 to extend 33% reservation for women as mandated by the 74th Constitutional Amendment.
- This led to widespread opposition from local organisations which forced the government to postpone the ULB polls in 2009.
- Again in 2012, efforts to conduct the elections were met with strong protests.
- Later in September 2012, the State government enacted a resolution to exempt Nagaland from Article 243T of the Constitution which mandates the reservation for women in ULB elections.
- The **resolution to exempt the state from Article 243T was revoked in 2016 and elections with 33% reservation were notified**.
- This notification resulted in widespread protests and large-scale violence and the government declared the process to conduct the election null and void in February 2017.

**Article 371A of Indian Constitution**

- Article 371A of the Indian Constitution is a **special provision made for the state of Nagaland.**
- It was introduced by the **13th Amendment to the Constitution of India in 1962.**
- The main objective of Article 371A is to **provide special safeguards for the protection of the unique social and cultural practices, customs and traditions of the Naga people, who have a distinct identity and history.**
- The provision also aims to promote the equitable development of the state of Nagaland.

**Important provisions of Article 371A:**

- The **Governor of Nagaland has special responsibility to ensure the development of the state with respect to law and order, and administration of justice**.
- The **Governor must be consulted on all matters** concerning the appointment of civil servants and the selection of candidates for admission to educational institutions in Nagaland.
- The **state legislature of Nagaland has the power to enact laws relating to the ownership and transfer of land and its resources, customary law and practice of the Naga tribes.**
- The **provision prohibits the Parliament of India from enacting any law that affects the religious or social practices of the Naga people,** their customary law and procedures, or ownership and transfer of land and its resources in Nagaland.
- Overall, Article 371A recognizes the unique history, culture, and identity of the Naga people and provides special protections to ensure their equitable development while preserving their traditions and customs.

**32. Delay in 2021 Census by at least 3 years**

**Context:**

- The country's **Census enumeration** that was scheduled to take place in 2021 has been **pushed to 2024-25** until further orders.

**More about Census 2021**

- It will be the **15th Indian Census**.
- It will be conducted in **two phases, house listing and population enumeration.**

- It will also provide a **facility to the public for self-enumeration**.
- For the **first time, the Census 2021** will use the **Mobile App for data collection.**
- Apart from allowing the provision of online self-enumeration, home visit by the enumerators for collecting census data will continue as in the past.

**More facts about Census 2021:**

- The Census is the enumeration of the population of the country and it is being conducted at an **interval of 10 years.**
- It was **first** started under **British Viceroy Lord Mayo in 1872.**
- The **first synchronous census** in India was held in **1881.**
- The **Census Act of 1948** ensures **confidentiality for census data.** The information recorded for the population census is so private that **even the legal system cannot access** it.
- The **responsibility** of conducting the **decennial Census** rests with the **Office of the Registrar General and Census Commissioner,** India under the **Ministry of Home Affairs, Government of India.**
- In the Census, data is collected on demographic and various socio-economic parameters like education, SC/ST, religion, language, marriage, fertility, disability, occupation and migration of the individuals.

**2011** marks the **first time biometric information** was collected.

## 33. Additional Judges

**Concept :**

- The Supreme Court collegium has recommended the names of six additional judges of the Punjab and Haryana High Court for appointment as permanent judges.
- The additional judges are Justices Vikas Bahl, Vikas Suri, Sandeep Moudgil, Vinod Sharma (Bhardwaj), Pankaj Jain and Jasjit Singh Bedi.
- The collegium, headed by Chief Justice DY Chandrachud, said that **since the current two-year term of one of the additional judges is due to expire on May 24, the recommendation may be processed expeditiously by the Centre**.

**Constitutional Provisions on Additional Judges:**

- **Additional Judges can be appointed by the President** under **clause (1) of Article 224 of the Constitution.**
- The **State Government should first obtain the sanction of the Central Government** for the creation of such additional posts.
- After the post is sanctioned the procedure to be followed for making the appointment is same as for the appointment of a permanent Judge.
- However, a medical certificate will not be necessary from the person being appointed as an Additional Judge.
- When an Additional Judge is being considered for confirmation as an Additional Judge for a fresh term, the relevant documents must be sent by the Chief Justice of the High Court concerned along with such recommendation.
- However, the **Chief Justice of the High Court should not make a recommendation for appointment of an Additional Judge when a vacancy of a permanent Judge is available in that High Court.**

**Conditions for Appointment :**

- If **there is any temporary increase in the business of the High Cour**t or by reason of arrears of work, and the
- If **President feels that the number of the Judges of that Court should be for the time being increased**, then he may appoint duly qualified persons to be additional Judges of the Court.
- The period of **such service must not exceed two years**.
- **No additional Judge of a High Court shall hold office after attaining the age of sixty-two years**.

## 34. SC Slams sections of Special Marriage Act

**Concept :**

- The Supreme Court said **provisions of the Special Marriage Act which mandate a 30 day notice of intent to marry is steeped in patriarchy and expose vulnerable couples to an "invasion" by society.**

**Sections of the act**

- **Section 5** of the SMA requires couples getting married under it to give a notice to the Marriage Officer 30 days before the date of marriage**.**
- **Section 6** requires such a notice to be then entered into the Marriage Notice Book maintained by the Marriage Officer, which can be inspected by "any person desirous of inspecting the same.
- **Section 7** provides the process for making an objection.
- **Section 8** specifies the inquiry procedure to be followed after an objection has been submitted.
- These **provisions seriously damage one's right to have control over her/his personal information and its accessibility.**

- By making the personal details of the couple accessible to everyone, the very right of the couple to be the decision makers of their marriage is being hampered by the state.
- These public notices have been used by anti-social elements to harass couples getting married.
- There have been instances where marriage officers have gone over and beyond the law and sent such notices to the parents of the couple leading to the girl being confined to her house by her parents.

## Special Marriage Act (SMA), 1954

- Marriages in India can be registered under the **respective personal laws Hindu Marriage Act, 1955, Muslim Marriage Act, 1954, or under the Special Marriage Act, 1954.**
- It is the duty of the Judiciary to ensure that the rights of both the husband and wife are protected.
- The **Special Marriage Act, 1954 is an Act of the Parliament of India with provision for civil marriage for people of India and all Indian nationals in foreign countries, irrespective of religion or faith followed by either party.**
- When a person solemnises marriage under this law, then the marriage is not governed by personal laws but by the Special Marriage Act.

## Features:

- Allows people from two different religious backgrounds to come together in the bond of marriage.
- Lays down the procedure for both solemnization and registration of marriage, where either of the husband or wife or both are not Hindus, Buddhists, Jains, or Sikhs.
- Being a secular Act, it plays a key role in liberating individuals from traditional requirements of marriage.

## Provisions:

- **Prior notice:**
- As per Section 5 of the Act Couples have to serve a notice with the relevant documents to the Marriage Officer 30 days before the intended date of marriage.
- **Registration:**
- Both parties are required to be present after the submission of documents for issuance of public notice inviting objections.
- Registration is done 30 days after the date of notice after deciding any objection that may have been received during that period by the SDM.
- Both parties along with three witnesses are required to be present on the date of registration.

## 35. TN assembly amends factories act 1948

### Concept :

- Tamil Nadu Assembly passed an amendment to the Factories Act, 1948, to enable exemption to industries from the present norms on maximum work hours, holidays and overtime wages as defined in the Act.
- According to the amendment, the exemption can be provided by the government through a notification to "any factory or a group or class or description of factories" for certain period, subject to any conditions or restrictions mentioned in the notification.
- This exemption will mean some industries can enable their workers to work longer hour.

### Factories Act 1948:

- The Factories Act, 1948 , as amended by the Factories (Amendment) Act, 1987, serves to assist in **formulating national policies in India with respect to occupational safety and health in factories and docks in India**.
- It deals with various problems concerning **safety, health, efficiency and well-being of the persons at work places.**

### Salient features of Factories Act, 1948

- The word "factory" has been expanded by the Factories (Amendment) Act of 1976 to include contract labour when determining whether a factory has a maximum of 10 or 20 employees.
- The Act increased the minimum age for children to work in workplaces from 12 to 14 and reduced their daily working hours from 5 to 4 and a half.
- The Act forbids women and children from working in factories from 7 p.m. to 6 a.m.
- The difference between a seasonal and non-seasonal factory has been abolished by the Act.
- The Act, which has **provisions for factory registration and licencing**.
- The **state government is required to make sure that all factories are registered and also have valid licences** that are renewed from time to time.
- The Act gives **state governments the authority to enact rules and regulations** that ask for management and employee association for the benefit of employees.
- The **state government has the authority to apply the Act's requirements to any establishment, regardless of the number of employees** inside and regardless of whether the establishment engages in manufacturing operations.

- In Rabindra Agarwal v. State of Jharkhand (2010), the **Jharkhand High Court held that the Factories Act, special legislation would prevail over the Indian Penal Code.**

**Application of the Factories Act,1948**

- The **Act also applies to the whole country of India**, and **covers all manufacturing processes and premises that fall under the definition of a factory** as defined in Section 2(m) of the Act.
- It also **applies to factories owned by the central or state governments**, as defined in Section 116 of the Act.
- The Act is applied and limited to factories that use power and employ 10 or more people on any working day in the preceding 12 months.
- The Act is applied and limited to factories that do not use power and employ 20 or more people on any working day in the preceding 12 months.
- The Act is also covered under Section 85 of the Factories Act by the state governments or Union Territories.

**36. EC should keep political parties in loop about defective VVPATs: Congress**

**Context**: The Congress slammed the Election Commission (EC) for not keeping political parties in loop as reports emerge that the EC has identified 6.5 lakh Voter Verified Paper Audit Trail (VVPAT) machines as defective.

**Concept:**

- The Voter Verifiable Paper Audit Trail (VVPAT) is a method of providing feedback to voters using a ballot less voting system.
- The VVPAT is an independent printer system attached with Electronic Voting Machine (EVM) that allows the voters to verify that their votes are cast as intended.
- It generates a paper slip every time a voter casts his vote, recording the party to whom the vote was made. The VVPAT slip is kept in a sealed cover.
- VVPAT slip counting takes place in the VVPAT counting booths under the close monitoring of the returning officer and direct oversight of the observer.

**How does the VVPAT work?**

- The voting in India is done using the Electronic Voting Machine (EVM) that is designed with two units: the control unit and the balloting unit.
- The balloting unit of the machine has a list of candidate names and party symbols with a blue button next to it. The voter can press the button next to the candidate's name they wish to vote for.
- When the voter casts the vote on the EVM, printer-like VVPAT apparatus linked to the EVM generates a slip showing serial number, name and symbol of the candidate to whom the vote was made.
- With this slip, the voter can verify his casted vote.
- This VVPAT slip is displayed for 7 seconds before it's automatically cut.
- The slip, once viewed, is cut and dropped into the drop box in the VVPAT machine and a beep will be heard.
- The VVPAT machines can only be accessed by the election officers in the rarest of rare cases.

**37. How can a juvenile be tried as an adult in Court?**

**Concept :**

- The National Commission for Protection of Children (NCPCR) has recently issued **guidelines for conducting a preliminary assessment by the Juvenile Justice Board (JJB) under Section 15 of the Juvenile Justice Act, 2015 (JJ Act, 2015)**

**Key Details**

- This preliminary assessment is to **ascertain whether a juvenile can be tried as an adult.**
- The **2015 Act, for the first time, provided for trying juveniles in the age group of 16-18 as adults in cases of heinous offences.**
- The sole objective of having such a preliminary assessment is to determine whether a child within the age group of 16-18 years should be tried as an adult in case of heinous offences.

**How does a child get tried as adult?**

- The Act has categorised the offences committed by children into three categories:
- petty offences,
- serious offences, and
- heinous offences.
- The **JJ Act provides that in case of a heinous offence alleged to have been committed by a child, who has completed or is above the age of sixteen years**, the Board shall conduct a preliminary assessment regarding:
- his mental and physical capacity to commit such offence,
- ability to understand the consequences of the offence and

- the circumstances in which he allegedly committed the offence.
- If the Board, **after preliminary assessment passes an order that there is a need for trial of the said child as an adult**, then the **Board may order the transfer of the case to the Children's Court having jurisdiction to try such offences.**

## Responsibilities of the Board

- The **Juvenile Justice Board (JJB) shall be responsible for the preliminary assessment.**
- In case the JJB does not have at least one member who is a practising professional with a degree in child psychology or child psychiatry, the Board shall take the assistance of psychologists or experts who have the experience of working with children in difficult times.
- The child should also be provided with a legal aid counsel through the District Legal Services Authority who shall be present during the preliminary assessment.
- The Act mandates experts, who have the required qualification to assist the JJB, to undergo training.
- During the preliminary assessment, the Board and experts shall also analyse and take into consideration the Social Investigation Report (SIR) or a Social Background Report (SBR) to be prepared after interaction with the child or child's family.
- It will be prepared by the Probation officer or Child Welfare Officer or any social worker.

## The Juvenile Justice (Care and Protection of Children Act) 2015

- The Juvenile Justice (Care and Protection of Children) Act was introduced and passed in Parliament in 2015 to replace the Juvenile Delinquency Law and the Juvenile Justice (Care and Protection of Children Act) 2000.
- **Main Provisions:**
- Allowing the **trial of juveniles in conflict with law in the age group of 16-18 years as adults,** in cases where the crimes were to be determined.
- The nature of the crime, and whether the juvenile should be tried as a minor or a child, was to be **determined by a Juvenile Justice Board.**
- Another major provision was with **regards to adoption, bringing a more universally acceptable adoption law instead of the Hindu Adoptions and Maintenance Act (1956) and Guardians of the ward Act (1890) which was for Muslims, although the Act did not replace these laws.**
- The Act streamlined adoption procedures for orphans, abandoned and surrendered children and the **existing Central Adoption Resource Authority (CARA) has been given the status of a statutory body to enable it to perform its function more effectively**.

## 38. 'Foreign lawyers cannot work here, yet'

### Concept :

- **The Society of Indian Law Firms (SILF) h**as submitted a 20-page **representation to the Bar Council of India (BCI), demanding the repeal of the rule allowing foreign law firms and lawyers to practise international arbitration in India.**
- SILF has expressed concern over the timing of the move and cautioned that it went against the Supreme Court's 2018 judgement.
- SILF wants the BCI to reject all the applications received from foreign lawyers or firms seeking registration in India.

### Areas of Concern

- The Indian legal profession is subject to the overall jurisdiction of the BCI. But if foreign lawyers commit any professional misconduct, the BCI cannot act against them, because they will be governed by the rules of their home jurisdiction.
- Another area of concern is that Indian law firms can't have more than 20 partners. But in **other countries, particularly the UK, rest of Europe, and the US one can even have big corporations**. Now, how can one face this sort of competition, which is creating an unequal playing field.
- Moreover, the law must first be amended.
- The **SC says only Indian citizens can practise law in the country and the practice includes not just litigation but all corporate work, transactional work**. **The SC judgement has been totally ignored in the bar council's regulations.**

### About the new rules

- According to the **Advocates Act**, advocates enrolled with the Bar Council alone are entitled to practise law in India.
- All others, such as a litigant, can appear only with the permission of the court, authority or person before whom the proceedings are pending.
- **Foreign lawyers and law firms can practice in India:**
- The notification **essentially allows foreign lawyers and law firms to register with BCI to practise in India** if they are entitled to practise law in their home countries.
- However, the **foreign lawyers or foreign Law Firms have not been permitted to appear before any courts, tribunals or other statutory or regulatory authorities**.

- They are **allowed to practise transactional work /corporate work such as joint ventures, mergers and acquisitions, intellectual property matters, drafting of contracts and other related matters on a reciprocal basis**.
- **Same restrictions for Indian lawyers working with foreign law firms :**
- Indian lawyers working with foreign law firms will also be subject to the same restriction of engaging only in non-litigious practice.

**Significance**

- According to BCI the move would mutually benefit lawyers from India and abroad and the legal fraternity in India would not experience any disadvantage.
- Further, the latest move is expected to address the concerns over the flow of Foreign Direct Investment (FDI) into the country and would help make India a hub for international commercial arbitration.

**Bar Council of India**

- The Bar Council of India is a **statutory body created by Parliament** under the **Advocates Act, 1961** to regulate and represent the Indian bar.
- It performs the **regulatory function by prescribing standards of professional conduct** and **etiquette and by exercising disciplinary jurisdiction** over the bar.
- It also sets **standards for legal education and grants recognition to Universities** whose degree in law will serve as qualification for enrolment as an advocate.
- In addition, it performs certain representative functions by protecting the rights, privileges and interests of advocates and through the creation of funds for providing financial assistance to organise welfare schemes for them.
- It consists of **members elected from each state bar council**, and the **Attorney General of India and Solicitor General of India who are ex-officio members o**f the bar council.
- The members from the state bar council are **elected for a period of five years.**
- The **Act provided for the constitution of Bar Council of India, State Bar Councils**, their powers, enrolment, qualification, disqualification of Advocates etc.

**State Bar Councils**

- The State Bar Councils are **statutory bodies established under Section 3 of the Advocates Act, 1961.**
- These were **set up as different councils for the states and union territories of India**.
- They **act as regulatory bodies, making rules for the legal profession and education in their respective states** and also act as the representatives of the advocates of that state, thereby acting in their interests.
- The **main functions of the State Bar Councils as specified under Section 6 of the Advocates Act** are to act in the interest of the advocates, to bring in legal reform, to regulate the conduct of advocates, to establish funds and to oversee the Legal Education in the respective states among others.
- They **work in coordination with and under the supervision of the Bar Council of India,** which is a national body established under Section 4 of the Advocates Act, 1961.

**39. Governors should clear bills as soon as possible: SC**

**Concept :**

- The Supreme Court observed that bills sent to the governor for assent must be returned "as soon as possible" and not sit over them, making state Legislative Assemblies wait indefinitely.

**Key-highlights of SC Observation**

- Citing proviso 1 of **Article 200 of the Constitution**, the bench said the expression **'as soon as possible' has significant constitutional intent and must be borne in mind by constitutional authorities.**
- According to Article 200, "Assent to Bills when a Bill has been passed by the Legislative Assembly of a State or, in the case of a State having a Legislative Council, has been passed by both Houses of the Legislature of the State, it shall be presented to the Governor and the **Governor shall declare either that he assents to the Bill or that he withholds assent therefrom or that he reserves the Bill for the consideration of the President."**
- The governor is an **important constitutional figure in India, serving as the representative of the President of India in each state and union territory**.

**Article 200 of the Indian Constitution**

- **Article 200 of the Indian Constitution** provides provisions regarding the powers of the Governor when a bill is passed by the state legislature.
- The Governor shall declare **either that he assents to the Bill or that he withholds assent therefrom or that he reserves the Bill for the consideration of the President**.
- **When a bill other than money bill** is presented before Governor for his assent, he **either gives assent to the bill, withhold his assent to the bill or return the bill for reconsideration of houses.**

- If the bill is **passed again by state legislature with or without amendments, he has to give his assent or reserve the bill for consideration of President. (Article 201** pertains to **'Bills Reserved for Consideration')**
- The **Governor cannot send money bill back for reconsideration** because the money bill would usually be introduced with prior assent of Governor only.
- In case the money bill reserved for Presidents assent, the President has to state whether he is giving assent or withholding his assent.
- The **Constitution does not furnish any guidance to the Governor that in which matters he should accord his assent and in which matters he should withhold assen**
- **Veto Powers of Governor**
- **The Governor of India enjoys absolute veto, suspensive veto (except on money bills) but not the pocket veto.**
- **Absolute Veto:** It refers to the power to withhold his assent to a bill passed by the legislature. The bill then ends and does not become an act.
- **Suspensive Veto**: It is used when the bill is returned to the legislature for its reconsideration.
- If the legislature resends the bill with or without amendment , it has to be approved the bill without using any of the veto powers.
- **Exception:** Money Bill with respect to suspensive veto
- **Pocket Veto:** The bill is kept **pending for an indefinite period**. **This power can be exercised by President, but not by the Governor.**

**Related Articles**

- **Article 355 of the Indian Constitution**, it shall be the duty of the Union to ensure that the government of every State is carried on in accordance with the provisions of the Constitution.
- **According to Article 154 of the Constitution**, the Governor can exercise his/her executive powers only on the "aid and advice of the Council of Ministers".
- Thus, the **Governor can withhold assent to a Bill only on ministerial advice**.

**Key Supreme Court judgments on the issue of justiciability**

- **Purushothaman Namboothiri vs State of Kerala Case, 1962:** In this case, the issue that was discussed was that a Bill pending before the State Governor does not lapse on the dissolution of the Assembly.
- However, this **judgment does not deal with the justiciability of the process of assent**.
- **Hoechst Pharmaceuticals Ltd. And … vs State Of Bihar And Others Case, 1983**: In this case, the Court ruled that a Governor reserves a Bill for the consideration of the President in the exercise of his discretion.
- However, the **Court cannot determine whether it was necessary for the Governor to reserve the Bill for the consideration of the President** and hence even this case does not deal with the justiciability of assent.

**40. Stray dog beaten to death; police launch hunt to nab accused**

**What is Prevention of cruelty of animal act,1960**

- The act **prohibits any person from inflicting, causing,** or if it **is the owner, permitting, unnecessary pain or suffering to be inflicted on any animal.**
- The act provides for **punishment for causing unnecessary cruelty** and suffering to animals.
- **Section 2** of the act **defines animals and types of animals** like domestic or captive animals.
- **Section 4 of the act** provides for the **Animal Welfare Board of India (AWBI)**, a **statutory advisory body for animal welfare** and protection of animals from unnecessary suffering and pain.
- The act **mentions forms of cruelty, exceptions, and killing of a suffering animal** in case any cruelty has been committed against it, so as to relieve it from further suffering.
- The act also **provides the guidelines** relating to **experimentation on animals for scientific purposes.**
- An **animal cannot be exhibited or trained** by any person, if:
  - Such a person is **unregistered as per the provisions** of this chapter;
  - Such an **animal has been barred from being included** in any performance by the Central Government through a notification in the Official Gazette.
- This Act provides for the **limitation period of 3 months** beyond which **no prosecution shall lie for any offences under this Act.**

**41. Govt note silent on allegations, wrestlers to move SC for FIR**

**Subject :Polity**
**Section: National Organisation**
**Indian Olympic Association (IOA)**

- The **Indian Olympic Association(IOA)** or **Indian Olympic Committee (IOC)** is the body responsible for selecting athletes to represent India at the Olympic Games, Asian Games and other international athletic meets and for managing

the Indian teams at these events. It plays with the name of **Team India**. It also acts as the **Indian Commonwealth Games Association**, responsible for selecting athletes to represent India at the Commonwealth Games.

**History of Indian Olympics**

- India first participated in the Olympics in 1900 in Paris. The country was represented by Norman Pritchard, an Anglo Indian who was holidaying in Paris during that time.
- The seeds for creation of an organisation for coordinating the Olympic movement in India was related to India's participation in the 1920 and 1924 Olympics, when **Sir Dorabji Tata** suggested the need for a Sports body at National level for promoting Olympic Sport in united India. After the 1920 Games, the Committee sending the team to these Games met, and, on the advice of Sir Dorabji Tata, invited Dr. A.G. Noehren (Physical Education Director of YMCA India) to also join them.
- Subsequently, in 1923-24, a provisional All India Olympic Committee was set-up, which organised the **All India Olympic Games** (that later became the National Games of India) in February 1924. Eight athletes from these Games were selected to represent India at the 1924 Paris Summer Olympics, accompanied by manager Harry Crowe Buck. This gave impetus to the development and institutionalization of sports in India, and, in 1927, **the Indian Olympic Association (IOA) was formed,** with **Sir Dorabji Tata** as its founding President and **A.G. Noehren as Secretary.**

**42. Mahanadi water dispute**

**Concept :**

- A controversy has erupted over Chhattisgarh's release of Mahanadi water into the lower catchment area of the river system.

**Details of the Dispute**

- As per the allegation of the Water Resource Department of Odisha, **Chhattisgarh has opened the gates of Kalma Barrage through which 1,000-1,500 cusecs of water is flowing into Mahanadi** and **have said that it is unusual for Chhattisgarh to release water during non-monsoon season.**
- The officials of the department claim that gates were opened ahead of the scheduled visit of the former Supreme Court Justice A.M. Khanwilkar who is the Chairperson of the Mahanadi Water Disputes Tribunal.
- Odisha has expressed concerns over Chhattisgarh's management of Mahanadi river water in the upper catchment area as Chhattisgarh in recent times has constructed several barrages restricting the flow of water in Odisha which is a lower catchment area.
- The non-availability of water in the Mahanadi River during the non-monsoon season has adversely impacted rabi crops and reduced drinking water availability in Odisha.

**Mahanadi Tribunal**

- In 2018, the Supreme court directed the Centre to notify a Tribunal to adjudicate the dispute.
- The **Mahandi Water Disputes Tribunal was constituted in March 2018** as Odisha filed a complaint with the **Ministry of Jal Shakti under Section 3 of the lnter-State River Water Disputes (ISRWD) Act, 1956.**.
- It has been asked to determine water sharing among basin states on the basis of:
- the overall availability of water
- contribution of each state,
- the present utilisation of water resources in each state and
- the potential for future development".
- The tribunal has been tasked to submit its report by December 2025.

**Mahanadi River**

- The Mahanadi **rises in a pool 6 km from Farsiya village in Chhattisgarh's Dhamtari district**, and **falls into the Bay of Bengal close to the temple town of Konark** in Odisha's Puri district.
- The river basin is spread over **Chhattisgarh, Odisha, and small parts of Jharkhand, Maharashtra and Madhya Pradesh.**
- Some 54.27% of the basin area is agricultural land, and 4.45% is water bodies.
- **Major Tributaries:**
- The **Seonath, the Hasdeo, the Mand and the Ib joins Mahanadi from left** whereas the **Ong, the Tel and the Jonk joins it from right**.
- **Major Dams/Projects on Mahanadi:**
- **Hirakud Dam:** This is the longest dam of India.
- Ravishankar Sagar, Dudhawa Reservoir, Sondur Reservoir, HasdeoBango and Tandula are other major projects.

## 43. Breach of privilege probe against MP

**Concept:**

- The **Chairman of Rajya Sabha has referred a complaint of "breach of privilege"** to a **committee against an MP** for alleged "disrespectful" remarks made against the Chair.
- The committee has been asked to investigate and report the matter, while no deadline has been mentioned.

**Parliamentary privilege**

- Parliamentary privilege refers to rights and immunities enjoyed by Parliament as an institution and MPs in their individual capacity, without which they cannot discharge their functions as entrusted upon them by the Constitution
- According to the Constitution, the powers, privileges and immunities of Parliament and MPs are to be defined by Parliament (Article 105). No law has so far been enacted in this respect.
- In the absence of any such law, it continues to be governed by British Parliamentary conventions.

**Breach of privilege**

- A breach of privilege is a violation of any of the privileges of MPs/Parliament. Among other things, any action 'casting reflections' on MPs, parliament or its committees; could be considered breach of privilege.
- A notice is moved in the form of a motion by any member of either House against those being held guilty of breach of privilege
- The **Speaker/Chairperson can decide on the privilege motion himself or herself or refer it to the privileges committee of Parliament.**

**Rules Governing Privilege**

- The **Constitution (Article 105) mentions two privileges**, i.e. **freedom of speech in Parliament and right of publication of its proceedings.**
- **Rule No 222 in Chapter 20 of the Lok Sabha Rule Book** and **correspondingly Rule 187 in Chapter 16 of the Rajya Sabha rulebook governs privilege.**
- A member may, with the consent of the Speaker or the Chairperson, raise a question involving a breach of privilege either of a member or of the House.
- The rules mandate that any notice should be relating to an incident of recent occurrence and should need the intervention of the House.

**Privileges Committee**

- In the Lok Sabha, the **Speaker nominates a committee of privileges consisting of 15 members as per respective party strengths.**
- A report is then presented to the House for its consideration.
- The Speaker may permit a half-hour debate while considering the report.
- The Speaker may then pass final orders or direct that the report be tabled before the House.
- A resolution may then be moved relating to the breach of privilege that has to be unanimously passed.

- In **the Rajya Sabha, the deputy chairperson heads the committee of privileges**, **that consists of 10 members.**

**Role of the Speaker/Rajya Sabha Chair**

- The Speaker/RS chairperson is the first level of scrutiny of a privilege motion.
- The Speaker/Chair can decide on the privilege motion himself or herself or refer it to the privileges committee of Parliament.
- If the Speaker/Chair gives consent under Rule 222, the member concerned is given an opportunity to make a short statement.

## 44. Wrestlers in SC: What law says on FIR in sexual harassment cases

**Why in News?**

The Supreme Court issued notice to the Delhi Police on a petition filed by seven wrestlers seeking an FIR against Brij Bhushan Sharan Singh, Wrestling Federation of India (WFI) president and BJP MP, on allegations of sexual harassment.

**Law on FIR after a Sexual Harassment Complaint**

- **Section 154 (1) of the Code of Criminal Procedure** – enables police to register an FIR after receiving information about a cognizable offence.
- A **cognizable offence/case** – A police officer may make an **arrest without a warrant**.
- Indian Penal Code Sections pertaining to **sexual harassment and sexual assault** fall within the category of **cognizable**
- The law also has provision for the registration of a 'Zero FIR'.

**What is Zero FIR?**

Even if the alleged offence has not been committed within the jurisdiction of the police station approached, the police can file an FIR and transfer it to the police station concerned.

**Justice JSVerma Committee Report**

- The **Committee on Amendments to Criminal Law**, aka the Justice JS Verma Committee – formed in the aftermath of the December 16, 2012 Delhi gangrape case.
- Recommended insertion of a section where if an **officer in-charge of a police station** refuses "or without reasonable cause" fails to record information related to a cognizable offence, he shall be **punished**. Hence section 166A was inserted in the Criminal Law (Amendment) Act, 2013.

**What is Section 166A of Criminal Law (Amendment) Act, 2013**

- If a public servant failed to conduct an investigation wherever it necessitates or especially if **failed to register an FIR** in cases of sexual offences under **Section 154** of the Code of Criminal Procedure, rigorous imprisonment for a term of minimum **six months** and maximum **two years** can be given, and he shall also be liable to **paying a fine**.
- Although this includes all cognizable offences, the provision particularly mentions certain sections of the IPC, including those related to sexual harassment, rape, and gangrape.

Ministry of Home Affairs issued advisories on mandatory action by the police in cases of crimes against women.

**FIR Provisions Under POCSO Act**

**Section21**– Any failure to report the offence or failure to record such an offence shall be punished with jail extending to six months or a fine or both.

Therefore Report to be filed mandatorily on receiving a complaint including from a child.

**Refusal to File FIR by Police**

- **Section 154 (3) of the CrPC** – a person aggrieved after refusal to file FIR by a police in-charge can send the information to the Superintendent of Police. The SP, after verification that the information discloses the commission of an offence, shall either investigate the case herself or direct for a probe.
- **Section 156 of CrPC**
- If a person is aggrieved by the police's refusal to file an FIR, a **complaint** can be made before a **magistrate under section156 (3).**
- The magistrate court can then order registration of a case at the police station.
- The complaint before the magistrate would be **treated as an FIR** and the police can initiate its investigation

**Lalita Kumari vs Govt of UP and ors. 2013**

Issue – whether the police officer is bound to file an FIR for information received of a cognizable offence or does the officer have the power to conduct a 'preliminary inquiry' before the FIR.

Constitution bench judgement – registration of an FIR under section 154 CrPC is mandatory if information of a cognizable. Scope of preliminary inquiry – only to ascertain whether the information reveals any cognizable offence. **Preliminary Enquiry should not exceed seven days**.

## 45. Autonomous Hill Development Council

**Why in News?**

Assam tribal group Dimasa National Liberation Army signs pact with government to shun violence, following a tripartite agreement, Memorandum of Settlement (MoS) with the Centre and the Assam government. Among the provisions of the MoS is formation of a Dimasa Welfare Council, headquartered in Guwahati.

## Autonomous Hill Development Council:

- Established under **Sixth Schedule** of Indian Constitution for the administration of tribal areas in **Assam, Meghalaya, Tripura and Mizoram.**
- **Article 244 (2) and Article 275 (1)** of the Constitution.
- To safeguard the rights of the tribal population in these states.
- **Governor** is empowered to increase or decrease the areas or change the names of the autonomous districts.
- Fifth schedule areas – executive powers of the Union will apply; But **Sixth schedule areas** – within **executive authority of the state**.
- Fifth schedule – administration and control of scheduled areas and scheduled tribes in any state except the four states of Assam, Meghalaya, Tripura and Mizoram. These 4 states are administered under sixth schedule.
- The **acts of Parliament or the state legislature** do not apply to autonomous districts and autonomous regions or apply with specified modifications and exceptions.
- The Councils have also been endowed with **wide civil and criminal judicial powers**, for example establishing village courts etc. However, the jurisdiction of these councils is **subject to the jurisdiction of the concerned High Court**.
- In Assam – Hill districts of Dima Hasao, KarbiAnglong and West Karbi and the Bodo Territorial Region are under Sixth Schedule.

According to the MoS signed, Dimasa Welfare Council, headquartered in Guwahati is to be formed based on the recommendations of which the state will provide development funds for Dimasa people "residing outside the jurisdiction of North Cachar Autonomous Hills Council".

## MoS Provisions

- Economic rehabilitation of surrendered cadre
- Withdraw of criminal cases for non-heinous offences
- Review of criminal cases for heinous offences a case-to-case basis
- The Centre and the state may consider a Rs500- crore package each over five years for infrastructure development.

## 46. Book hate speech cases even without complaint: SC

**Concept :**

- Calling hate speech a serious offence that can affect the secular fabric of India, the Supreme Court directed all states to suo moto register cases of such offences even if there is no formal complaint.

**Key highlights of the SC Order**

- Any hesitation to act will be viewed as contempt of the top court and appropriate action will be taken against the erring officers.
- All states and UTs shall ensure that immediately as and when any speech or any action takes place which attracts offences such as Sections 153A, 153B and 295A and 505 of the IPC, suomotu action will be taken to register cases even if no complaint is forthcoming and proceed against the offenders in accordance with law.

**Legal Provisions of Hate Speech in India:**

- **Article 21**: Responsible speech is the essence of the liberty granted under Article 21 of the Constitution.
- **Article 19(2):** It guarantees freedom of speech and expression to all citizens of India.
- **Exception**: Hate speech **has not been defined in any law in India.** However, legal provisions in certain legislations prohibit select forms of speech as an exception to freedom of speech.

**Legislations around Hate speech: The Indian Penal Code, 1860**

- **Section 124A IPC** penalises sedition
- **Section 153A IPC** penalises 'promotion of enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., and doing acts prejudicial to maintenance of harmony'.
- **Section 153B IPC** penalises 'imputations, and assertions prejudicial to national integration.
- **Section 295A IPC** penalises 'deliberate and malicious acts, intended to outrage the religious feelings of any class by insulting its religion or religious beliefs.
- **Section 298 IPC** penalises 'uttering, words, etc., with deliberate intent to wound the religious feelings of any person'.
- **Section 505(1) and (2) IPC** penalises the publication or circulation of any statement, rumour or report causing public mischief and enmity, hatred or ill-will between classes.

## 47. Women's reservation Bill cannot wait any longer

**Concept :**

- It is disheartening to witness that even 75 years after Independence, Parliament lacks substantial representation from half the population, with women holding just 14% of the seats.

**A promising start**

- **Leading CMs**: Just a decade ago, three of India's largest States, West Bengal, Tamil Nadu, and Uttar Pradesh, were in the spotlight for being led by women Chief Ministers.
- **Leading Leaders**: While Sushma Swaraj led the Opposition in the Lok Sabha, Sonia Gandhi served as both President of the Congress Party and Chairperson of the United Progressive Alliance.
- **President of India**: Also, India had its first woman President, Pratibha Patil around the same time.

**Historical Background**

- **Pre-Independence era**: From the pre-Independence era when several women's organisations demanded political representation for women.
- **Rising demand**: It can be **traced back to 1955** when a government appointed committee recommended that 10% of seats in the Lok Sabha and State legislative assemblies should be reserved for women.
- **In 1996**, the **Women's Reservation Bill (introduced in Lok Sabha)** proposed **to reserve one-third of seats in the Lok Sabha and State Legislative Assemblies for women**. However, the **bill lapsed due to strong opposition from some political parties**.
- Again the issue gained momentum in the 2000s and the bill was passed in Rajya Sabha.
- **National Perspective Plan for Women (1988):** The National Perspective Plan for Women (1988) **recommended that 30% of seats in all elected bodies should be reserved for women.** This recommendation was reiterated **in the National Policy for the Empowerment of Women,** which was adopted in 2001.

**Global Examples**

- **Outperforming their male counterparts**: The Scandinavian countries have implemented policies and governance structures that support gender equality and women's empowerment, which includes women's representation in political and leadership positions.
- **Implementing best policies**: Countries led by women have shown to have some of the best policies and governance practices. The deep scars in Rwanda, a central African nation, from the genocide, are being healed by predominantly a leadership that comprises women.
- **Norway quota**: Norway implemented a quota system in 2003 that required 40% of seats on corporate boards to be occupied by women.

**SCHEMES**

## 1. Stand Up India Scheme

**Concept :**

- **The Union Government has released data about the funds sanctioned under the Stand-Up India Scheme.**
- **About Stand-up India Scheme**
- **Stand up India scheme was launched in 2016.** The **scheme is anchored by Department of Financial Services (DFS), Ministry of Finance, Government of India.**
- The scheme was launched to **encourage entrepreneurship at the grassroots level especially for promoting economic empowerment and employment generation** among **SC, ST and women entrepreneurs.**
- It does so by **helping them to start a greenfield enterprise** in manufacturing, services or the trading sector and activities allied to agriculture.
- Stand-Up India Scheme **facilitates bank loans between Rs 10 lakh and Rs 1 Crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch** for setting up a greenfield enterprise.
- The scheme endeavors to create an eco-system that facilitates and continues to provide a supportive environment for doing business. The scheme seeks to give access to loans from bank branches to borrowers to help them set up their enterprises.
- The scheme, which covers all branches of Scheduled Commercial Banks, will be accessed in three potential ways:
  - Directly at the branch or,
  - Through Stand-Up India Portal or,
  - Through the Lead District Manager (LDM).

**Who all are eligible for a loan?**

- SC/ST and/or women entrepreneurs, above 18 years of age;
- Loans under the scheme are available for only greenfield projects. Greenfield signifies; in this context, the first time venture of the beneficiary in manufacturing, services or the trading sector and activities allied to agriculture.
- In the case of non-individual enterprises, 51 per cent of the shareholding and controlling stake should be held by either SC/ST and/or Women Entrepreneur.
- Borrowers should not be in default to any bank/financial institution.
- The Scheme envisages 'upto 15 per cent' margin money which can be provided in convergence with eligible Central/State schemes. While such schemes can be drawn upon for availing admissible subsidies or for meeting margin money requirements, in all cases, the borrower shall be required to bring in a minimum of 10 per cent of the project cost as own contribution.

**Monitoring of Scheme**

- Scheme is **monitored and its performance is reviewed periodically at various levels** such as District Level Consultative Committee (DLCC), State Level Implementation Committee (SLIC), State Level Bankers' Committee (SLBC), through video conference with banks, etc.

## 2. Noncommunicable diseases cause 40% of hospitalization

**What are NCDs?**

Noncommunicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors.

The main types of NCD are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.

NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur.

**National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)**

- National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched in 2010 in 100 districts across 21 States, **in order to prevent and control the major NCDs**.
- The main focus of the programme is on health promotion, early diagnosis, management and referral of cases, besides strengthening the infrastructure and capacity building.

**Main strategies of the programme:**

- Health promotion through behavior change with involvement of community, civil society, community-based organizations, media etc.
- Outreach Camps are envisaged for opportunistic screening at all levels in the health care delivery system from sub-centre and above for early detection of diabetes, hypertension and common cancers.
- Management of chronic Non-Communicable diseases, especially Cancer, Diabetes, CVDs and Stroke through early diagnosis, treatment and follow up through setting up of NCD clinics.

- Build capacity at various levels of health care for prevention, early diagnosis, treatment, IEC/BCC, operational research and rehabilitation.
- Provide support for diagnosis and cost-effective treatment at primary, secondary and tertiary levels of health care.
- Provide support for development of database of NCDs through a robust Surveillance System and to monitor NCD morbidity, mortality and risk factors.

**Funding:**

- The funds are being provided to States under NCD Flexi-Pool through State PIPs of respective States/UTs, with the Centre to State share in ratio of 60:40 (except for North-Eastern and Hilly States, where the share is 90:10).

**NCDs:**

- No communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviours factors.
- The main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.

## 3. National Mission for Mapping Culture

**Concept :**

- National Mission for Cultural Mapping with the mandate to map rural India's cultural assets has covered over one lakh villages.

**Details**

- The entire exercise has been carried out **under the Mera Gaon Meri Dharohar (My Village My Heritage) programme of the National Mission for Cultural Mapping (NMCM).**

**About the NMCM Mission**

- The NMCM aims to develop a **comprehensive database of art forms, artists and other resources across the country.**
- The Culture Ministry had approved the mission in 2017 with a **₹469 crore budget from 2017-2018 to 2019-2020.**

**Objectives of the Mission**

- Under this Mission, at broad-level, there are three important objectives as follows:
- **National Cultural Awareness Abhiyan**: HamariSanskritiHamariPahchan Abhiyan (Our Culture Our Identity)
- **Nationwide Artist Talent Hunt/Scouting Programme**: Sanskritik Pratibha Khoj Abhiyan
- **National Cultural Workplace**: Centralised Transactional Web Portal with database and demography of cultural assets and resources including all art forms and artists.

**Implementation**

- In this cultural asset mapping, **villages have been broadly divided into seven-eight categories** based on whether they are important ecologically, developmentally or scholastically, if they produce a famous textile or product, and if they are connected to some historical or mythological events such as the Independence struggle or epics like the Mahabharata.
- The **Indira Gandhi National Centre for Arts (IGNCA) has undertaken the cultural asset mapping of these villages through field surveys.**
- The survey documents the cultural identity of the villages by involving citizens to share what makes their village, Block or district unique.
- The survey process **involves a CSC Village Level Entrepreneur (VLE) conducting meetings with locals a**nd **then uploading interesting facts** about their village, its places of interest, customs and traditions, famous personalities, festivals and beliefs, art and culture, etc., on to a special application.
- The IGNCA **plans to cover all the 6.5 lakh villages in the country**.

## 4. Drug makers get more to time to join 'track and trace system'

**Concept :**

- Drug makers have got another extension from DGFT, this time up to August 1, to help implement the Track and Trace system for export of pharmaceuticals consignments.
- Manufacturers granted time for ensuring that data about maintaining parent-child relationship in packaging levels for export of drug formulations is uploaded on the central portal.

**Track and Trace System**

- The **pharmaceutical track and trace system** is a **logistical technology that allows drugs to be tracked and located along the supply chain.**
- To secure the domestic pharmaceutical supply chain, **Turkey became the first country in the world to adopt an end-to-end pharmaceutical track and trace system in 2012**.

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- Following the successful installation, **countries such as Argentina and Saudi Arabia began to implement the drug tracking and tracing system. China, the United States, and European Union member countries** are also working to develop an end-to-end pharmaceutical track and trace system. India is also in the process of developing its own system
- The Indian government has granted drug producers another delay until August 1 to establish the Track and Trace system for pharmaceutical export consignments.
- The **Track and Trace system was developed for at least eight years** to address issues such as counterfeit pharmaceuticals and product recalls.
- The latest extension was granted after the **Pharmaceuticals Export Promotion Council** of India (Pharmexcil) cited difficulty in adopting the system.
- The **Track and Trace system will first cover secondary and tertiary packaging**, with the main packaging coming later.

### Pharmaceutical Export Promotion Council of India

- Pharmaceutical Export Promotion Council of India (Pharmexcil) is a **promotion body set up by the Ministry of Commerce and Industry, Government of India.**
- It was set up to promote the Indian pharmaceutical industry.
- **The roles of the council are**
  - To advise the government,
  - To organize seminars and meetings on export-related issues,
  - To organize business meetings in India and abroad
  - To organize trade delegations.

### 5. Livestock Insurance Scheme

#### Concept :
- According to information by a **Parliamentary Standing Committee** (PSC) regarding zero insurance coverage of livestock in 2022-23, the **Centre is considering a comprehensive livestock insurance scheme modelling the Prime Minister's FasalBima Yojana.**

#### Findings of the Parliamentary panel:
- At present, less than 1% of the country's cattle population is insured and the average yearly premium is 4.5% of the insured amount.
- The report also highlighted that not even a single livestock was insured during 2022-23, whereas during 2021-22, 1, 74,061 animals were insured.
- The Committee asked Department of Animal Husbandry to explore the possibility of developing an App-based Livestock Insurance facility for livestock owners.
- Committee noted that high policy premium rates and general economic conditions of farmers are reasons for lower enrolment in such schemes.

#### About Livestock Insurance scheme:
- The Livestock Insurance Scheme, a **centrally sponsored scheme** was implemented on a pilot basis **during 2005-06 and 2006-07.**
- The scheme was later **implemented on a regular basis from 2008-09 in 100 newly selected districts of the country.**
- The scheme was later subsumed under the **Sub-mission on 'Innovation and Extension: on livestock development of National Livestock Mission'.**
- **Coverage:** The scheme is implemented in all the districts of the Country from 21.05.2014.
- **Animals covered:**
- The indigenous/crossbred milch animals, pack animals (Horses, Donkey, Mules, Camels, Ponies and Cattle/Buffalo Males), and Other Livestock (Goat, Sheep, Pigs, Rabbit, Yak and Mithun etc.) are covered under the purview of this component.

#### Livestock Related Facts
India has rich Livestock resources which can be seen in the following manner:

- **World's highest livestock** owner at about 535.78 million
- **First in the total buffalo population** in the world – 109.85 million buffaloes
- **Second in the population of goats** – 148.88 million goats
- **Second largest poultry** market in the world
- The **second largest producer of fish** and also the **second largest aquaculture nation** in the world
- **Third in the population of sheep (74**.26 million)
- **Fifth in the population of ducks** and **chicken**s (851.81 million)
- **Tenth in camel population** in the world – 2.5 lakhs
- **Other Livestock related initiatives**

- **Rashtriya Gokul Mission** (RGM): To undertake a breed improvement programme for indigenous breeds so as to improve the genetic makeup and increase the stock.
- **E-PashuHaat Portal**: This portal connects breeders and farmers regarding the availability of quality bovine germplasm.
- **National Animal Disease Control Programme**: It has been launched for Foot and Mouth Disease (FMD) and Brucellosis with a total outlay of Rs.13,343 crores to ensure 100% vaccination of cattle, buffalo, sheep, goat and pig population.
- **National Livestock Mission**: IT is for the intensive development of livestock, tiny livestock along with adequate availability of quality feed and fodder.
- **LivestockHealth& Disease Control Scheme**: Assistance is provided for the prevention and control of animal diseases like Foot and Mouth Disease (FMD) etc.
- **Disease Protection of Livestock**: For livestock protection, the diagnostic kits against Japanese Encephalitis (JE) and Bluetongue (BT) diseases and Subviral Particle-based Infectious Bursal Disease Vaccine were developed.

## 6. Maternity benefits to adoptive mothers

**Concept :**

- The Supreme Court agreed to hear a **petition challenging the constitutional validity of Section 5(4) of the Maternity Benefit Act, 1961**.

**Key details:**

- It states that a **woman who legally adopts a child below three months old will be entitled to 12 weeks of maternity leave.**
- The **original 1961 legislation did not have specific provisions for mothers who adopt**, and these were **inserted with the 2017 amendment** to the Maternity Benefit Act.
- **According to the amended Act** – A woman who legally adopts a child below the age of three months or a commissioning mother shall be entitled to maternity benefit for a period of twelve weeks.
- The term "**commissioning mother" refers to a surrogate mother** and has been defined as a biological mother who uses her egg to create an embryo implanted in any other woman.
- A **woman adopting a child older than three months gets no benefits**.
- The PIL **challenges this provision on grounds of being "discriminatory" and "arbitrary" towards adoptive mothers**.
- The absence of any provision for maternity leave for a mother adopting an orphaned, abandoned, or surrendered child above three months invariably prevents them from being able to utilise the statutory maternity benefits for adopted mothers.

**Maternity Benefit Act, 1961**

- The Maternity Benefit Act was originally passed to regulate the employment of women in "certain establishments" for the period before and after childbirth and to provide for maternity benefit and certain other benefits.
- Originally it **applied to every establishment being a factory, mine or plantation.**
- Later in 1973, it was extended to any such establishment belonging to Government and every establishment where persons are employed for the exhibition of equestrian, acrobatic and other performances**.**
- It **repealed the Mines Maternity Benefit Act, 1941 and Maternity Benefit Act, 1929.**
- The **right to paid maternity leaves was also given under the 1961 Act**, **although the period of such leave could not exceed twelve weeks.**
- Additionally, no woman could be allowed to avail maternity benefits if she had not **worked in the establishment for at least one hundred and sixty days in the twelve months immediately preceding the date of her expected delivery.**
- These benefits would be allowed without dismissing the female worker from service or reduction of wages.
- Violating provisions of the Act could result in three months' punishment, with or without a fine.

**The 2017 amendment**

- The Maternity Benefit (Amendment) Act, 2017 was **amended to allow 26 weeks of paid leave after childbirth, although only to biological mothers.**
- The **amendment also inserted Section 5(4) which said that adoptive or surrogate mothers legally adopting a child below three months will be entitled to a maternity benefit period of 12 weeks** from the date the child is handed over to the mother.
- **Women in the unorganized sector cannot avail the benefits of the Maternity Benefit (Amendment) Act 2017.**

## 7. MUDRA Microfinance Scheme

**Concept:**

- Prime Minister Narendra Modi hit out at people ridiculing the Pradhan Mantri Mudra Yojana (PMMY) and said those who gave loans to big businessmen "over phone" never understood the power of micro finance.

**PM MUDRA yojana**

- The **Micro Units Development & Refinance Agency (MUDRA)** was launched on April 8, 2015, by Prime Minister Narendra Modi.
- MUDRA, which stands for **Micro Units Development & Refinance Agency Lt**, is a **financial institution set up by the Government**.
- It provides **funding to the non-corporate small business secto**r through various last-mile financial institutions like **Banks, Non-Banking Financial Companies (NBFCs) and Micro Finance Institutions (MFIs).**
- MUDRA **does not lend directly to micro-entrepreneurs/individuals**.
- It aims to **provide loans up to Rs 10 lakh to non-corporate, non-farm, small and micro enterprises.**
- It is known as the **Pradhan Mantri Mudra Yojana-loans** are given under three categories:
- **Shishu up to Rs 50,000,**
- **Kishore Rs 50,001 to Rs 5 lakh, and**
- **Tarun from Rs 5 lakh to Rs 10 lakh.**
- **At least 60% of the credit would go to Shishu Category Units**, with the **remaining 40% going to Kishor and Tarun Categories.**
- The **loan provided under the PMMY is not subsidised**. However, if the loan proposal is linked to some Government scheme, wherein the Government is providing capital subsidy, it will be eligible under PMMY also.
- **Mudr**a **loans do not require any collateral/ security, and hence were perceived to be very risky.**
- **Public Sector Bank**s such as **PSU Banks, Regional Rural Banks and Cooperative Banks, Private Sector Banks, Foreign Banks, Micro Finance Institutions (MFI) and Non Banking Finance Companies (NBFC) offer these loans.**

**Eligibility:**

- Any Indian Citizen who has a business plan for a non-farm sector income generating activity such as manufacturing, processing, trading or service sector and whose credit need is less than Rs 10 lakh can approach either a Bank, MFI, or NBFC for availing of Micro Units Development & Refinance Agency Ltd. (MUDRA) loans under Pradhan Mantri Mudra Yojana (PMMY).

**Sectors covered:**

- **Land Transport Sector / Activity** – Which will inter alia support units for purchase of transport vehicles for goods and personal transport such as auto rickshaw, small goods transport vehicle, 3 wheelers, e-rickshaw, passenger cars, taxis, etc.
- **Community, Social & Personal Service Activities** – Such as saloons, beauty parlours, gymnasium, boutiques, tailoring shops, dry cleaning, cycle and motorcycle repair shop, DTP and Photocopying Facilities, Medicine Shops, Courier Agents, etc.
- **Food Products Sector** – Support would be available for undertaking activities such as papad making, achaar making, jam / jelly making, agricultural produce preservation at rural level, sweet shops, small service food stalls and day to day catering / canteen services, cold chain vehicles, cold storages, ice making units, ice cream making units, biscuit, bread and bun making, etc.
- **Textile Products Sector / Activity** – To provide support for undertaking activities such as handloom, powerloom, chikan work, zari and zardozi work, traditional embroidery and hand work, traditional dyeing and printing, apparel design, knitting, cotton ginning, computerized embroidery, stitching and other textile non garment products such as bags, vehicle accessories, furnishing accessories, etc.

**8. Ambedkar circuit train**

**Concept :**

- On April 14,2023, the government of India launched the **first Ambedkar circuit tourist train,** which **will cover prominent places associated with the life of Dr. B.R. Ambedkar.**
- The 'Bharat Gaurav Tourist train' is being operated under the 'Dekho Apna Desh' initiative, which is aimed at promoting domestic tourism, and is a joint collaboration between the Ministries of Tourism and Railways.
- The eight-day tour will include visits to places associated with the life of Dr. Ambedkar such as New Delhi, Mhow, Nagpur and the sacred Buddhist sites of Sanchi, Sarnath, Gaya, Rajgir, and Nalanda.

**Bharat Gaurav Scheme**

- Launched in November 2021, under the scheme, **trains now have a third segment for tourism**. **Till now, the Railways had passenger segments and goods segments.**
- These **trains are not regular trains that will run as per a timetable but will be more on the lines of the Ramayana Express being run by the IRCTC**.
- It was **announced under the theme-based tourist circuit trains.** These trains will be **run by both private players and IRCTC**, in theme-based circuits.
- By theme-based tourism (circuits), the railways mean trains like Guru Kripa that go to all places related to Guru Nanak or a Ramayan-themed train to touch upon places related to Lord Ram.

- Anyone, from societies, trusts, consortia and even state governments can apply to take these trains and run them on special tourism circuits based on a theme.
- Service Provider will offer all-inclusive packages to tourists including rail travel, hotel accommodation, sightseeing arrangement, visit to historical/heritage sites, tour guides etc.

**Dekho Apna Desh initiative**

- Nodal Ministry: The **Ministry of Tourism**
- The scheme aims to **promote tourism and encourage people to explore the rich cultural heritage and diversity of India.**
- The scheme is intended to offer financial help to tourists travelling to different parts of India.
- The government has set aside a substantial budget for the implementation of this scheme, which will be used to promote travel and build out tourist infrastructure around the nation.
- The scheme aims to increase domestic tourism in India and under this plan, around 50 destinations in the country will be developed and promoted to attract tourists.

## 9. Aspirational Toilets

**Concept :**

- According to the Union Ministry of Housing and Urban Affairs, a directive has been delivered to all State governments requiring them **to make sure that 25% of newly built public toilet seats in any city or urban unit would be "aspirational toilets".**
- These will have high-end features such as luxurious bath cubicles, touchless flushing, breast-feeding rooms, and automatic sanitary napkin incinerators.
- These will be indicated as "**aspirational toilets" on Google Maps**.
- The focus areas to construct these luxury restrooms will be tourist and religious destinations, as well as iconic cities in places with a high footfall.
- The Ministry has decided to engage start-ups that can build such toilets across the country.
- To make these restrooms self-sustaining, the ministry is planning to attach them into other public services like restaurants, shopping centres, libraries, movie theatres, or drug stores.

**About the scheme:**

- The **aspirational toilets scheme** was launched in September 2022 as **part of the Swachh Bharat Mission (SBM) 2.0,** with an aim to help make cities open defecation free.
- The Centre has **allocated ₹1,41,600 crore to the SBM 2.0, which is 2.5 times more than the money allotted to the first phase of the mission in 2014.**
- The cost sharing pattern with States varies depending on the population of their cities.
- As of now, 6,36,826 public toilets have been constructed under the Swachh Bharat Mission-Urban, against a target of 5,07,587. 4,355 urban local bodies have been declared open defecation-free.

## 10. Vibrant Villages plan to be merged with PM Gati Shakti

**Concept :**

- The government's flagship **Vibrant Villages Programme (VVP),** which envisages**developing infrastructure and opening up villages along the China border** to tourists, will be **integrated with the Prime Minister's Gati Shakti mega project**.
- One of the key objectives of VVP is to stop the migration of the border population which will help in gathering intelligence from the people of border villages.
- Recently, the Union Cabinet approved the programme to cover 2,967 villages in various districts of four States and one UT along the China border and **allocated ₹4,800 crores for the financial years 2023-24, 2024-25 and 2025-26.**
- **The Pradhan Mantri Gati Shakti National Master Plan is a central government project, aimed to revolutionise infrastructure in India.**
- The **digital platform of the PM Gati Shakti initiative brings together 16 Ministries and departments of the Government of India** with an aim to **facilitate integrated planning and coordinated implementation of infrastructure connectivity projects.**
- The **Bhaskaracharya National Institute for Space Applications and Geoinformatics (BISAG-N)** in Gujarat has been assigned the task of providing satellite images and GIS mapping of the projects that will be taken up under the scheme.

**Kibithu Village**

- Kibithoo, **located in Arunachal Pradesh**, is the **first village to be part of the Centre's Vibrant Villages programme.**
- Kibithu in Anjawdistrictis in the **easternmost administrative circle in India.**
- **Housing dozens of villages within the 10 km range of the McMohan line**, the villagers are fluent in Hindi because of their regular interaction with the security forces but do not have proper connectivity with the mainland.

For further notes on Vibrant Villages Programme, refer – https://optimizeias.com/130-model-villages-proposed-in-areas-along-the-eastern-border/

**11. 26 States and UTs adopts Bhu-Aadhar: DoLR**

**Concept :**

- The **Department of Land Records (DoLR**) has informed **that at least 26 States and UTs have adopted the Unique Land Parcel Identification Number (ULPIN)** or **Bhu-Aadhar** and seven more States are conducting a pilot test of the project.
- The Indian government is **aiming to digitize 100 per cent of land records by 2024.**

**Bhu-Aadhaar**

- The **Bhu-Aadhaar or ULPIN is a "14-digit alpha-numeric numbe**r generated based on the latitude longitude of the vertices of each land parcel".
- It is designated to be the "**single, authoritative source of truth of information on any parcel of land or property** to provide integrated land services to the citizens as well as all stakeholders".

**Other important initiatives for land records**
**Bhu-Naksha initiative**

- The Bhu-Naksha project introduced in 2022 is another project under the Digital India Land Record Modernisation Programme implemented in 2016.
- The **Bhu-Naksha initiative provisions for mapping boundaries and conducting spatial measurement of land to computerize land records** and **produce digitized maps of a region with parcels of demarcated land.**
- These maps are editable based on the results of property divisions in G2G (govt to govt) and G2C (govt to citizen) domains.
- These parcels of land are then identified by a Bhu-Aadhaar number.

**National Generic Document Registration System (NGDRS**)

- As many as 28 States and Union Territories (UTs) in the country have adopted the **National Generic Document Registration System (NGDRS**).
- NGDRS is a **digital portal for maintaining land records.**
- The NGDRS is an application developed for allowing people to buy land online via electronic registration of property and documents. The project was initiated by the Department of Land Resources under the aegis of the Ministry of Rural Development.

**12. SUPREME Initiative**

**Concept :**

- Recently, the Union Minister **of Science and Technology launched the SUPREME initiative** to provide financial support for the upgradation and maintenance of analytical instrumentation facilities (AIFs).

**About SUPREME Initiative:**

- The **Support for Up-gradation Preventive Repair and Maintenance of Equipment (SUPREME)**, is a first-of-its-kind programme by the government.
- It **extends financial support** for repair, upgradation, maintenance, retrofitting, or acquiring additional attachments to increase the functional capabilities of existing analytical instrumentation facilities.
- **Eligibility:** Different facilities created under the projects/ Analytical instrumentation facilities (AIFs) created earlier from the support of DST, only will be considered for the funding support under this Scheme
- Such facilities at institutions recognized by the University Grants Commission (UGC) are eligible to apply for grants under this initiative.
- The duration of support **will be for a period not exceeding 3 years.**
- The **funding pattern in the scheme would be 75:25 for all private and govt owned institutions (except for state-funded institutions for which 100% funding would be considered).**
- **The Criterion for Selection:**
- Apart from the academic and research merits of the organizations, details of how the revival of the research facility will benefit the scientific community/MSMEs/Startups will be taken into account for evaluating the proposals.
- Proven records of the sample(s) analysed, publications, patents, different beneficiaries/stakeholders associated with the facility and other parameters like Scientific Social Responsibility/ industrial R&D components will be considered for screening of the proposals.
- The selection process will be through a peer review mechanism and a visit to the organizations, if necessary.
- Expert Committee will evaluate the proposals and assist DST in making the final selection.
- **Nodal Ministry: Ministry of Science and Technology**

## 13. Star rating system for water taps

**Concept :**

- The Centre is in the process of bringing in a star rating system for water fixtures similar to the ratings for electrical appliances.

**Key details:**

- The **new rating system would have 3, 4 and 5 star water fixtures based on their water efficiency.**
- This rating system would come **under one umbrella called Bharat Tap**.

**Need:**

- Data showed that on average over 30% of water can be saved.
- However, there was not enough data available to assist consumers in making informed decisions when purchasing sanitary fixtures.
- We need to start quantifying how much water is wasted in each activity and how it adds to the overall cost of water.

**Star rating system**:

- The **Bureau of Energy Efficiency (BEE) has developed a star rating system** for electrical appliances that will help recognise an energy-efficient appliance.
- The appliance efficiency **ratings are labelled in a range of 1 to 5 stars**.
- An energy star refers to the appliance's energy efficiency, with 1 star being the least efficient and 5 stars being the most efficient.

**The Bureau of Energy Efficiency**

- The Bureau of Energy Efficiency is a **government agency under the Ministry of Power**.
- It acts as an **intermediary body between the Government, manufacturers and consumers with the goal of energy efficiency**.
- The main goal of this agency is to set norms and standards for energy ratings and act as an enforcement body.
- BEE is also responsible for making consumers aware of the importance of energy efficiency.

## 14. India's Healthcare Sector

**Why in News?**

National Health Account Estimates 2019-20 was released recently. The health account estimates describe the country's total expenditure on healthcare – whether by the government, private sector, NGOs, or individuals – and the flow of these funds. The government spent 1.35% of the country's Gross Domestic Product on healthcare during the year, bouncing back from a slight drop seen in 2018-19 as per the report.

**About NHA**

The National Health Account (NHA) estimates for India 2019-20 is the seventh consecutive NHA estimates report prepared by National Health Systems Resource Centre, designated as the National Health Accounts (NHA) Technical Secretariat in 2014 by the Health Ministry.

The NHA estimates are prepared by using an accounting framework based on the internationally accepted standard of System of Health Accounts, 2011, developed by the World Health Organization (WHO).

**Bullets**

1. Share of Out-of-Pocket Expenditure (OOPE) in Total Health Expenditure declines from 62.6% in 2014-15 to 47.1% in 2019-20.
2. Government Health Expenditure's (GHE) share in country's total GDP increases from 1.13% (2014-15) to 1.35% (2019-20).
3. Share of Government Health Expenditure in Total Health Expenditure increases from 29% (2014-15) to 41.4% (2019-20).
4. Per capita Government spending on healthcare doubles.
5. In per capita terms, GHE has doubled from Rs. 1,108 to Rs. 2,014 between 2014-15 to 2019-20. The government spending on health between 2018-19 and 2019-20 increased by 12%, more than double the growth rate between 2017-18 and 2018-19 which was at 5%.
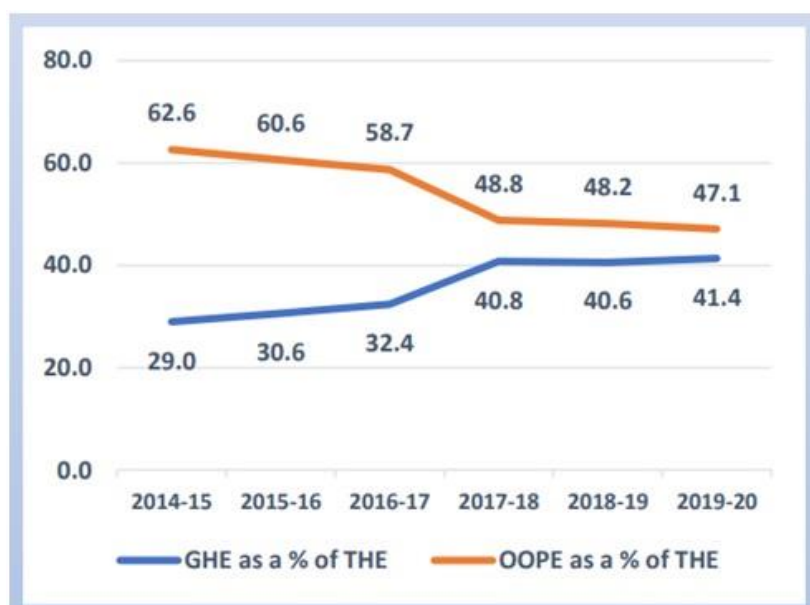
Figure 1: Government Health Expenditure and Out-of-pocket expenditure as % of Total Health Expenditure (%) (Source: PIB)

6. The share of primary healthcare in Current Government Health Expenditure (CGHE) has increased from 51.3% in 2014-15 to 55.9% in 2019-20. The increased focus on primary healthcare reinforces the government's decisions to prioritize primary healthcare in the country.
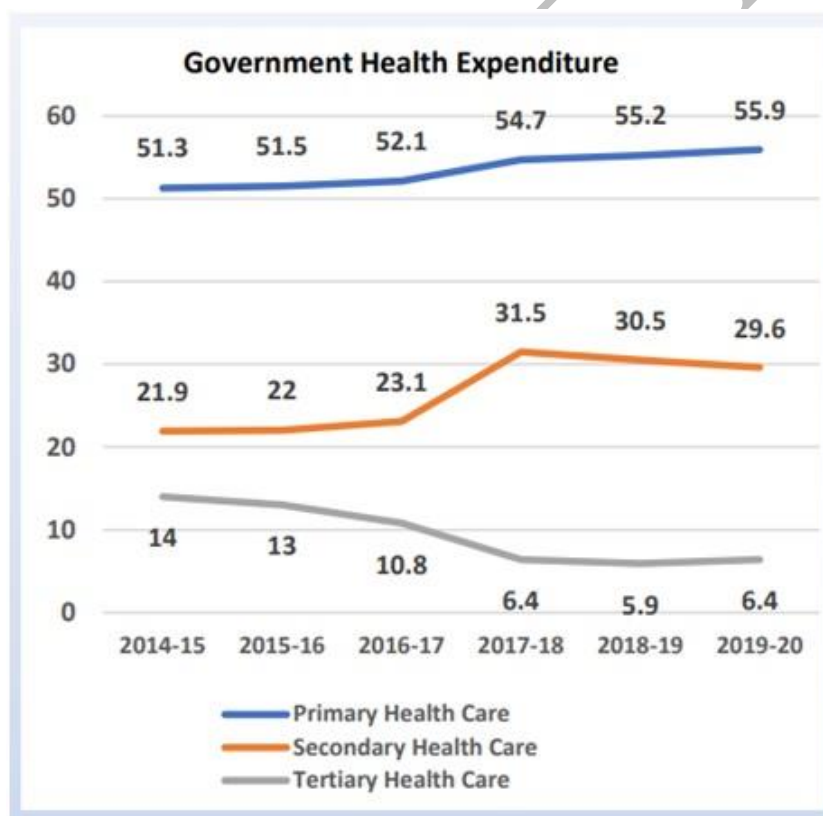


Figure 2: Share of Primary Health Care in Current Government Health Expenditure (%) Source: PIB

7. The share of Social Security Expenditure (SSE) on health, which includes government-funded health insurance, medical reimbursement to government employees, and social health insurance programs, in THE, has increased from 5.7% in 2014-15 to 9.3% in 2019-20. This increase in social security has a direct impact on reducing out-of-pocket payments.
8. State governments urged to move ahead in healthcare spending as percentage of their total budget.

The report highlights the increased public spending in primary healthcare, which is in line with **National Health policy 2017** where it states that two-thirds of public health spending must be in Primary Health systems. This is also a result of great developments/initiatives taken at grassroot level such as opening of over 1.6 lakh **Ayushman Bharat Health and Wellness Centres (AB-HWCs)** which are providing plethora of health services to the people

**Ayushman Bharat – Health and Wellness Centres**

1. In order to expand access to Comprehensive Primary Health Care (CPHC), under Ayushman Bharat – **Health and Wellness Centres (HWCs), Sub Health Centres (SHCs) and Primary Health Centres (PHCs)** are being strengthened as Health and Wellness Centres (HWCs).
2. The HWCs are to provide **preventive, promotive, rehabilitative and curative care** for an expanded range of services encompassing reproductive and child health services, communicable diseases, non-communicable diseases, palliative care and elderly care, oral health, ENT care, and basic emergency care.
3. The services in HWCs will be provided through a **Mid-level Health Care Provider (MLHP)/Community Health Officer (CHO)** placed at a HWC-SHC and Medical Officer at PHC (Rural/Urban).
4. The MLHP/CHO will undergo a Certificate in Community Health through IGNOU or public university.

## National Health policy 2017

1. It intends on gradually increasing public health expenditure to **5% of the GDP.**
2. It proposes free drugs, free diagnostics and free emergency and essential healthcare services in public hospitals.
3. The policy advocates allocating **two-thirds (of resources to primary care**.
4. It proposes two beds per 1,000 of the population to enable access within the first 60 minutes after a traumatic injury.
5. To reduce morbidity and preventable mortality of **non-communicable diseases** (NCDs) by advocating pre-screening.
6. It highlights AYUSH as a tool for effective prevention and therapy that is safe and cost-effective.
7. It **proposes introducing Yoga**in more schools and offices to promote good health.
8. It also proposed reforming medical education.
9. The policy also lists quantitative targets regarding life expectancy, mortality and reduction of disease prevalence in line with the objectives of the policy.

# SCIENCE AND TECHNOLOGY

## 1. India's semiconductor mission might need a compass

**Concept :**

- The United States Department of Commerce and its Indian counterpart have recently concluded a memorandum of understanding to **ensure that subsidies by each country do not come in the way of India's semiconductor dreams**, as espoused by the much publicized semiconductor policy.

**India's Semiconductor Mission**

- 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.

**Significance of the Mission**

- **Create a prosperous semiconductor ecosystem**– India's Semiconductor Mission is the **latest division of the Digital India Corporation.** The goal is to create a prospering semiconductor and exhibit ecosystem that would allow India to become a global center for electronics manufacturing and innovation.
- **Self -Sufficient**– The mission will be self-sufficient in terms of deciding the best technology combination, applications, node production, and capacity, as well as suggesting the fiscal aid framework and amount for approved applicants.
- **Act as focal point** – Led by global experts of the Semiconductor and display ecosystem the mission aims to serve as a focal point for the comprehensive, coherent, efficient, and smooth deployment of the Program.

**Objectives of the Mission:**

- **Long-term strategy for developing semiconductors**– Formulation of a comprehensive long-term strategy for developing semiconductors & display manufacturing facilities and semiconductor design ecosystem in the country in consultation with Government ministries / departments / agencies, industry, and academia.
- **Adoption of trusted electronics**-Facilitation in the adoption of trusted electronics through secure semiconductors and display supply chain, including raw materials, specialty chemicals, gases, and manufacturing equipment.
- **Promoting indigenous Intellectual Property** -Promoting indigenous Intellectual Property (IP) generation and encourage, enable and incentivize Transfer of Technologies (ToT).

**Way Ahead:**

- **Subsidies to enterprises-** The recent efforts is to open up subsidies to global small and medium sized enterprises in the upstream supply chain are welcome because an existing facility like the Semi-Conductor Laboratory (SCL) will benefit from this.
- **Full time director**– To execute this vision in the next five years, there is a need to have a career scientist from the Department of Space, as is the case now. This is because there is a multifaceted market that needs to be served.
- **Leverage assets at Semiconductor Laboratory (SCL**)- We need to leverage human and capital assets at the SCL to build on what exists in a targeted manner, to jumpstart the semiconductor mission by taking advantage of recent technological breakthroughs.

**Digital India Corporation**

- Digital India Corporation is a **not-for-profit Company set up by Ministry of Electronics and Information Technology (MeitY),** of India, under **Section 8 of Companies Act 2013.**
- Digital India Corporation (DIC) leads and guides in realizing the vision, objectives and goals of the Digital India program.
- It provides the strategic support to Ministries/Departments of Centre/States for carrying forward the mission of Digital India by way of Capacity Building for e-Governance projects, promoting best practises, encouraging Public-Private Partnerships (PPP), nurturing innovation and technology in various domains.

## 2. Novel catalyst offers to make hydrogen more viable as a fuel

**Concept :**

- Researchers at IIT Mandi have **developed a novel carbon-based catalyst to make water electrolysis more efficient.**
- **Water electrolysis** is the process of choice to produce 'green hydrogen 'thus making it more significant.

**Water electrolysis:**

- **In water electrolysis, water molecules are split into hydrogen and oxygen using electricity inside a device called an electrolyser. However, this process consumes a lot of electrical energy.**

**Findings**

- A new study has reported a **porous carbon material containing nitrogen that functions both as a catalyst and as the anode in electrolyser units** – and could **substitute the metal-based catalysts.**
- The researchers produced this material, **called 'laser carbon'**, by exposing a sheet of a polymer called polyimide to a laser beam, which carbonised the exposed bits, leaving the remainder rich in nitrogen.
- **Advantages of the new catalyst:**
- Laser carbon is "**highly power efficient**", **cheaper to produce**, has a **simpler synthesis** technique, and "can **be batch-manufactured with a laser**".

## Hydrogen as Fuel

- Hydrogen is a **colourless, odourless, tasteless, flammable** gaseous substance.
- It is a promising energy carrier, which has the potential to address several energy sector-related challenges.
- It has the potential to substitute conventional fuels and reduce $CO_2$ related emissions significantly at the point of use.
- Further, if **green hydrogen is used as fuel, then there is the capability to decarbonize the entire value chain,** enabling reduced emissions and climate change threats.

## Type of Hydrogen

- **Grey Hydrogen :**
  - It constitutes India's bulk production and is extracted from hydrocarbons (fossil fuels, natural gas).
  - It gives $CO_2$ as by product
- **Blue Hydrogen :**
  - It is also sourced from fossil fuels.
  - However, emissions/ by-products (CO, $CO_2$) are captured and stored.
  - Thus, it is better than grey hydrogen
- **Green Hydrogen :**
  - It is generated from renewable energy sources such as solar and wind.
  - The electricity splits water into hydrogen and Oxygen.
  - It gives water and water vapour as by-products.
  - Thus, it is the best and cleanest type.

## 3. Chennai Andaman & Nicobar Islands (CANI) Cable

### Concept :

- The undersea cable between the Andaman and Nicobar Islands and Chennai, connecting the Union Territory to global Internet, has seen a reasonable level of interest from telecom operators.
- Telecom operators have to buy bandwidth on the system to be able to serve is landers on mobile and fixed line connections with fast Web access.

### CANI Cable network

- The '**Chennai Andaman Nicobar Island' (CANI) cable system is a sub-marine cable system** to provide high speed internet to the Andaman and Nicobar Islands.
- It was launched on 30 December 2018 and has been completed in 2020 before its designated deadline.
- The CANI cable system have a speed of 100 Gigabit per second.
- The sub-marine cable system is laid on the sea bed and the total route length is 2,199.66 km.
- It **connects the Indian mainland from Chennai with the eight islands of the Union Territory** namely: Port Blair, Little Andaman (Hut Ba), Car Nicobar, Kamorta, Great Nicobar (Campbell Bay), Havelock, Long and Rangat.
- The cable lands at the beaches and terminate at the proposed beach manhold (BMH) locations and then taken to the cable landing station (CLS) for distribution.

### Significance:

- It has immense strategic significance to India in addition to assisting the Andaman and Nicobar Islands communications security, especially during natural disasters or failures of other systems.
- Telecom connectivity between the mainland and Andaman and Nicobar is through satellites with limited bandwidth capacity.

### Submarine Communication Cable

- A submarine communications cable is a **cable laid on the sea bed between land-based stations to carry telecommunication signals** across stretches of ocean and sea.
- These cables use **optical fibre technology** to carry digital data, which includes telephone, Internet and private data traffic.
- They are laid down by using specially-modified ships that carry the submarine cable on board and slowly lay it out on the seabed

- The first submarine communications cables laid beginning in the 1850s carried telegraphy traffic, establishing the first instant telecommunications links between continents, such as the first transatlantic telegraph cable which became operational on 16 August 1858.

**Optical Fibre**

- It is used to **transmit data using light pulses travelling along with a long fibre** which is usually **made of plastic or glass.**
- The **fibre optical cable** uses the application of **total internal reflection of light**. The fibres are designed such that they facilitate the propagation of light along with the optical fibre depending on the requirement of power and distance of transmission.

**4. IACS's novel compound treats drug-resistant kala-azar infection**

**Concept :**

- Researches at **Indian Association for the Cultivation of Science (IACS)** has done a experimental work in mice which has shown **novel quinoline derivative to be effective in sharply reducing the load of leishmanias**is, also **called kala-azar (black fever).**

**DNA Architecture in parasites**

- The quinoline derivative is a potent inhibitor of an enzyme called topoisomerase 1 (LdTop1), which is essential for maintenance of DNA architecture in the parasites;
- This **enzyme is distinct from the one found in humans**.
- Poisoning of **LdTop1 imparts a significant level of cytotoxicity to both the Leishmania parasites found in gut of sandfly vectors** (promastigotes) as **well as the form found in the infected humans** (amastigotes) of both the wild type and the antimony resistant isolates.
- It **doesn't induce any lethality to human and mice host cells**.

**Kala Azar Disease / Leishmaniasis**

- Leishmaniasis is a **disease caused by any species of Leishmania parasite**.
- It is **transmitted by the bite of an infected female sandfly**.
- In most cases, a person who is infected by the parasite has neither symptoms nor signs of infection and is not considered to have leishmaniasis.
- Although there are some 20 different parasites that cause the disease, **there are only three different types of leishmaniasis.**
- **Visceral leishmaniasis**, which affects **multiple organs and is the most serious form of the disease.**
- **Cutaneous leishmaniasis**, which causes skin sores and is the **most common form.**
- **Mucocutaneous leishmaniasis**, which causes skin and mucosal lesions.
- **Visceral leishmaniasis,** which is commonly known as **Kala-azar in India**, is **fatal in over 95% of the cases, if left untreated.**
- **It is one of the most neglected tropical diseases** and around 95 % of cases are reported from Bangladesh, Brazil, China, Ethiopia, India, Kenya, Nepal, Somalia, South Sudan, and Sudan.

**Drug Resistant**

- The only drug available against leishmaniasis, **miltefosine, is rapidly losing its effectiveness because of emerging resistance** to this drug due to a decrease in its accumulation inside the parasite.
- A **protein called 'P4ATPase-CDC50', is responsible for intake of the drug by the parasite**, and **another protein, called 'P-glycoprotein', is responsible for throwing this** drug out from within the parasite's body.
- A decrease in the activity of the former protein, and an increase in the activity of the latter results in less accumulation of miltefosine inside the parasite's body, thus causing it to become resistant to the drug.

## WHAT IS KALA-AZAR

- A slow progressing indigenous disease
- Caused by protozoan parasite of genus *Leishmania*
- In India, *Leishmania donovani* is the only parasite causing the disease
- The parasite primarily infects reticuloendothelial system

**Signs & Symptoms**
➡ Recurrent fever
➡ Loss of appetite
➡ Weakness
➡ Spleen enlargement
➡ Anaemia

### Transmission

- Sandfly of genus *Phlebotomus argentipes* only known vector of kala-azar in India

- Indian kala-azar has a unique epidemiological feature of being anthroponotic
- Female snadflies pick up parasite while feeding on infected human host

- Development and multiplication in the gut of sandflies and move to mouthparts

- Parasite undergoes morphological change to become flagellate
- Healthy human hosts get infection when an infective sandfly vector bites them

**5. Intergalactic stream of cosmic carbon feeding massive galaxy**

**Concept :**

- Radio telescope observations have revealed a cold stream of intergalactic atomic carbon gas feeding star formation in a massive radio galaxy in the young Universe.
- The findings provide observational evidence supporting theoretical cosmological models and offer new **insights into the origins of the cosmic materials** that enable galaxy and star formation.
- **Galaxies evolve by accreting gas,** either in **mergers with other galaxies** or from **streams of cold molecular gas.**

**Cold dark matter theory:**

- The theory suggest that hydrogen gas created in the big bang collapses first into sheets and then into filaments strung out across space.
- In places where filaments cross or are clustered together, **galaxies form and the filaments continue to fuel the growth of galaxies by feeding them a steady stream of gas.**

**Cosmic Web:**

- Galaxies across the universe are connected by a complex structure made up of filaments of dark matter and sheets of hydrogen gas. The **network connecting these intergalactic filaments is known as cosmic web.**
- The existence of the cosmic web is central to current theories of how galaxies first formed following the big bang, however, evidence for it had remained largely theoretical.
- The recent observations of the cosmic web support the cold dark matter theory of galaxy formation.

**6. ISRO tested Reusable Launch Vehicle**

**Concept:**

- ISRO successfully carried out the landing experiment of **the Reusable Launch Vehicle-Technology Demonstration (RLV-TD)** programme at the **Aeronautical Test Range in Chitradurga, Karnataka.**

**About Reusable Launch Vehicle-Technology Demonstration (RLV-TD):**

- The **configuration of RLV-TD is similar to that of an aircraft** and combines the complexity of **both launch vehicles and aircraft.**
- The winged RLV-TD has been configured to act as a flying test bed to evaluate various technologies, namely, hypersonic flight, autonomous landing and powered cruise flight.

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- In future, this vehicle will be scaled up to become the first stage of India's reusable two stage orbital launch vehicle.
- **Components:**
  - RLV-TD consists of a fuselage (body), a nose cap, double delta wings and twin vertical tails.
  - It also features symmetrically placed active control surfaces called Elevons and Rudder.
  - This technology demonstrator was boosted to Mach no: 5 by a conventional solid booster (HS9) designed for low burn rate.
- **Objectives of RLV-TD:**
  - Hypersonic aero thermodynamic characterisation of wing body
  - Evaluation of autonomous Navigation, Guidance and Control (NGC) schemes
  - Integrated flight management
  - Thermal Protection System Evaluation
- **Significance**
  - In a first in the world, a winged body has been carried to an altitude of 4.5 km by helicopter and released for carrying an autonomous landing on a runway.
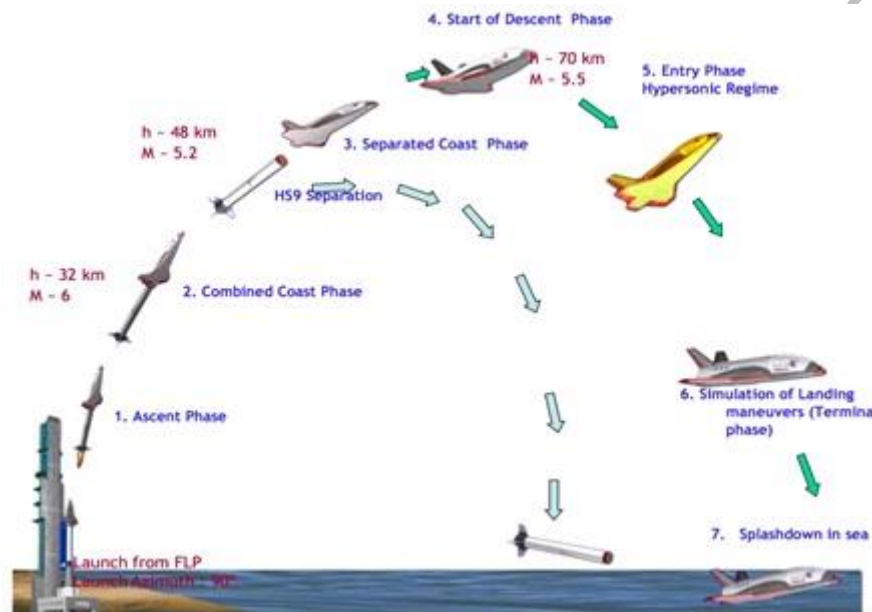


**Aeronautical Test Range (ATR) Facility**:

- Aeronautical Test Range (ATR) is an **outdoor testing and evaluation facility** set up by DRDO exclusively **for unmanned and manned aircraft**.
- The ATR is under the command of the **Aeronautical Development Establishment (ADE).**
- ATR is located at Varavoo Kaval in Challakere Taluk of Chitradurga district
- ATR, Chitradurga has a Range Control Centre (RCC) with air traffic display system. It is equipped with a mission video distribution and display system. It has a Radar Centre which houses primary and secondary surveillance radars.

## 7. Bharat 6G Vision Document

**Concept :**

- Recently, Prime Minister Narendra Modi unveiled the Bharat 6G Vision Document, a starting point for policymakers and the industry to gear up for the next generation of telecommunications.

**India's 6G Roadmap**

- The Government of India formally launched 5G services in October 2022 and said that India should be ready to launch 6G services in the next 10 years.
- The Bharat 6G project will be implemented in two phases and the government has also appointed an apex council to oversee the project and focus on issues such as –
  - Standardisation,
  - Identification of the spectrum for 6G usage,
  - Create an ecosystem for devices and systems, and
  - Figure out finances for research and development, etc.
- In **Phase One (from 2023 to 2025**), support will be provided to explorative ideas, risky pathways and proof-of-concept tests.
- Ideas and concepts that show promise and potential for acceptance by the global peer community will be adequately supported to develop them to completion, leading to commercialisation as part of **Phase Two (from 2025 to 2030).**

- To fund research and innovation on 6G, the document recommended the creation of a **corpus of Rs 10,000 crore** to facilitate various funding instruments such as grants, loans, VC fund, etc.
- Some indicative goals are to –
- Guarantee every citizen a minimum bandwidth of 100Mbps;
- Ensure every gram panchayat has half a terabit per second of connectivity; and
- Blanket the country with over 50 million internet hotspots, with thirteen per square km.

**Why did the Government put out a 6G Vision Document?**

- To accelerate **India's wireless data consumption lead and assume leadership** in setting the standards for 6G in the coming years.
  - This may involve everything from encouraging local manufacturing of telecom gear to supporting Indian companies and engineers in international discussions around standardisation.
  - Standardisation is key, as telecommunications standards are usually adopted globally.
- **Delay in previous generations of telecommunications technology** rolling out in India.
  - For example, 5G was rolled out years after countries like South Korea and the US had already covered their major urban areas with high-speed wireless connectivity.
  - India does not want a repeat of that.
- Yet **another reason is pure physics**:
  - Frequencies generally increase in newer generations of networks, but the lower the frequency, the longer a cell signal can travel.
  - With increasing data usage, lower frequencies in 4G networks may not physically be able to keep up with the demand for traffic.



**How are Other Countries Looking at the 6G Rollout?**

- **South Korea** has **outlined a 6G research and development plan** with Rs 1200 crore worth of investments in the first phase running till 2025.
- **In Japan**, the **Integrated Optical and Wireless Network (IOWN) Forum** has published its **Vision 2030 for 6G for infrastructure** evolution in four dimensions – cognitive capacity, responsiveness, scalability, and energy efficiency.
- Key developments in **6G have also been identified** and are being **pursued in China**, in order to **support connectivity plus sensing plus Artificial Intelligence** (AI).

*For further notes on 6G Technology, refer – https://optimizeias.com/6g-technology/*

**8. NASA announced the astronauts for ARTEMIS Mission**

**Concept :**

- NASA has announced the four astronauts that **will go to the lunar orbit and come back with the Artemis 2 mission**—mission commander Reid Wiseman, Victor Glover, Canadian Space Agency astronaut Jeremy Hansen and NASA mission specialist Christina Koch.

**Artemis II:**

- It will take off in 2024.
- Artemis II will have a crew aboard **Orion and will be a test mission to confirm that all of the spacecraft's systems will operate as designed when it has humans on board**.

- But the **Artemis II launch will be similar to that of Artemis I.** A crew of four astronauts will be aboard Orion as it and ICPS orbit the Earth twice before moving to the direction of the Moon.
- The Artemis 1 mission allowed NASA to test the foundations of its latest human space exploration capabilities. This included the Space Launch System (SLS) rocket, Orion spacecraft, and all associated ground systems.
- **Artemis 2 will be the first crewed mission to test all this.**
- The 10-day-long mission will have the four astronauts flying around the Moon to test Orion and its life-support missions to ensure that it can provide a safe habitat that will allow astronauts to live and work during deep space missions.

**What will happen during the Artemis 2 mission?**

- The initial launch will be similar to what happened during the Artemis 1 mission.
- After that, the **Orion spacecraft and the SLS's upper stage (ICPS or the interim cryogenic propulsion stage) will orbit Earth twice.**
- They do this to **ensure that all of Orion's systems are working fine while it is still close to our planet.**
- After this, the Orion spacecraft will travel to about 10,300 kilometres past the far side of the Moon. From this vantage point, the astronauts will be able to see both the Moon in the foreground and the Earth in the distant background.
- Orion will take advantage of the Earth-Moon gravity field to bring itself back to our planet without any propulsion at all. This is possible because the spacecraft is taking a "lunar free return trajectory."

*For further notes on Artemis Mission, refer – https://optimizeias.com/nasa-unveils-new-space-suits-for-moon-missions/*

**9. Space Communication race: to auction or allocate**

**Concept :**

- Majority of the parties interested in the **future of space communication technology** largely agree that **administrative allocation of spectrum would be the right approach**.
- However, there is one outlier – **Reliance Jio,** which has in previous communications to the government made it clear that **it favours an auction for the frequency bands**.

**TRAI Recommendation**

- Last year, TRAI had sent its **recommendations on auction of spectrum in respective frequency bands including 27.5-28.5 GHz as part of 24.25-28.5 GHz band**, it had said, "it is for the DoT to decide whether frequency **range 27.5-28.5 GHz is to be allocated/ auctioned for IMT/5G**".

**About Satellite communication :**

- Satellite communication refers to any communication link that involves the use of an artificial satellite in its propagation path.
- Satellite communications play a vital role in modern life.
- There are over 2000 artificial satellites in use.
- They can be found in geostationary, Molniya, elliptical, and low Earth orbits and are used for traditional point-to-point communications, mobile applications, and the distribution of TV and radio programs.
- Satellite communications tend to use high-frequency signals.

**Working of a Communication satellite- Radio Communication**

- A communications satellite is an artificial satellite that relays and **amplifies radio telecommunications signals through a transponder.**
- It basically creates a communication channel between a source transmitter and a receiver at different locations on earth.
- Communications satellites are **used for television, telephone, radio, internet, and military applications.**
- There are currently 2,134 communications satellites in the earth's orbit and these comprise both private and government organizations.
- Several are in geostationary orbit 22,236 miles (35,785 km) above the equator, so that the satellite appears stationary at the same point in the sky.
- The orbital period of these satellites is the same as the rotation rate of the Earth, which in turn allows the satellite dish antennas of ground stations to be aimed permanently at that spot; they do not have to move along and track it.
- Since the **high frequency radio waves used for telecommunications links travel by line of sight, they get obstructed by the curve of the earth**.
- Communications satellites relay the signal around the curve of the earth thus making possible communication between widely removed geographical points.
- Communications satellites **use a wide range of radio and microwave frequencies**.
- **Signal Interference**
- To avoid signal interference, international organizations have regulations stating which frequency ranges (or bands) certain organizations are permitted to use. This allocation of bands reduces the chances of signal interference.

RADIO FREQUENCY BANDS & APPLICATIONS

**Extremely Low Frequency**
ELF
Frequency: 3 KHz to 30 KHz
Wavelength: 100 km to 10 km
Maritime radio, navigation

**Low Frequency**
LF
Frequency: 30 KHz to 300 KHz
Wavelength: 10 km to 1 km
Maritime radio, navigation

**Medium Frequency**
MF
Frequency: 300 KHz to 3 MHz
Wavelength: 1 km to 100 m
AM radio, Aviation radio, navigation

**High Frequency**
HF
Frequency: 3 MHz to 30 MHz
Wavelength: 100 m to 10 m
Amateur radio, NFC, aviation, weather broadcast

**Very High Frequency**
VHF
Frequency: 30 MHz to 300 MHz
Wavelength: 10 m to 1 m
FM radio, VHF television

**Ultra High Frequency**
UHF
Frequency: 300 MHz to 3 GHz
Wavelength: 1 m to 100 mm
Mobile, Wi-Fi, GPS, 4G, UHF television

**Super High Frequency**
SHF
Frequency: 3 GHz to 30 GHz
Wavelength: 100 mm to 10 mm

**Extremely High Frequency**
EHF
Frequency: 30 GHz to 300 GHz
Wavelength: 10 mm to 1 mm
Satellite, 5G, Wi-Fi, Radio astronomy

RADIO FREQUENCY SPECTRUM

**Free Space Optical Communication (FSO)**

- But recent development in FSO communications has made it a strong alternative to RF systems.
- FSO systems consist of a **transmitting terminal and receiving terminal**. Much like an RF system, information is encoded onto electromagnetic waves using modulation and sent to the receiving system.
- FSO links **operate at a much higher frequency than RF links**, generally **at infrared or visible band Higher frequencies** result in **wider bandwidths which result in higher data rates.**

**10. Twitter Open-source code**

**Concept :**

- Recently, twitter opened a portion of its source code to the public, including the algorithm to recommend tweets in users' timelines.

**About Open source code:**

- Open source is a term that **originally referred to open source software** (OSS).
- Open source software is **code that is designed to be publicly accessible—anyone can see, modify, and distribute the code as they see fit.**

- Open-source software is **developed in a decentralized and collaborative way,** relying on peer review and community production.

**What is Source code?**

- It is **the set of instructions and statements written by a programmer using a computer programming language.**
- This **code is later translated into machine language by a compiler**. The translated code is referred to **as object code**.
- Source code is the source of a computer program.
- It contains declarations, instructions, functions, loops and other statements, which act as instructions for the program on how to function.
- Programs may contain one or more source code text files, which can be stored on a computer's hard disk, in a database, or printed in books of code snippets.

**What is closed-source software?**

- It is software in which the **public is not given access to the source code**, **so they can't see or modify it in any way.**

## 11. Indian Space Policy 2023

**Concept :**

- The government approved the Indian Space Policy 2023.

**Details of the Space Policy**

- It seeks to **institutionalise the private sector participation in the space sector**, with ISRO focusing on research and development of advanced space technologies.
- The policy will **allow the private sector to take part in end-to-end space activities** that include building satellites, rockets and launch vehicles, data collection and dissemination.
- The Indian Space Policy-2023, also **delineated the roles and responsibilities of ISRO, space sector PSU NewSpace India Limited (NSIL) and Indian National Space Promotion and Authorization Center (IN-SPACe).**
- **Strategic activities related to the space sector will be carried out by NSIL**, a public sector undertaking under the Department of Space, which will work in a demand-driven mode.
- The **INSPACe, created recently, will be the interface between Indian Space Research Organisation and non-governmental entities.**
- The policy also spells out the framework for the private sector to use ISRO facilities for a small charge and encourages them to invest in creating new infrastructure for the sector.
- **ISRO will not do any operational and production work for the space sector a**nd focus its energies on developing new technologies, new systems and research and development.
- The **operational part of ISRO's missions will be moved to the NewSpace India Limited**, a public sector undertaking under the Department of Space.

**Significance**

- India's share in the global space economy was less than two per cent at present and the space policy will help it increase substantially to 10 per cent in the future.
- It will pave the way forward with much-required clarity in space reforms and augment private industry participation to drive the space economy opportunity for the country.

## 12. Fortified rice through PDS

**Concept :**

- The distribution of fortified rice through the Public Distribution System (PDS) in India is an ongoing initiative by the government to address the issue of malnutrition among the poor and vulnerable sections of society.
- **Fortified rice with essential micronutrients like iron, zinc, and Vitamin A**, is being distributed through the PDS in several states in India.
- The distribution of fortified rice through the PDS is being implemented in a phased manner across the country. The **government has set a target to distribute fortified rice through the PDS to all states and Union Territories by 2024.**
- A total of 269 districts in 27 states have **started distributing fortified rice under Targeted Public Distribution System (TPDS), achieving a 100% target set for Phase II by March 2023 in the Rice Fortification Programme.**
- The distribution of fortified rice through the PDS is expected to have a significant impact on reducing malnutrition and improving the health and well-being of the poor and vulnerable sections of society, especially women and children.

**Rice fortification**

- The Food Safety and Standards Authority of India (FSSAI) defines fortification as "deliberately increasing the content of essential micronutrients in a food so as to improve the nutritional quality of food and to provide public health benefit with minimal risk to health".

- The cooking of fortified rice **does not require any special procedure.**
- After cooking, **fortified rice retains the same physical properties and micronutrient levels as it had before cooking.**
- **Fortified rice will be packed in jute bags with the logo ('+F') and the line "Fortified with Iron, Folic Acid, and Vitamin B12".**
- Various technologies are available to add micronutrients to regular rice, such as **coating, dusting, and 'extrusion**'.
- The Extrusion technique involves the **production of fortified rice kernels (FRKs) from a mixture using an 'extruder' machine.**
- It is considered to be the best technology for India.
- The fortified rice kernels are blended with regular rice to produce fortified rice.

## Need of rice fortification

- India has very high levels of malnutrition among women and children.
- According to the Food Ministry, every second woman in the country is anaemic and every third child is stunted.
- Fortification of food is considered to be one of the most suitable methods to combat malnutrition.
- Rice is one of India's staple foods, consumed by about two-thirds of the population.
- Per capita rice consumption in India is 6.8 kg per month.
- Therefore, fortifying rice with micronutrients is an option to supplement the diet of the poor.

## What are the standards for fortification?

- Under the Ministry's guidelines, **10 g of FRK must be blended with 1 kg of regular rice.**
- According to FSSAI norms**, 1 kg of fortified rice will contain the following: iron (28 mg-42.5 mg), folic acid (75-125 microgram), and vitamin B-12 (0.75-1.25 microgram**).
- **Rice may also be fortified** with **zinc (10 mg-15 mg), vitamin A (500-750 microgram RE), vitamin B-1 (1 mg-1.5 mg), vitamin B-2 (1.25 mg-1.75 mg), vitamin B-3 (12.5 mg-20 mg) and vitamin B-6 (1.5 mg-2.5 mg) per kg.**

## Advantages

- Fortified staple foods will contain natural or near-natural levels of micro-nutrients, which may not necessarily be the case with supplements.
- It provides nutrition without any change in the characteristics of food or the course of our meals.
- If consumed on a regular and frequent basis, fortified foods will maintain body stores of nutrients more efficiently and more effectively than will intermittently supplement.
- The overall costs of fortification are extremely low; the price increase is approximately 1 to 2 percent of the total food value.
- It upholds everyone's right to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger

## Issues with fortified food

- Fortification and enrichment upset nature's packaging. Our body does not absorb individual nutrients added to processed foods as efficiently compared to nutrients naturally occurring.
- Supplements added to foods are less bioavailable. Bioavailability refers to the proportion of a nutrient your body is able to absorb and use.
- They lack immune-boosting substances.
- Fortified foods and supplements can pose specific risks for people who are taking prescription medications, including decreased absorption of other micro-nutrients, treatment failure, and increased mortality risk.

## 13. H5N1 spreads to mammals

**Context:** Uncontrolled spread of the virus can be catastrophic to the already endangered bird species globally, leading to the mass extinction of several species.

**More on the News:**

- Since 2022, the **virus has infected over 100 million birds across the globe**, resulting in the deaths of over 50 million and culling of millions of poultry.
- This year, the world has been witnessing one of the worst-ever documented outbreak of the **highly pathogenic avian influenza H5N1** killing millions of birds. The virus, which is known to cause severe disease and death in birds, has also been detected in mammalian species and also in humans.
- This has put health authorities on high alert regarding the implications of the large outbreak on public health.
- The **transmission of H5N1 from birds to mammals is rare**, but when it does occur, it can be a **cause for concern**, as the **virus could accumulate mutations** and acquire the ability to potentially initiate human outbreaks.
- H5N1 has a **high mortality rate of over 60% in humans** and is primarily transmitted to **humans through close contact with infected birds or animals**, either through handling infected poultry or exposure to contaminated environments.

- In the recent months, a **few sporadic cases of human H5N1 infections have also been reported from Ecuador, Cambodia, and more recently in Chile**.
- Given the ongoing threat of an influenza pandemic, monitoring the spread in mammalian populations is important in areas of close contact between humans and animals. However, since the **virus does not yet transmit efficiently among humans, the World Health Organization (WHO) has assessed the risk of H5N1 to humans to be low.**
- However, the large and unabated outbreak in avian species and not so rare mammalian spillovers could potentially provide the virus a chance to adapt for mammalian transmission.

Avian Flu https://optimizeias.com/avian-flu/

## 14. LIGO India Project

### Concept :

- The government has given the final go-ahead to India's Laser Interferometer Gravitational-Wave Observatory, or LIGO, project.

### LIGO India Project

- **LIGO is an international network of laboratories that detect the ripples in spacetime** produced by the movement of large celestial objects like stars and planets.
- **LIGO-India will** be located in **Hingoli district of Maharashtra**, about 450 km east of Mumbai, and is scheduled to begin scientific runs from 2030.

### LIGO (Laser Interferometer Gravitational-Wave Observatory)

- It is an international network of laboratories meant to detect gravitational waves.
- Under this, two large observatories (~ 3000 Km apart) were built in the US (Hanford Site, Washington and Livingston, Louisiana) with the aim of detecting gravitational waves by laser interferometry.
- **Interferometry is a technique which uses the interference of superimposed waves to extract information.**
- Besides the **US,** such gravitational wave observatories are currently operational in **Europe and Japan**.
- **LIGO-India will be the fifth**, and **possibly the final node of the planned network**.

### Why is a Fifth LIGO Observatory Needed?

- Extremely low strength of gravitational waves make their detection very difficult.
- Therefore, LIGO-India is part of the plan to expand the network of gravitational wave observatories in order to increase the chances of detecting these waves from anywhere in the observable universe.
- This will improve the accuracy and quality of information taken from them.

### Gravitational Waves

- These are the **ripples in space-time produced by the movement of large celestial bodies like stars and planets.**
- These were postulated **over 100 years ago in Albert Einstein's General Theory of Relativit**y that encapsulates the current understanding of how gravitation works.
- However, they **were first discovered in 2015 by two LIGOs based in the United States.**
- In 2017, this experimental verification of the century-old theory received the Nobel Prize in Physics (to Rainer Weiss, Barry C. Barish and Kip S. Thorne).
- Until now, at least 10 events producing gravitational waves have been detected.

LIGO – A GIGANTIC INTERFEROMETER

Illustration: ©Johan Jarnestad/The Royal Swedish Academy of Sciences
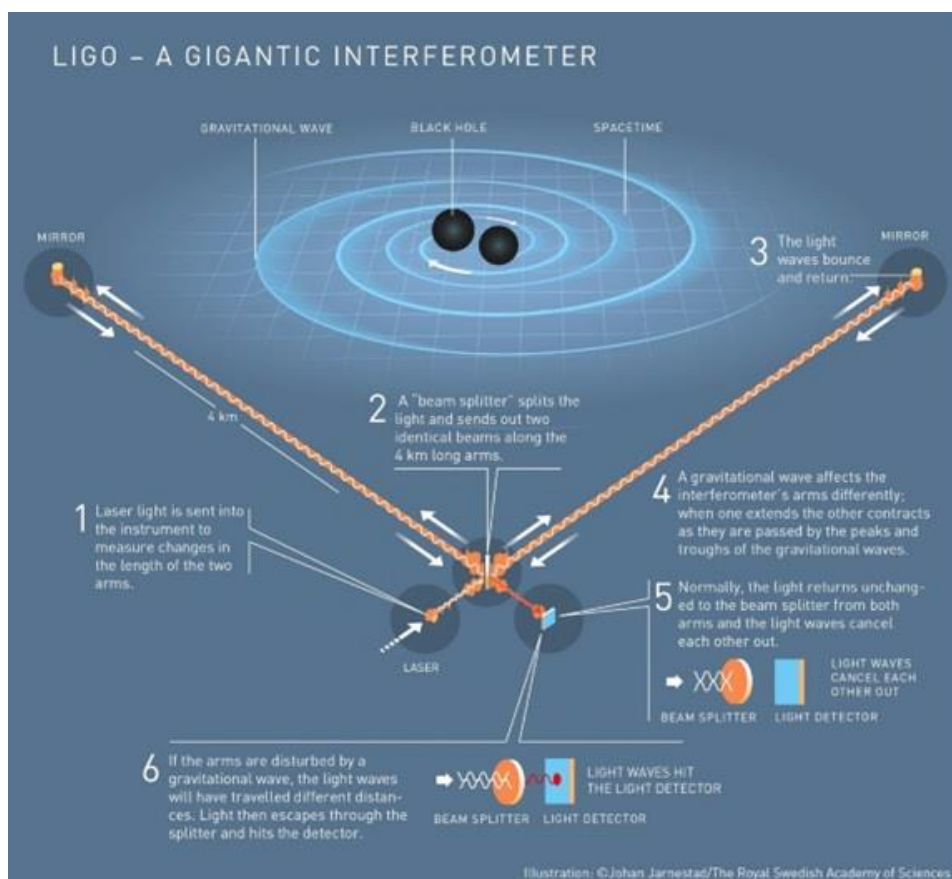
**Significance for India**

- For India, LIGO is a momentous milestone. **India has been an active collaborator in a number of international science projects.**
- These include the **Large Hadron Collider experiments, and ITER, the effort to create a thermonuclear react**or that would enable controlled nuclear fusion reactions.
- India is also expected to be a partner country in setting up the next space station after the current International Space Station comes to the end of its life later this decade.
- However, **India has not yet built a cutting-edge scientific facility on this scale on its own soil, something that can have huge spin-off benefits for its science and technology sector**.
- The India-based Neutrino Observatory, one such facility that has been planned in India, has been facing delays.
- LIGO, therefore, is **crucial to demonstrating India's intent and capability to pull-off complex science projects o**n its own.
- The new Ligo observatory, in combination with its partners, will let scientists probe deep questions about black holes and neutron stars. "The new detector will improve chances of doing science in India.

**15. Genome India Project**

**Concept :**

- Recently, the secretary of the Department of Biotechnology said that under the Genome India project, close to 7,000 genomes have been sequenced and 3,000 of these are already available for public access.

**Genome India Project**

- Taking inspiration from the Human Genome Project, the Department of Biotechnology (DBT) initiated the ambitious "Genome India Project" (GIP) on 3rd January 2020. It is a Central Sector Project.
- The GIP aims to **collect 10,000 genetic samples from citizens across India, to build a reference genome**.
- This is a mission-mode, multi-institution consortium project, the first of its kind in India supported by the Department of Biotechnology, Government of India.

**Goal**

- The goal of the research is to develop predictive diagnostic indicators for several high-priority diseases and other uncommon and genetic disorders.
- In phase 2, the project would collect genetic samples from patients with three broad categories – cardiovascular diseases, mental illness, and cancer.

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- Through whole-genome sequencing, the plan is to build an exhaustive catalogue of genetic variations for the Indian population.

**Targeted areas**

- Some of the priority areas are Precision health, Rare genetic disorders, Mutation spectrum of genetic and complex diseases in the Indian population, Genetic Epidemiology of Multifactorial Lifestyle Diseases, and Translational Research.

**What is a genome?**

- Every organism's genetic code is **contained in its Deoxyribose Nucleic Acid (DNA),** the building blocks of life.
- A **genome, simply put, is all the genetic matter in an organism.**
- It is defined as "**an organism's complete set of DNA, including all of its genes**.
- Each genome contains all of the information needed to build and maintain that organism.
- In humans, a copy of the entire genome — more than 3 billion DNA base pairs — is contained in all cells that have a nucleus".

## 16. Tropospheric Emissions: Monitoring of Pollution (TEMPO) Instrument

**Concept :**
**About TEMPO**

- The **Tropospheric Emissions: Monitoring of Pollution (TEMPO) instrument** was launched by NASA in a Falcon 9 rocket.
- The **instrument will measure pollution and air quality across greater North America** on an **hourly basis during the daytime**.
- TEMPO will have multiple applications
- measuring levels of various pollutants
- providing air quality forecasts
- helping the development of emission-control strategies
- **Existing pollution-monitoring satellites are in low Earth orbit (LEO), but TEMPO will be hosted in geostationary orbit.**
- TEMPO will allow **scientists to monitor air pollutants and their emission sources from space more comprehensively than before.**
- A **geostationary orbit is 36,000 kilometers above the equator**, where the **orbiting satellite will match the rotation of the Earth. (**meaning it will stay over the same location)

**Similar Instruments**

- TEMPO will be part of a constellation of instruments measuring air quality over the Northern Hemisphere which includes the **European Space Agency's Sentinel-4** (under development) and **South Korea's Geostationary Environment Monitoring Spectrometer.**

## 17. CSIR Scientists find rare earth deposits in Anantapur

**Concept :**

- Hyderabad based National Geophysical Research Institute (NGRI) has found large deposits of 15 rare earth elements (REE) in Andhra Pradesh's Anantapur district.

**About Rare Earth Elements (REE):**

- REE are a **set of seventeen elements in the periodic table**. These include the **fifteen lanthanides on the periodic table plus scandium and yttrium.**
- **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**.**
- REE are all metals, and the group is often referred to as **the "rare earth metals.**
- Although called "rare", they are **actually found relatively abundantly in the Earth's crust.**

**Why they are called "rare"?**

- These metals **are very difficult to mine because it is unusual to find them in concentrations high enough** for economical extraction.
- These metals **have many similar properties, and that often causes them to be found together in geologic deposits.**

- They are also **referred to as "rare earth oxides" because many of them are typically sold as oxide compounds.**

**Applications:**

- REE and alloys that contain them are used in many devices that people use every day such as computer memory, DVDs, rechargeable batteries, cell phones, catalytic converters, magnets, fluorescent lighting and much more.
- Rare earths are used as catalysts, phosphors, and polishing compounds.

## 18. New uranium isotope

**Concept :**

- A team of nuclear physicists affiliated with multiple institutions in Japan, working with a colleague from Korea, has **discovered a previously unknown uranium isotope with atomic number 92 and mass 241.**
- The group forced the isotope to reveal itself and tested the results of their efforts to show that what they had found was **indeed uranium-241.**

**Details of the Finding**

- In this new effort, the research team tried a new approach—**they fired a sample of unranium-238 nuclei at a sample of platinum-198 nuclei** using an isotope separation system.
- Such interactions are known to result in multinucleon transfer, in which isotopes swap neutrons and protons. The collision resulted in the creation of a large number of fragments, which the researchers studied to determine their makeup.
- They found evidence of 19 heavy isotopes holding from 143 to 150 neutrons. Each was measured using **time-of-flight mass spectrometry**, a technique that involves determining the mass of a traveling ion by tracking the time it takes to travel a given distance when its initial acceleration is known.
- The research team noted that most of the isotopes they measured had never been measured before.
- They also noted that one of them, **uranium-241, had never been observed before and that it marks the first time since 1979 that a neutron-rich uranium isotope has been discovered.** The researchers also calculated that uranium-241 likely has a half-life of just 40 minutes.

**Significance**

- The technique used by **the team represents a pathway to better understanding the shapes of large nuclei associated with the heavy elements,** which could yield changes to models used to build nuclear power plants and weapons and to theories describing the behavior of exploding stars.
- The research team notes that that their **method of discovery could be used to learn more about other heavy isotopes** and also, **perhaps, to discover new ones.**

**Uranium Element**

- Uranium (U) is a **radioactive chemical element of the actinide series of the periodic table, atomic number 92.**
- Uranium is a **dense, hard metallic element that is silvery white in colour**. It is **ductile, malleable, and capable of taking a high polish.**
- **Occurrence:**
- Uranium occurs **naturally in low concentrations in soil, rock and water** and is **commercially extracted from uranium-bearing minerals**.
- Uranium occurs naturally in several minerals such as **uraninite (pitchblende), brannerite and carnotite.** It is also **found in phosphate rock and monazite sands**.
- **Monazite sands occur on the east and west coasts and in some places in Bihar**. But the largest **concentration of monazite sand is on the Kerala coast.**

**Applications**

- Uranium that has a silvery grey metallic appearance is mainly used in nuclear power plants due to its unique nuclear properties.
- Naturally occurring uranium consists of 99% uranium-238 and 1% uranium-235. Uranium-235 is the only naturally occurring fissionable fuel (a fuel that can sustain a chain reaction). Uranium fuel used in nuclear reactors is enriched with uranium-235.
- Depleted uranium is also used as a shield against radiation in medical processes using radiation therapy and also while transporting radioactive materials.
- Uranium is also used by the military to power nuclear submarines and nuclear weapons.

**Distribution of Uranium Across World**

- Over two-thirds of the world's production of uranium from mines is **from Kazakhstan, Canada and Australia.**
- Olympic Dam and the Ranger mine in Southern Australia are important mines in Australia.
- **High-grade deposits are only found in the Athabasca Basin region of Canada.**
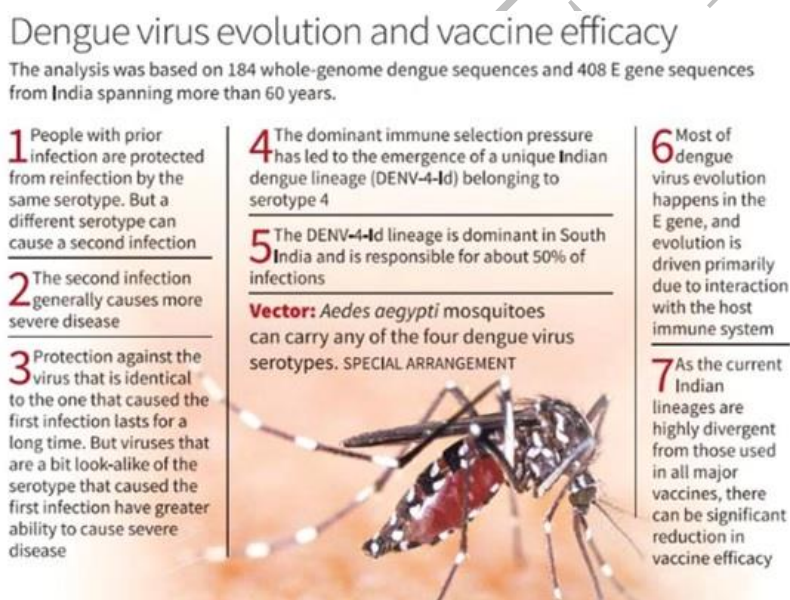
**Uranium In India**

- India produces about 2 percent of the world's uranium. The total reserves of uranium are estimated at 30,480 tonnes.
- **India has no significant reserves of Uranium**. **All needs are met through imports**. India imports thousands of tonnes of uranium from Russia, Kazakhstan, France.
- India has **22 reactors with an installed capacity of 6,780 megawatts**. Of these, eight reactors are fuelled by indigenous uranium while the remaining 14 are under IAEA safeguards and qualify to use imported uranium.

## 19. Evolution of dengue in India

**Concept :**

- A team of researchers from the Indian Institute of Science has **analysed the evolution and diversity of dengue virus in India** by **studying 184 whole-genome dengue sequences and 408 E gene sequences spanning over 60 years.**
- Researchers have found that the **cross-protection offered by the first infection with any of the four dengue serotypes starts to wane after two to three years**, and the **virus that is similar to the serotype that caused the first infection has a greater ability to cause severe disease than the other serotypes.**
- This is because while the **antibodies are not able to neutralise the virus belonging to different serotypes,** the virus is better able to bind to the antibodies leading to higher cell infection and thus enhanced severity and viral load.
- This is called the **antibody-dependent enhancement mediated by cross-reactive antibodies**.
- The dominant immune selection pressure has led to the **emergence of a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4(DENV-4)**.
- They identified a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4 (DENV-4) that is **dominant in South India**, and about 50% of infections in South India are due to this lineage.
- The researchers also found that the evolution of the viruses across serotypes has implications in vaccine efficacy as the current Indian lineages are highly divergent from those used in all major vaccines.



Dengue virus evolution and vaccine efficacy

The analysis was based on 184 whole-genome dengue sequences and 408 E gene sequences from India spanning more than 60 years.

1 People with prior infection are protected from reinfection by the same serotype. But a different serotype can cause a second infection

2 The second infection generally causes more severe disease

3 Protection against the virus that is identical to the one that caused the first infection lasts for a long time. But viruses that are a bit look-alike of the serotype that caused the first infection have greater ability to cause severe disease

4 The dominant immune selection pressure has led to the emergence of a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4

5 The DENV-4-Id lineage is dominant in South India and is responsible for about 50% of infections

**Vector:** *Aedes aegypti* mosquitoes can carry any of the four dengue virus serotypes. SPECIAL ARRANGEMENT

6 Most of dengue virus evolution happens in the E gene, and evolution is driven primarily due to interaction with the host immune system

7 As the current Indian lineages are highly divergent from those used in all major vaccines, there can be significant reduction in vaccine efficacy

*For further notes on Dengue, refer – https://optimizeias.com/dengue/*

## 20. Methyl groups enhance key properties of PHA plastics

**Concept :**

- A class of polyesters considered a promising alternative to common plastics have now been made more mechanically tough and thermally stable.
- Researchers replaced the reactive hydrogens in the monomer of these materials —**polyhydroxyalkanoate (PHA) plastics —** and found that it enhanced PHA thermal and mechanical properties and enabled closed loop chemical recyclability.
- The new approach (Science) could provide a route for **increased use of sustainable PHA plastics.**

**About PHA Plastics**

- PHA (polyhydroxyalkanoates) plastic is a **type of biodegradable plastic that is made from renewable resources,** such as **plant starches and oils.** In contrast, traditional plastic is typically made from non-renewable resources, such as petroleum.
- **Plastics can also be produced from starch, a natural polymer**. Microorganisms transform this natural polymer to lactic acid, which is chemically treated to produce a plastic, **polylactide (PLA)-** Another option for sustainable plastics- But this is an expensive method.

- Biodegradable plastic products currently in the market are about two to 10 times more expensive than traditional plastics.
- Unlike production of PLA and **PHA made by fermentation**, **producing PLA through crops will involve competition for land needed to grow crops** for human consumption.

## 21. Auto immune diseases

**Concept :**

- Evidence suggests that obese individuals have a higher risk of developing autoimmune diseases such as type 1 diabetes.
- A possible mechanism that could explain this connection — metabolic overload that suppresses immunoregulation and induces inflammatory responses, thereby increasing the risk of autoimmunity.

**Auto Immune Diseases**

- Autoimmune diseases **arise from an abnormal immune response of the body against substances and tissues normally present in the bod**y (autoimmunity). This may be restricted to certain organs or involve a particular tissue in different places.
- A large number of autoimmune diseases are recognized.
- It has been **estimated that autoimmune diseases are among the top ten leading causes of death among women in all age groups up to 65 years**. A substantial minority of the population suffers from these diseases, which are often chronic, debilitating, and life-threatening. There are more than 80 illnesses caused by autoimmunity.
- Normally our **immune system produces proteins called antibodies that protect the body from these invaders.**
- **Autoimmune means our immune system cannot tell the difference between these foreign invaders and our body's healthy tissues** ("auto" means "self") and creates auto-antibodies that attack and destroy healthy tissue. These auto-antibodies cause inflammation, pain, and damage in various parts of the body.
- The treatment of autoimmune diseases is typically with immunosuppression—medication that decreases the immune response.

## 22. Endometriosis

**Concept :**
**Endometriosis**

- Endometriosis is a disease **in which tissue similar to the lining of the uterus grows outside the uterus**. It can cause severe pain in the pelvis and make it harder to get pregnant.
- Endometriosis can start at a person's first menstrual period and last until menopause.
- With endometriosis, tissue similar to the lining of the uterus grows outside the uterus. This leads to inflammation and scar tissue forming in the pelvic region and (rarely) elsewhere in the body.
- The **cause of endometriosis is unknown**.
- There is **no known way to prevent endometriosis.** There is no cure, but its symptoms can be treated with medicines or, in some cases, surgery.
- Endometriosis **affects roughly 10% (190 million) of reproductive age women and girls globally.**
- It is a **chronic disease** associated with severe, life-impacting pain during periods, sexual intercourse, bowel movements and/or urination, chronic pelvic pain, abdominal bloating, nausea, fatigue, and sometimes depression, anxiety, and infertility.

**Diagnosis Delay**

- A careful history of **menstrual symptoms and chronic pelvic pain provides the basis for suspecting endometriosis.**
- Although several screening tools and tests have been proposed and tested, **none are currently validated to accurately identify or predict individuals or populations** that are most likely to have the disease.
- Endometriosis can often present symptoms that mimic other conditions and contribute to a diagnostic delay.
- Ovarian endometrioma, adhesions and deep nodular forms of disease often require ultrasonography or magnetic resonance imaging (MRI) to detect.
- Histologic verification, usually following surgical/laparoscopic visualization, can be useful in confirming diagnosis, particularly for the most common superficial lesions.
- The need for histologic/laparoscopic confirmation should not prevent the commencement of empirical medical treatment.

## 23. Existing vaccines versus new variants

**Concept** :

- As COVID19 cases began rising yet again in India in March, many wondered whether the existing vaccines, based on the SARSCoV2 virus that was first reported in China, would still be effective against newer versions of the same virus.

**Two pronged response**

- Vaccines generate a two pronged immune response. The first is the production of antibodies by B cells, a type of white blood cells.

- Antibodies directly attack and destroy viruses. The second is the Tcell response. T cells are another type of white blood cells.
- They have many roles, of which one is to patrol the body and destroy virus infected cells. Both these arms also give rise to specialised memory cells, which are stored away for future needs.
- These two commodities are 'freshly made' by our body following an encounter with the antigen, introduced during vaccination.
- Soon after vaccination, our antibody levels go up. This provides an early window of protection from infection.
- However, the levels of 'freshly made' antibodies start dropping within three months or so, and eventually plateau to a low baseline. This low level is not enough to prevent infection later.

**Why do the levels drop?**

- It is natural for the body to scale down the production of antibodies after the immediate threat has passed.
- If this immune contraction did not occur, our blood would be as thick as grease from all the antibodies produced against every pathogen we have encountered in our lives.
- The gradual drop in the level of antibodies is one reason why people sometimes pick up infections despite vaccination — this can occur even after receivingmultiple booster doses.
- The other reason is that the virus has altered itself, and some of the older antibodies are not able to lock on to the new targets.

**Role of T cells in prolonged Immunity**

- Like **B cells, which produce antibodies**, **T cells are central players in the immune response to viral infection.**
- For your immune system to fight off any kind of invader, such as a virus, you need a kind of white blood cell called a B cell, which makes antibodies, and a similar-looking white blood cell called a T cell.
- T cells can play different roles altogether.
- They can act as "**killer cells**," attacking cells which have been infected with a virus or another kind of pathogen, or they can act as "helper cells" by supporting B cells to produce antibodies.

**How do they function?**

- Alongside antibodies, the immune system produces a battalion of T cells that can target viruses.
- Some of these, known as killer T cells (or CD8+ T cells), seek out and destroy cells that are infected with the virus.
- Others, called helper T cells (or CD4+ T cells) are important for various immune functions, including stimulating the production of antibodies and killer T cells.
- T cells do not prevent infection, because they kick into action only after a virus has infiltrated the body. But they are important for clearing an infection that has already started.
- In the case of COVID-19, killer T cells could mean the difference between a mild infection and a severe one that requires hospital treatment.

**What did the latest research find?**

- The researchers found that neutralising antibodies were detectable even 12 months after infection in "most individuals".
- It remained stable 6-12 months after initial infection in people younger than 60 years.
- The researchers found that "multifunctional T cell responses were detected for all SARS-CoV-2 viral proteins tested".
- And most importantly, the magnitude of T cell responses did not show any difference immaterial of how severe the disease was.
- While the ability of antibodies to neutralise was nearly absent against the Beta variant, it was reduced in the case of the Delta variant.

**Neutralizing antibodies**

- SARS-CoV-2-specific neutralising antibody and T cell responses were retained 12 months after initial infection.
- Neutralising antibodies to the D614G, Beta, and Delta were reduced compared with those for the original strain, and were diminished in general.
- Memory T cell responses to the original strain were not disrupted by new variants.
- The findings show that robust antibody and T cell immunity against SARS-CoV-2 is present in majority of recovered patients 12 months after moderate-to-critical infection.

**Robustness of antibodies**

- The study reveals the durability and robustness of the T cell responses against variants, including Delta, even after one year of infection.
- Most importantly, the robust and longstanding T cell responses were seen in people who have not been reinfected or vaccinated.
- This would mean even in the absence of vaccination, a person who has been infected by the virus even one year ago would have robust immune responses.
- It would offer protection against disease progressing to a severe form requiring hospitalization.

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## 24. Drills test India's COVID 19 Preparedness

**Concept :**

- India began a two-day COVID 19 preparedness drill , amid the continuing surge in cases.
- A senior Health Ministry official said the drill was aimed at reviewing and ensuring proper arrangements for testing and treatment of patients.
- Drills were conducted at all major government and private hospitals across Rajasthan, Madhya Pradesh, Bihar, Karnataka, and Mumbai.
- The Ministry said the spike in cases witnessed recently could be attributed to the newly emerged **recombinant coronavirus variant XBB.1.16.**

### SARS-CoV-2 XBB.1.16 Lineage

- An Omicron variant of the coronavirus namely XBB.1.16, which is a recombinant virus of Omicron has been attributed to a recent spike in covid cases in India.

### How is XBB.1.16 Lineage Cause for Concern?

- The XBB.1.16 variant has been detected in around 14 countries across the world and the earliest sequence of this lineage originated in a viral genome detected in NewYork.
- The **1.16 lineage evolved from the XBB lineage** and is a **recombinant lineage of the SARS-COV2 virus.**
- **XBB is an Omicron sublineage** and it is currently the most prevalent one among the Omicron variants.
- The **1.16 lineage also has various mutations** and initial data suggest that this variant has a superior advantage when compared with other SARS-CoV-2 lineages including XBB.1.5 lineage.
- In the middle of an uptick in seasonal influenza H3N2 cases, there is also a spike in COVID-19 cases in March 2023 despite a low number of tests conducted.
- The total number of cases increased to 6000 in India and XBB.1.16 lineage is considered to be the reason behind the spike in cases.
- **Genomic surveillance data also reveals that XBB.1.16 accounts for more than 30% of all sequenced genomes in march 2023** and its **share of infection is increasing**.
- Preliminary data suggest that there is **no difference in clinical severity between XBB.1.16 and other Omicron variants,** but there is a **chance of a higher risk of reinfection with XBB.1.16 lineage** due to its fast-growing ability.
- Hence it is important to monitor the spread of this XBB.1.16 lineage if the Covid-19 cases continue to increase.

## 25. Central Equipment Identity Register

**Context**: The CIER initiative was started by the DoT in Maharashtra in 2017 to address the issue of the theft of mobile phones as well as the growing number of counterfeit mobile phones in the market.

### CIER initiative

- It is essentially an equipment identity register that tracks the International Mobile Equipment Identity Register (IMEIR), the unique 15-digit identification code for each mobile device.
- Using the IMEIR, the CIER project can block mobile devices that have been reported to be stolen and facilitate recovery of the mobile device by local police if the stolen device is activated. This will protect the valuable data of the consumer present on the device. Similarly, counterfeit mobile phones can also be identified since they don't have these unique IMEIR.
- TAF-COP is also set for a pan India expansion, and might be consolidated with CIER.
- **What is TAF-COP**
- TAF-COP is a cybersecurity project that notifies consumers about all the mobile phones listed under an Aadhar number.
- Consumers can enter their Aadhar number into the TAF-COP portal and get a detailed account of mobile phone connections registered under their name.
- In case there is fraudulent registration of mobile numbers under a person's name, they will be able to regularise the matter.
- At present, TAF-COP is live in Andhra Pradesh, Kerala, Rajasthan, Telangana, Jammu and Kashmir, Ladakh, Meghalaya, Tripura, Mizoram, Arunachal Pradesh, Nagaland, Manipur, Andaman and Nicobar Islands, Chandigarh, Lakshadweep and Puducherry. However, DoT is planning to expand TAF-COP nationwide by May as well.

## 26. Indian Space Association

**Concept :**

- CDS Gen. Anil Chauhan has said that the world is witnessing the militarissation of space at the **Indian DefSpace Symposium organised by the Indian Space association (ISpA) in association with DRDO.**
- According to the CDS (General Anil Chauhan), the very nature of warfare is on the cusp of major transformation with space being used to enhance combat capabilities in land, sea and cyber domains

**Militarisation Of Space**

- It refers to the **use of outer space for military purposes,** including the deployment of military assets such as satellites, weapons, and communication systems.
- The term generally refers to the integration of space capabilities into military planning and operations, as well as the use of space-based assets for intelligence gathering, surveillance, and navigation.

**Weaponisation Of Space**

- The Weaponisation of Space refers to the **development and deployment of weapons systems in outer space.** It is the **next level of militarisation** and envisages a situation where space is being used for military warfare. In this term, it can be said that space becomes the new frontier of war.

**Initiatives by India towards the militarisation of space**

- In 2019, India concluded the **first table-top joint war game called 'IndSpaceEx**' – run by the **military and space scientists**.
- Demonstration of **India's Anti-Satellite (ASAT) capability** under **Mission Shakti.**
- Establishment of the **new tri-service Defence Space Agency (DSA**) – tasked with operating the space-warfare and Satellite Intelligence assets of India.
- **Mission DefSpace** was launched in 2022 for the development of innovative solutions in the space domain by the industry.
- **Indian DefSpace Symposium, organised by the Indian Space Association (ISpA) and the DRDO** under Mission DefSpace, to **create a platform for all stakeholder**s who have a keen interest in boosting India's military space capability and plans.
- **Indian Space Association (ISpA) is** a **voluntary association of leading space industries** established with the objective of providing advisory and advocacy support to the space industry in India.

**Indian Space Association (ISpA):**

- ISpA aspires to be **the collective voice of the Indian Space industry** ISpA will be **represented by leading domestic and global corporations** that have advanced capabilities in space and satellite technologies.
- ISpA will undertake Policy Advocacy and engage with all stakeholders in the Indian Space domain, including the Government and its Agencies, to make India self-reliant, technologically advanced and a leading player in the space arena.
- ISpA will also work towards building global linkages for the Indian space industry to bring in critical technology and investments into the country to create more high skill jobs.

**Significance of ISpA:**

- One of the main goals of the organisation is to supplement the government's efforts towards making India a global leader in commercial space-based excursions.
- Of late, ISRO's rockets have been carrying the payload and communication satellites of various countries; now, private players will also look to touch on this space with the new organisation.
- Several private sector companies have shown an interest in India's space domain, with space-based communication networks coming to the fore.

**Other Related Organisations:**

- **IN-SPACE**:
- **Indian National Space Promotion and Authorization Centre (IN-SPACe)** was approved in 2020 to provide a level playing field for private companies to use Indian space infrastructure.
- **NSIL:**
- **In** the 2019 Budget, the government had announced the setting up of a **New Space India Limited (NSIL)**, a public sector company that would serve as a marketing arm of ISRO (Indian Space Research Organisation).
- Its main purpose is to market the technologies developed by ISRO and bring it more clients that need space-based services.
- That role, incidentally, was already being performed by Antrix Corporation, another public sector undertaking working under the Department of Space, and which still exists.

## 27. India's first 3D-printed post office

**Concept :**
**About 3D-printed post office:**

- It is located in Cambridge Layout in Ulsoor, Bangalore.
- It is **being implemented by Larsen & Toubro**, which has experience in constructing 3D-printed buildings.
- It is a 1,100 sqft building which is expected to cost 30-40 per cent less than conventional buildings because of the technological intervention.
- It is being built at a cost of Rs 23 lakh.

**What is 3D-printing?**

- **3D printing, or additive manufacturing**, is the **construction of a three-dimensional object from a CAD model or a digital 3D model**
- The term "3D printing" can refer to a variety of processes in which material is deposited, joined or solidified under computer control to create a three-dimensional object, with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer.
- 3D printing starts by making a virtual design of the object to be created. Virtual design can be made using a 3D modelling program such as CAD (Computer Aided Design) or 3D scanners.
- The 3D digital copy is then put into a 3D modelling program. The model is then sliced into hundreds or thousands of horizontal layers in preparation for printing.
- This prepared file is thus uploaded in the 3D printer which reads each slices in 2D format and then proceeds to create the object layer by layer and the resulting object has no sign of layering visible, but a 3 dimensional structure.
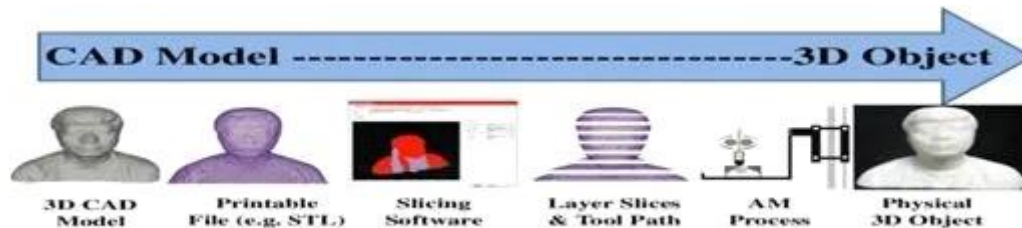


**28. 6 GHz band spectrum for Wi-Fi to drive broadband penetration**

**Concept :**

- New Delhi-based policy think tank Broadband India Forum (BIF) on Tuesday said the spectrum in the 6 **GHz band is crucial for Wi-Fi and the same is required to drive broadband penetration across the country.**
- **The 6 GHz band includes 1200 MHz spectrum in the range of 5.9-7.1 GHz**. According to National Frequency Allocation Plan 2022, the **spectrum in the band is allocated for fixed satellite and mobile services.**
- BIF has conducted a very exhaustive study for co-existence in the 6GHz band based on actual data, which has conclusively proved **that Wi-Fi can co-exist with incumbent users of Fixed Services (FS) and Fixed Satellite Service**s (FSS) in the band.
- However, Broadband India Forum and other experts believe that the **government should either delicense the complete spectrum available in the 6 GHz band for Wi-Fi or at least give part of the spectrum.**

**Need for allocating the spectrum to WiFi :**

- Given that **public Wi-Fi is the way to accelerate broadband penetration** across the country, liberalisation of public Wi-Fi through the PM-WANI scheme is one of the important steps to help achieve the government of India's vision of Digital India and to attain the objectives of providing **'Broadband for all'**.
- Allocating the spectrum for Wi-Fi include indoor coverage of internet better than mobile networks, boost innovations including artificial intelligence (AI) and virtual reality, etc, using Wi-Fi6E and Wi-Fi 7 technologies, mobile data offloading on Wi-Fi in areas with lower telecom coverage, among others.

*For further notes on spectrum allocation, refer* – https://optimizeias.com/spectrum-2/

**29. Large Hadron Collider**

**Concept :**
**Large Hadron Collider (LHC)**

- The Large Hadron Collider is a giant, complex machine built to study particles that are the smallest known building blocks of all things.
- LHC is a **collider that accelerates two beams of particles in opposite directions and smashes them head-on.**
- These **beams of particles are Hadrons**.
- Hadron is a **subatomic particle** made of **quarks, gluons and anti-quarks.**
- **Hadrons are the heaviest particles** and are **composed of two or more quarks** that are **held strongly by electromagnetic force**.
- LHC is built by the **European Organization for Nuclear Research (CERN).**

**Functioning of Large Hadron Collider**

- The LHC uses Protons, which are made up of quarks and gluons and it energises the protons by accelerating them through a **narrow circular pipe that is 27 km long.**
- This circular pipe encircles two D-shaped magnetic fields, created by close to 9,600 magnets.

- In the pipe, Protons are made to move by turning on one hemisphere of magnets and turning off the other and once it reaches a specific position the magnetic polarity is reversed by turning off the first hemisphere and turning on the second.
- This makes the Proton move in an anticlockwise direction and by switching the direction of the magnetic field rapidly, Protons are accelerated through the beam pipe.
- There are a few other components placed in the pipe that ensure that the particles do not hit the pipe's walls.
- This process makes the Protons move at 99.999999% of the speed of light which helps them accrue a tremendous amount of energy as per the special theory of relativity.
- When two antiparallel beams of energised particles collide head-on, the energy at the point of collision is equal to the sum of the energy carried by the two beams.
- At the time of the collision, chaos is witnessed and parts of energy coalesce into different subatomic particles based on the fundamental forces of nature.
- The particles take shape depending on the amount and flavour of energy available and which other particles are being created or destroyed around them.
- A few particles are created very rarely i.e. are created with a probability of 0.00001%.
- A few other particles are quite massive and require the right kind of energy to be created.
- A few other particles are extremely short-lived and the detectors studying them need to record them in a similar timeframe.
- The LHC is built in such a way that scientists can alter all these parameters to study different particle interactions.

## The Findings of the LHC

- The LHC has nine detectors that are placed at different points on the beam pipe. These detectors are used to study particle interactions in different ways.
- Annually, these detectors generate close to 30,000 TB of data worth storing, Physicists filter this data with the help of computers to identify and analyse specific patterns.
- This is similar to how **the ATLAS and CMS detectors helped discover the Higgs boson**.
- The LHC is known for accelerating a beam of hadronic particles to certain specifications and delivering it which facilitates scientists to do different things with the beam.
- With the help of data generated from all these collisions, researchers have tested the predictions **of the Standard Model of particle physics, the reigning theory of subatomic particles, observed exotic particles such as pentaquarks and tetraquarks and examined the extreme natural conditions that existed right after the Big Bang**.

## Latest Upgrade:

- This is **the LHC's third run**, it will operate round-the-clock for four years at unprecedented energy levels of 13 tera electron volts. (An electron volt is the energy given to an electron by accelerating it through 1 volt of electric potential difference).
- Scientists are aiming to be delivering 1.6 billion proton-proton collisions per second" for the ATLAS and CMS experiments.
- **ATLAS**: Largest general purpose particle detector experiment at the LHC.
- **Compact Muon Solenoid (CMS) experiment:** one of the largest international scientific collaborations in history, with the same goals as ATLAS, but which uses a different magnet-system design.

**For further details, refer** – https://optimizeias.com/hint-of-an-elementary-particle-vanishes-under-lhc-scrutiny/

## 30. Graphene

**Concept :**

- **Graphene** is a one-**atom-thick sheet of carbon atoms** arranged in a honeycomb-like pattern. It is an is an allotrope of carbon. Graphene is considered to be the world's thinnest, strongest and most conductive material – of both electricity and heat.
- **Properties:** It is harder than diamond yet more elastic than rubber; tougher than steel yet lighter than aluminium. Graphene is the strongest known material.
- **Other Properties of Graphene are**:
- Lowest resistivity substance known at room temperature.
- High thermal stability.
- High elasticity.
- High electrical conductivity.
- Electron mobility is high at room temperature.
- Graphene oxide (GO) membranes can be used to filter common salt from seawater.
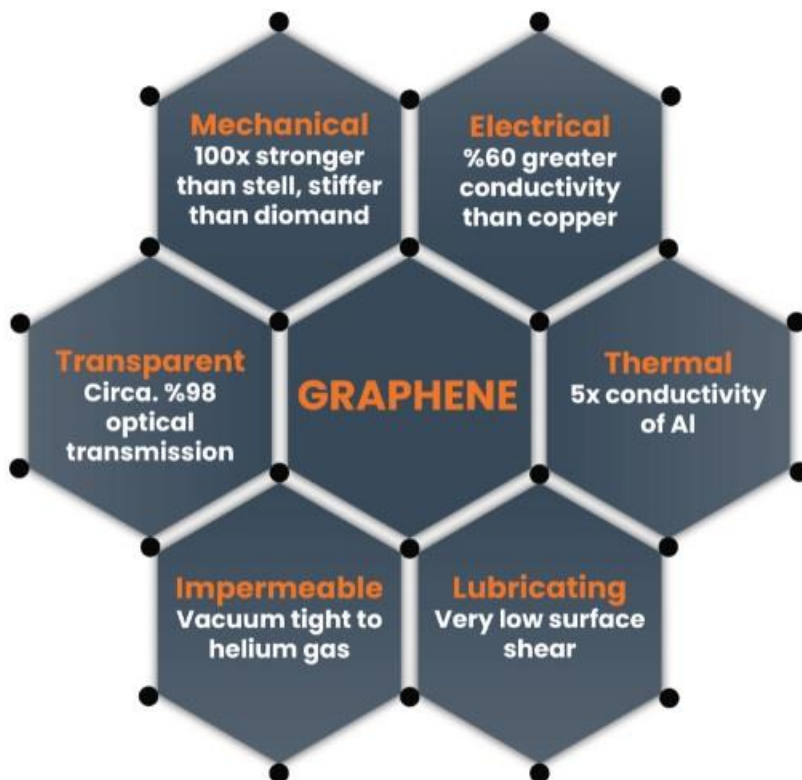
**Applications of graphene/GO/rGO**

- Graphite and its derivate recently gained science and engineering awareness due to its numerous applications.
- The discovery of graphene is rightly regarded as a milestone in the world of material science; as can be seen in the worldwide attention, the material has received in the fields of electronics, photonics, capacitors/supercapacitors, biosensing, etc.
- They are used in numerous applications as illustrated below. In this book, applications of graphene and its derivatives are discussed in detail.
- These applications include **photocatalysis, electronics, gas sensing, graphene-based heterogeneous electrodes for energy storage devices, etc. In addition, sound devices based on graphene is also explained in this book.**
- **Carbon Allotropes:** Diamond, graphite and fullerenes (substances that include nanotubes and buckminsterfullerene) are the important allotropes of pure carbon.
- Allotropy is the property of some chemical elements to exist in two or more different forms, in the same physical state.

**31. Jupiter Icy Moons Explorer (Juice) mission**

**Concept :**

- The European Space Agency (ESA) is all set to launch the Jupiter Icy Moons Explorer, or Juice, mission from its spaceport in French Guiana on an Ariane 5 launcher.

**About Juice Mission**

- It is planned to **reach Jupiter in 2031**.
- The **mission aims to carry out a detailed exploration of Jupiter and its icy moons – Ganymede, Callisto and Europa**, which potentially have habitable environments.
- The main focus will be on **Ganymede, as it is the largest moon in the Solar System** and the **only one to generate its own magnetic field**.
- Another primary goal of the mission is to **create a comprehensive picture of Jupiter** by trying to understand its origin, history and evolution.
- Juice will also analyse the chemistry, structure, dynamics, weather, and climate of Jupiter and its ever-changing atmosphere.
- However, **Juice isn't equipped to detect life.**
- It is capable of is finding out whether there could be places where the necessary conditions, such as water, biological essential elements, energy, and stability, to sustain life are present.
- **Other spacecraft to Jupiter:**
- Only two other spacecraft have ever examined Jupiter:
- the **Galileo probe**, which orbited the gas giant between 1995 and 2003, and

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- **Juno,** which has been circling the planet since 2016.

**Europa Clipper:**

- By the time Juice reaches Jupiter, another spacecraft, **NASA's Europa Clipper, would already be orbiting the planet.**
- It is **scheduled to be launched in 2023.**
- It would arrive at Jupiter in 2030 and aims to study its Europa moon.

## 32. Bioluminescence

**Concept : Biotechnology**

- A stretch of the beach at Bheemili near Visakhapatnam glows due to bioluminescence.

**Bioluminescence**

- Bioluminescence occurs **mainly due to the presence of single-celled organisms called dinoflagellates that produce light** when disturbed.
- Various other marine species such as **sponges, jellyfish, worms, species of fish, arthropods, echinoderms and unicellular alga also exhibit bioluminescence.**
- Bioluminescence is a **type of chemiluminescence**, i.e. it **involves a chemical reaction which produces light.**
- Such chemical reactions involve two unique chemicals **namely luciferin and luciferase.**
- **Luciferin is the compound that produces light** and it acts as the substrate.
- **Luciferase is an enzyme or a catalyst** that interacts with a substrate to affect the rate of a chemical reaction.
- Photoprotein can also act as a catalyst in such reactions.
- The phenomenon of **bioluminescence on beaches** is seen to be a **natural phenomenon.**
- Bioluminescence is a "cold **light".**
- Cold light means less than 20% of the light generates thermal radiation or heat.
- In the case of Visakhapatnam, **bioluminescence is said to be a result of an algal bloom of the dinoflagellate species** of noctiluca and ceratium.
- Bioluminescence has been witnessed on some other beaches in India including **Havelock Island in the Andamans, Thiruvanmiyur Beach in Chennai, Mattu Beach in Karnataka, Bangaram Island in Lakshadweep and Kerala's Kumbalangi**.

**Implications**

- **Bioluminescence may not be harmful to humans but it can have significant implications on the marine ecosystem** as phytoplanktons are consumed by fish and the harmful algal blooms have led to mass mortality of fish species in the past.
- Further, the rapid algal growth of noctiluca is attributed to environmental changes such as sudden low salinity or disturbance by pollutants.

## 33. NISAR satellite to map Himalayas' seismic zones

**Concept :**

- **NISAR satellite** is **going to map the most earthquake-prone regions in the Himalayas** with unprecedented regularity and aims to build an advance warning system of land subsidence and earthquakes.

**Need of the initiative:**

- A **large section of the Himalayan region falls in Zone V,** implying **the highest risk** of strong earthquakes.
- The NISAR satellite will use two frequency bands: **the L-band and S-band to image the Himalayan region.**
- These two frequency bands will together provide high-resolution, all-weather data from the satellite that is expected to follow a sun-synchronous orbit.
- **Frequency to map**:
- The seismically active Himalayan region that will, every 12 days, create a "deformation map".
- The map is going Map the Strain which refers to the deformation that occurs in rocks when it is under pressure from other rocks, usually due to movements of continental plates that are sliding, colliding, or subducting against each other.
- **Note** : The Indian Plate collided into the Eurasian plate forming the Himalayas and continues to incrementally push it upwards.
- Scientists from the **Geological Survey of India in 2021 published a "strain map" of the Himalaya**s based on data from 1,252 GPS stations along the Himalayas.
- It **identified regions that had the greatest odds of generating earthquakes of magnitude above 8 and their extent.**

**Significance**:

- It will also serve as a valuable tool to give warning of land subsidence as scientists can use the data collected and under all-weather conditions to study deformation patterns.

- The geoscience community can use this to determine how strain is building up in various parts of the Himalayas.

**About NISAR**:

- NISAR stands for NASA-ISRO Synthetic Aperture Radar.
- NISAR satellite was **jointly developed by the Indian Space Research Organisation (ISRO) and the National Aeronautics and Space Administration (NASA) of the U.S.**
- NISAR is expected to be launched in January 2024 from Satish Dhawan Space Centre into a near-polar orbit.
- It is an **Earth observation satellite**.
- The 2,800 kilograms satellite consists of both L-band and S-band synthetic aperture radar (SAR) instruments, which makes it a dual-frequency imaging radar satellite.
- NASA has provided the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem.
- And the ISRO has provided the S-band radar, the GSLV launch system and spacecraft.
- Another important component of the satellite is its large 39-foot stationary antenna reflector
- It is made of a gold-plated wire mesh, the reflector will be used to focus the radar signals emitted and received by the upward-facing feed on the instrument structure.

**34. Oseltamivir-resistant H1N1 virus**

**Context:** Oseltamivir-resistant H1N1 virus can transmit from wild ducks to chickens.
**More on the News:**

- When the influenza burden is high during certain years, the amount of antiviral oseltamivir used will be high. Much of it **enters the water system** and will **end up driving antiviral resistance in avian viruses**.
- Previous work has demonstrated that influenza virus can **develop resistance to oseltamivir carboxylate** (OC) when the virus infects wild ducks that are **exposed to environmental-like OC concentrations** suggesting that environmental resistance is a concern.
- Avian influenza strain H1N1 with the **OC resistance mutation** (NA-H274Y) has been found **to retain resistance even when the environment did not contain oseltamivir carboxylate**, suggesting maintained fitness of the virus.
- If wild birds, **wild ducks** in particular, are the **first to be infected by influenza virus** brought in by migratory birds, **domestic poultry act as an important amplifying host**, and a source of influenza virus evolution. The **virus that has evolved can then spread from poultry birds to humans.**
- A study recently published in the Journal of General Virology has demonstrated that oseltamivir-resistant strain can transmit from wild ducks to chickens and then spread between chickens, while **retaining the resistance mutation** in an experimental setting mimicking conditions suitable for natural transmission.
- Results demonstrate that regardless of the oseltamivir-resistance mutation, infection was detected in experimentally-infected chickens and chickens in contact with infected mallards.
- According to the authors, this **may be due to poor species adaptation** of the virus.
- Researchers found that mutation (NA-H274Y) that renders the **virus resistant to oseltamivir carboxylate can remain stable in an environment even when oseltamivir carboxylate was not present.**
- And there is **no barrier to interspecies transmission** of the antiviral-resistant virus per se, thus demonstrating a risk of an oseltamivir-resistant pandemic virus.
- The study turns the spotlight on **responsible use of oseltamivir and surveillance for resistance development** to limit the risk of an oseltamivir-resistant pandemic strain.

**Oseltamivir**

- Oseltamivir is an antiviral medication used in the treatment and prophylaxis of **influenza A and B.**
- It belongs to the class of neuraminidase inhibitors, **which work by blocking the action of the viral enzyme neuraminidase.** This **prevents the release of new viruses from infected cells**, and helps to reduce the severity and duration of influenza symptoms.
- The **Centers for Disease Control and Prevention** (CDC) recommends that clinicians use their discretion to **treat those at lower risk who present within 48 hours of first symptoms of infectio**
- It is also sometimes **used in the prevention of influenza in people who have been exposed to the virus but are not yet showing symptoms**.

**35. Magnetoresistance**

**Context:** Recently, researchers in the UK, led by Nobel laureate Andre Geim have found that graphene displays an anomalous giant magnetoresistance (GMR) at room temperature.
**Magnetoresistance:**

- GMR is the **result of the electrical resistance of a conductor being affected by magnetic fields** in adjacent materials.

- Say a **conductor is sandwiched between two ferromagnetic materials** (commonly, metals attracted to magnets, like iron). When the **materials are magnetised** in **the same direction**, the **electrical resistance in the conductor is low**. When the **directions are opposite each other**, the **resistance increases**. This is GMR.
- GMR-based devices are particularly **used to sense magnetic fields.**
- It is **used in harddisk drives and magnetoresistive RAM in computers**, biosensors, automotive sensors, microelectromechanical systems, and medical imagers.
- The **2007 Nobel Prize in Physics** was awarded to Albert Fert and Peter Grünberg for the discovery of GMR

**Findings of the Study:**

- In their study, the magnetoresistance in monolayer graphene at 27° C held between two layers of boron nitride increased by 110% under a field of 0.1 tesla. To compare, the magnetoresistance in these conditions increases by less than 1% in normal metals.
- The **magnetoresistance observed in the graphene-based device was almost 100-times higher** than that observed in other known semimetals in this magnetic field range
- The new study has found that a **graphene-based device**, unlike conventional counterparts, **wouldn't need to be cooled to a very low temperature to sense these fields.**

More about Graphene: https://optimizeias.com/graphene/

## 36. What to know about first test flight of SpaceX's big Starship

**Context:**

- **Elon Musk's SpaceX** is about to launch the first test flight of its mammoth Starship.
- It's the biggest and mightiest rocket ever built, with the lofty goals of ferrying people to the moon and Mars.

**About SpaceX Starship:**

- Starship is a fully reusable spacecraft designed and built by SpaceX with the primary goal of sending humans to the Moon, Mars, and beyond.

**Key objectives**

- **SpaceX** aims to use Starship to establish a **self-sustaining human settlement on Mars.**
- The ultimate goal is to enable humans to become a multi-planetary species.
- It also aims to make Starship reusable, reducing the cost of spaceflight and bringing down the price to a few million dollars per flight.
- In the long run, the company aims to achieve full and rapid reusability of the spacecraft.

**Features:**

1. **Design and configurability:**
   - **Made up of two parts:** a **50-meter tall spacecraft** and a **70-meter tall Super Heavy rocket booster.**
   - Spacecraft has **six Raptor engines;** Super Heavy Booster has 28 Raptor engines.
   - **Payload capacity** of up to **250 metric tons** and features a large heat shield.
   - Interior can be configured for **up to 100 passengers or cargo.**
2. **Manoeuvrability**
   - Designed to be **fully reusable**, with **vertical take-off and landing on Earth**, **Moon, and Mars.**
   - Can be refuelled in orbit for deeper space travel and for establishing a human settlement on Mars.
3. **Construction and materials**
   - Built using durable and cost-effective stainless steel material.
   - Stainless steel also provides heat protection during re-entry into the Earth's atmosphere.
4. **Power and thrust:**
   - The **stainless steel Starship** has **33 main engines**.
   - Powered by **methane and liquid oxygen** fueled Raptor engines.
   - Generates 17 million pounds of thrust more than twice that of the Saturn V rockets used for the Apollo missions.

**Other competitors:**

- **Jeff Bezos' Blue Origin** is readying the **New Glenn rocket** for its orbital debut from Cape Canaveral, Florida.
- **United Launch Alliance** expects its new **Vulcan rocket** to make its inaugural launch later this year, hoisting a **private lunar lander to the moon** at NASA's behest.
- **Europe's Arianespace** is close to launching its new, upgraded **Ariane 6 rocket** from French Guiana in South America.

## 37. Plant 'cries': Recalling Jagadish Chandra Bose

**Context:**

- Late last month, a group of researchers from **Tel Aviv University** in Israel reported that they had been **able to pick up distress noises made by plants**.

**Details:**

- The researchers said **these plants had been making very distinct, high-pitched sounds in the ultrasonic range when faced with some kind of stress,** like when they were in need of water.
- This was the **first time** that plants had been caught making any kind of noise.

**About Jagdish Chandra Bose:**

- Born on **30th November, 1858** to **Bama Sundari Bose** and **Bhagawan Chandra**, **Bengal.**
- He was a **Plant Physiologist** and **physicist** who invented the **crescograph**, a device for measuring the growth of plants. He for the first time demonstrated that plants have feelings.

**Education:**

- He earned a **BSc** from **University College London**, which was connected with the **University of London in 1883**, and a **BA (Natural Sciences Tripos)** from the **University of Cambridge in 1884.**

**Contributions to science:**

- He made pioneering contributions in both the fields and was the **first Indian to have made a powerful impact on modern science,** much before **Srinivasa Ramanujan, C V Raman, or Satyendra Nath Bose**, a student of **Jagadish**, arrived on the scene.
- Several previous generations of Indians had grown up hearing that **Jagadish Chandra Bose** had shown, more than a century ago, that **plants experienced sensations and were able to feel pleasure and pain just like animals.**
- The discovery that plants **'cry' in distress**, therefore, did not come as much of a surprise to them. It seemed just a logical extension of **J C Bose's work**.
- Bose discovered **wireless communication** and was named the **Father of Radio Science** by the **Institute of Electrical and Electronics Engineering.**
- He was responsible for the **expansion of experimental science in India.**
- Bose is considered the **father of Bengali science fiction.** A crater on the moon has been named in his honour.
- He **founded Bose Institute,** a premier research institute of India and also one of its oldest. Established in **1917,** the Institute was the **first interdisciplinary research centre in Asia.** He served as the **Director of Bose Institute from its inception until his death.**
- To facilitate his research, he constructed automatic recorders capable of registering extremely slight movements, these instruments produced some striking results, such as quivering of injured plants, which Bose interpreted as a power of feeling in plants.

**Books:**

- His books include Response in the Living and Non-Living (1902) and The Nervous Mechanism of Plants (1926).

**His work:**

- Jagadish Chandra Bose is remembered for **two things**
1. his work on **wireless transmission of signals,** and
2. on the **physiology of plants**.
- He is also **credited as one of the first contributors to solid state physics.**
- **Sir Neville Mott, Nobel Prize winner in 1977,** is said to have remarked that Bose was "at least 60 years ahead of his time and he had anticipated the **p-type and n-type semiconductors**".

**Work on radio waves:**

- **Bose** is widely believed to be the **first one to generate electromagnetic signals in the microwave range.**
- In **1895** he demonstrated how microwaves could be used, wirelessly, to ring an electric bell on the other side of a building.
- He published as many as **12 papers on radio waves** in the Proceedings of the Royal Society, and many more in some other prestigious journals.
- He lectured on his work at some highly publicised scientific gatherings in Europe, in the presence of some of the leading scientists of the day.
- He was the first one to come up with **radio receivers,** which enabled wireless telegraphy.
- And yet, **Guglielmo Marconi**, an **Italian scientist** who carried out the first transmission of signals across the Atlantic in 1901, is **recognised as the sole inventor of the radio**.
- **Marconi,** along with another colleague, was awarded the **1909 Nobel Prize** for work that Bose is known to have accomplished earlier.
- It was not just bias but a reluctance on Bose's part to obtain patents for his work, that deprived him of the Nobel.

**Controversies over his work:**

- Some of his work became **controversial as well**, particularly when **he claimed that not just plants, even inanimate inorganic matter could respond to stimulus**, and that **there was actually no sharp demarcation between living and non-living worlds.**
- Such "mental leaps" have sometimes been attributed to **Bose's "deep convictions in Indian philosophy"** and his **"faith in universalism"**.
- Bose regarded plants to be the "intermediates in a continuum that extended between animals and the non-living materials".
- Over the years, much of Bose's work has been confirmed.

## 38. Epigeneres Biotech operationalise the HrC test – an early warning system that picks up cancer signals

**Context:**

- An **early warning system for cancer,** that's the promise of **HrC** or the **Himanshu Roy Cancer test** – a **first-of-its-kind prognostic test for cancer.**

**Details of HrC test:**

- **I**t was **developed by** the city-based **Epigeneres Biotechnology** along with**Singapore-based Tzar Labs,** supported by some marquee investors.
- The test is named after mumbai's top cop Himanshu roy.
- the test involves a **single blood test** that claims to **detect the absence, imminence or presence of cancer.**
- The **test detects all cancers** from a blood test; it catches imminent cancer "very early" and it's "very accurate" of the "stage zero" test that detects a potential cancer risk 18 months earlier, the company claims.
- The test has been launched in India, priced at **sub-₹10,000.** With a capacity of **15 samples daily** the aim is to get to **50-100 samples a day**.
- Besides **cancer survivors**, the test would help people with a family history of cancer or with a risk profile.
- The company is now discussing taking this technology to the United Kingdom and the US.

## 39. National Quantum Mission

**Context:** The Union Cabinet approved the **National Quantum Mission** with an allocation of **₹6,003.65 crore.**
**Details:**

- The mission puts India among the **top six leading nations** that have begun research and development in quantum technologies.
- The **six other nations** which are currently carrying out research and development in the segment include the **US, Canada, China, Austria, Finland and Scotland**.
- The **Union Cabinet** also approved the **Cinematograph (Amendment) Bill 2023** that include provisions to curb transmission of pirated film content on the internet.

**About The National Quantum Mission:**

- The mission **aims** to make India a leading nation in the quantum technology sector and promote economic growth.
- The total cost of the mission is over **six thousand crore rupees.**
- The mission will run from **2023-24 to 2030-31**.
- Union Minister for Science and Technology Dr. Jitendra Singh said that the **mission will give India a quantum jump in the world arena.**
- The **National Quantum Mission** will develop **four broad themes** — Quantum Computing, Quantum Communication, Quantum Sensing and Metrology and Quantum Material and Devices.

**Scope of the mission:**

- The mission will look at development of **satellite-based secure communications between a ground station and a receiver located with 3,000 km** during the first three years.
- For **satellite-based communication within Indian cities**, the National Quantum Mission will lay communication lines using **Quantum Key Distribution** for over **2,000 km.**
- For long distances quantum communication, especially with other countries, tests will be conducted in the coming years.
- The mission will **focus on** developing quantum computers (qubit) with physical qubit capacities ranging between **50 and 1,000 qubits** developed over the next eight years.
- Computers up to **50 physical qubits** will be developed over **three years**, **50 – 100 physical qubits** in five years and computers **up to 1,000 physical qubits** in eight years.

**Significance of the National Quantum Mission:**

- The **National Quantum Mission** will have a **positive impact** on several industries, including communication, health, finance, energy, drug design, and space applications.

- The mission aligns with national priorities such as **Digital India, Make in India, Skill India, Stand-up India, Start-up India, Self-reliant India, and Sustainable Development Goals (SDG).**
- The mission seeks to promote scientific and industrial research and development in Quantum Technology.
- It aims to create a dynamic and innovative ecosystem in the field of quantum technology.
- The mission will facilitate the growth and expansion of quantum technology in India.

**Quantum Technology**

- **About:** Quantum Technology is based on the **principles of Quantum mechanics** that was developed in the **early 20th century** to describe nature at the scale of atoms and elementary particles.
- The **first phase** of this revolutionary technology has provided the foundations of understanding of the physical world and led to ubiquitous inventions such as lasers and semiconductor transistors.
- The **second revolution** is currently underway with the goal of putting properties of quantum mechanics in the realms of computing.



**A Comparison between India and China:**

- **R&D in China:** China started its research and development (R&D) in the field of quantum technology in **2008**.
  - In **2022,** China boasts of developing the **world's first quantum satellite,** creating a **quantum communication line between Beijing and Shanghai,** and **owning two of the world's fastest quantum computers.**
  - This was a result of **decade-long research** carried out in the hope of achieving critical breakthroughs.
- **India: Quantum Technology** remains a field highly concentrated in long-term R&D in India.
  - Just a few hundred researchers, industry professionals, academicians, and entrepreneurs are in the field right now without a constant focus on R&D.

**Quantum Tech and Private Sector:** Large Technology Corporations such as **Google, Microsoft, and IBM** have dedicated programmes for quantum computing and its applications.

- Similarly, several Indian startups such as **QNu Labs, BosonQ, and Qulabs.ai** are also doing remarkable work in developing quantum-based applications for cryptography, computing, and cybersecurity.

**40. Indian scientists find genetic markers associated with premature births**

**What is the research about?**

- For the **first time in South Asia**, Indian scientists working in the **Garbh-Ini programme**, **an interdisciplinary group for advanced research on birth outcomes**, have identified **19 single nucleotide polymorphisms (SNPs),** or **genetic markers**, that have been found to be associated with **preterm — or premature — birth.**

**Details:**

- For the study, the **Garbh-Ini team** undertook a **"genome-wide association study (GWAS)''** on spontaneous preterm birth on 6,211 women from Haryana.
- **Five** of these **SNPs** have been found to **"confer increased risk of early preterm birth (birth before 33 weeks)''** and can predict premature births.
  - The study found that **four SNPs** found in the cohort were **"significantly associated trans-ethnic SNPs"**, which showed association both in **Indian women** as well as in the **women belonging to the European ancestral population.**
  - One of the **SNP markers, rs35760881**, and **three more markers,** when compared with data on **European women,** was found to be also associated with **risk of preterm delivery.**

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- These **SNPs** are known to **regulate important biological processes** such as inflammation, apoptosis, cervical ripening, telomere maintenance, selenocysteine biosynthesis, myometrial contraction, and innate immunity,
- The study also found that **spontaneous preterm birth (sPTB)**, the **major subtype of preterm birth (PTB),** occurs "either due to spontaneous early onset of labour or due to preterm prelabour rupture of membranes".
- **Significance of the study:**
- **Preterm birth** is the **largest cause of neonatal deaths** and complications globally.
  - Preterm births are defined as **births before 37 completed weeks of gestation.**
- Of all babies born annually in India, about **13% are born preterm,** accounting for **23.4% of preterm births globally**.
- When these babies become adults, they also become at higher risk of diseases such as **Type-2 diabetes, hypertension and cancer.**
- When we can predict, through these genetic markers, which women are likely to have preterm births, then these mothers can be monitored closely and triaged.

## Garbh-Ini initiative:

- **Garbh-Ini** is an initiative under the **Department of Biotechnology (Ministry of Sci & Tech)** as a collaborative interdisciplinary programme, led by **DBT-Translational Health Science and Technology Institute (THSTI), NCR Biotech cluster, Faridabad**, in collaboration with **DBT-NIBMG, Kalyani, DBT-Regional Centre for Biotechnology (RCB), Gurugram Civil Hospital and other organisations**.
  - **Objective:** To **identify** c**linical, epidemiologic, genomic, epigenomic, proteomic, and microbial correlates**; discover molecular-risk markers by using an integrative -omics approach; and generate a risk-prediction algorithm for **preterm birth.**

## 41. How AI can help the environment

**Context:** AI has also been touted as a powerful tool to help tackle global crises, such as climate change.
**Details:**
A study commissioned by tech giant **Microsoft** estimated that **AI applications** in the sectors of **agriculture, water, energy and transport** could lead to a **4% cut in greenhouse gas emissions** by **2030** — equivalent to the annual emissions of **Australia, Canada** and **Japan** combined.

**six ways it's being put to use to help the environment:**

1. **Saving trees with AI 'guardians'**
   - Planting acoustic monitoring sensors in forests to detect and track illegal logging and land clearing.
2. **Shrinking the carbon footprint of steel**
   - In mining of raw materials for steel production, AI can be used to optimised and reduce the amount of mined ingredients- or alloys- by upto one third.
3. **Cutting energy waste in buildings**
   - By collecting the data from commercial buildings and aanlysisng them via machine learning, the heating and cooling systems of commercial buildings can be optimised. These tweaks can save **10-30% of the energy used** in a typical commercial building.
4. **Fighting poaching with algorithms**
   - AI based bracelets can be fitted to the animals to track their movement and illegal poaching of vulnerable animals.
5. **Smart farming**
   - AI system can draw on data from solar-powered sensors monitoring the microclimate around crops.
   - These insights can be used to make precise recommendations about plant health and exactly how much water and fertilizer to use. This can both boost yields and reduce wasted resources.
6. **Using computers to plot clouds**
   - The technology can be useful in the field of agriculture, solar energy generation among others.

## 42. A SpaceX rocket exploded soon after launch, but why did Elon Musk and his employees celebrate?

**Context:** After a flight test of its new reusable Starship rocket ended with the craft exploding into smoke and flames.
**Details:**

- The test was the first for the spacecraft manufacturer's Starship spacecraft (the carrier) and Super Heavy rocket (the booster), collectively referred to as **Starship.**
- The Starship represent a fully reusable transportation system designed to **carry both crew and cargo to Earth orbit, the Moon, Mars and beyond.**
- The **flight test failed** due to the **malfunction where the upper-stage Starship failed to separate from the lower-stage Super Heavy rocket**.
- The **celebration is due to the fact** that one of the major objective of getting the vehicle off the ground was achieved with a successful lift-off.

**About SpaceX Starship:**

- Starship is a fully reusable spacecraft designed and built by SpaceX with the primary goal of sending humans to the Moon, Mars, and beyond.

**Key objectives**

- **SpaceX** aims to use Starship to establish a **self-sustaining human settlement on Mars.**
- The ultimate goal is to enable humans to become a multi-planetary species.
- It also aims to make Starship reusable, reducing the cost of spaceflight and bringing down the price to a few million dollars per flight.
- In the long run, the company aims to achieve full and rapid reusability of the spacecraft.

## 43. Optimistic space policy lays out plans to privatise sector

**Concept:**

- The Centre's updated Space Policy, cleared by the Union Cabinet on April 6 but made public recently, has drawn measured optimism from the India's budding private sector start-up space.

**Space Sector of India**

- ISRO has an exceptional success rate and is the 6th largest space agency globally.
- India has over 400 private space companies and ranks fifth globally in terms of the number of space companies.
- The satellite manufacturing capabilities are expected to reach USD 3.2 billion by 2025.
- ISRO also launched a student outreach program called SAMVAD to encourage space research among young minds.

**Indian Space Policy 2023**

- The Indian Space Policy 2023 is a **comprehensive set of guidelines that outlines the roles and responsibilities of different entities in the Indian space sector**.
- The policy is expected to pave the way for much-needed clarity in space reforms and encourage private industry participation in the space economy.
- It aims to encourage and institutionalize private sector participation in India's space sector, with the ISRO primarily focusing on research and development of advanced space technologies.

**Objectives :**

- To augment space capabilities;
- Enable, encourage and develop a flourishing commercial presence in space;
- Use space as a driver of technology development and derive benefits in allied areas;
- Pursue international relations, and create an ecosystem for effective implementation of space applications among all stakeholders.

**Key features of the Indian Space Policy 2023**

- **Creates four distinct, but related entities:**
- The policy creates four distinct, but related entities, that will facilitate greater private sector participation in activities that have usually been the traditional domain of ISRO.
- **These four entities are**:
  - Indian Space Research Organisation (ISRO)
  - IN-SPACe (Indian National Space Promotion and Authorisation Centre)
  - New Space India Limited (NSIL)
  - Department of Space.
- **Role of the IN-SPACe :**
  - As per the policy, IN-SPACe will be the **single-window agency for authorisation of all space activities.**
  - It will also develop space industry standards, promote identified space activities and work with academia to widen the space ecosystem and enable industry-academia linkages.
- **Role of ISRO :**
  - ISRO, meanwhile, has been asked to move away from routine activities and focus on research and innovation.
  - This will mean developing new space technologies and applications in order to maintain India's edge in the areas of space infrastructure, space transportation, space applications, capacity building and human spaceflight.
- **Role of New Space India Ltd :**
  - The government's commercial arm, New Space India Ltd, has been asked to commercialise technologies and platforms created by government entities.
  - It has also been tasked to manufacture, lease, or buy space technologies or assets, and provide space-based services to government as well as private entities.
- **Role of the Department of Space :**
  - The Department of Space has **been asked to implement the policy**, interpret and clarify any ambiguities and establish a framework for safe and sustainable space operations.

- It will be the **nodal department for implementing space technologies**.
- It will also **look after international cooperation and coordination** in the area of global space governance and programmes in consultation with Ministry of External Affairs.
- It has also been tasked to create an appropriate mechanism to resolve disputes arising out of space activity.
- **Enables open satellite data access :**
  - Satellite images with a **ground sample distance (GSD) greater than five metres** (a satellite image where two adjacent pixels represent points five metres apart on the ground) **would be freely available**.
  - However, those with a **GSD less than 30 cm will require INSPACe authorisation** due to national security considerations.
- **Private companies allowed to undertake end-to-end space activity :**
- Private companies, referred to as non-governmental entities in the policy, will be allowed to undertake end-to-end space activity.
- These **activities include** –
- Launching and operating satellites, developing rockets, creating ground stations, building spaceports and mobile launch platforms; and
- Providing services like communication, remote sensing and navigation, nationally and internationally.
- **Other roles envisaged for private entities :**
- Private entities have also been encouraged to develop space situational awareness capabilities.
- **Space situational awareness** capabilities is a mechanism to track objects in space and avoid collision of satellites and space stations with each other or space debris.
- The policy also says that private players can engage in commercial recovery of asteroids or space resources.
- **Private participation will be limited to Indian companies**.
- The question of whether foreign direct investment via the automatic route will be permitted in space is as yet unresolved and pending government approval.

## 44. Stray dog population control is dogged by bad science

**Context:** Recent events of children and other vulnerable section killed by groups of stray dogs have clearly becomes a human rights issue and public health crisis.

**Background:**

- **India** recorded a whopping **160 million cases** of **street/stray dog** bites between **2019 and 2022,** according to data submitted in Parliament till November 2022.
- This has also led to an **increase in revenge crime and atrocities against dogs, feeders of dogs and caregivers** as well as conflicts among urban residents.

**Animal Birth Control or ABC Rules:**

- First introduced in **2000** by **Ministry of Culture**.
- Recently replaced by the **ABC rules 2023**.
- The rules are issued under the **Prevention of cruelty to animal act, 1960**
- The **policy aims** to implement a **technique** called **'catch-neuter-vaccinate-release'** to control populations of free-ranging dogs and cats.
- **Provisions:**
  - The Rules have been formulated in accordance with the guidelines provided by the Hon'ble Supreme Court related to **Animal Welfare Board of India and People for Elimination of Stray Troubles.**
- The **Supreme Court** has specifically mentioned in various orders that **relocation of dogs cannot be permitted.**
  - The Rules aim to provide guidelines for the **sterilisation and immunisation of stray dogs** through **Animal Birth Control (ABC) programmes.**
- The responsibility of carrying out ABC programmes lies with the respective **local bodies, municipalities, municipal corporations, and panchayats.**
- The Municipal Corporations are required to implement the **ABC and Anti Rabies Program jointly.**
  - It provides guidelines on **how to deal with human and stray dog conflicts** without relocating the dogs in an area.
  - It also **emphasises addressing the cruelty involved** in carrying out ABC programmes, **ensuring animal welfare.**

**Drawbacks of the rule:**

- No benchmark has been set for the number of dogs to be sterlized.
- No proper population estimation of stray dogs by municipalities.
- **ABC Rules ban** the **euthanasia of rabid animals**, making **India the only country** in the world to follow such a cruel practice. The rules require rabid dogs to **"die a natural death".**
- **Rabies**
- **Rabies** is a **vaccine-preventable, zoonotic**, **viral disease** affecting the central nervous system.
  - It is present on all **continents except Antarctica,** with over 95% of human deaths occurring in Asia and Africa.

- **Cause:**
- It is caused by a **Ribonucleic Acid (RNA) virus** that is present in the saliva of a rabid animal (dog, cat, monkey, etc).
- It is invariably transmitted following a bite of an infected animal that leads to **deposition of the saliva and the virus in the wound.**
  - **According to WHO,** Dogs are the main source of human rabies deaths, contributing up to **99% of all rabies transmissions to humans.**
- **Status in India:**
- **India is endemic for rabies, and accounts for 36% of the world's rabies deaths.**
- According to WHO, about **30-60% of reported rabies cases and deaths in India occur in children under the age of 15 years** as bites that occur in children often go unrecognised and unreported.

## 45. India conducts successful trials of BMD interceptor missile

**Concept :**

- Recently, The DRDO and Indian Navy successfully conducted a maiden flight **trial of sea-based endo-atmospheric interceptor missile** off the coast of Odisha.
- **India entered an elite club of nations** with the **capability to fire a Ballistic Missile Defense (BMD) interceptor from a naval platform.**
- Prior to this, DRDO has successfully demonstrated land-based ballistic missile defence system with capability to neutralize ballistic missile threats, emerging from adversaries.

**India's Ballistic Missile Defence Programme:**

- India launched the BMD program after Kargil war in 1999 to counter the enemy nation's widening spectrum of ballistic missiles that usually delivered both conventional and nuclear warheads.

**Two-tires of BMD system**
**Prithvi Air Defence missile:**

- It was originally tested in 2006 and is capable of intercepting and destroying missiles at **exo-atmospheric altitudes ranging from 50 to 180 kilometres.**
- The Pradyumna interceptor has already replaced the Prithvi Air Defence BMD.
- Exo-atmospheric missiles are capable of completing missions in the Earth's upper atmosphere.

**Advanced Air Defence Missile:**

- The second layer is Advanced Air Defence (AAD) Missile for lower altitude interception.
- It was first tested in 2007 and designed to knock down hostile missiles in the **endo-atmosphere at altitudes of 15-40 KM.**
- The endo-atmospheric missiles are the ones that operate within the earth's atmosphere that covers an altitude below 100 KM.

## 46. ISRO launches PSLV-C55 with two Singapore satellites

**Concept :**

- The Indian Space Research Organization's Polar Satellite Launch Vehicle (PSLV-C55) lifted off from the Satish Dhawan Space Centre in Sriharikota on Saturday, carrying two **Singapore spacecraft, TeLEOS-2 as primary and Lumelite-4 as co-passenger**.

**About the Mission**

- The mission was a dedicated commercial PSLV flight of NewSpace India Limited (NSIL) for a Singapore-based multinational satellite customer.
- The PSLV-C55 was carrying two Singapore satellites: **TeLEOS-2, the primary satellite, and Lumelite-4, the secondary satellite.**
- **TeLEOS-2,** which has a **Synthetic Aperture Radar payload**, was developed in collaboration between DSTA and ST Engineering to **fulfil the satellite imagery needs of multiple Singapore agencies.**
- **Lumelite-4** is a **technology demonstration nano-satellite** built by the Agency for Science, Technology, and Research's Institute for Infocomm Research (I2R) and the National University of Singapore's Satellite Technology and Research Centre (STAR).
- Its goal is to improve **Singapore's e-navigation maritime safety while also benefiting the worldwide shipping community.**
- The mission is **PSLV's 57th flight** and the **16th using the PSLV Core Alone configuration (PSLV-CA).**

**PSLV Orbital Experimental Module (POEM) :**

- The mission also **involves in-orbit scientific experiments using the spent PS4 stage as an orbital platform, which is the third time that PS4 will be used after satellite separations as a platform for experiments**.

- Non-separable payloads will be mounted on MSA (multi-satellite adapter), and the power will be provided to payloads and avionic packages based on their requirements.

## 47. Microbes at the top of the world

**Context:**

- An article, **Genetic analysis of the frozen microbiome at 7,900 metres above sea level on the South Col of Sagarmatha (Mount Everest),** by Dr. N.B. Dragone and others in journal Arctic, Antarctic, and Alpine Research examines the human microbiota on the inhospitable slopes of Mount Everest.

**Details of the study:**

- They were able to collect **microbial communities** in sediment samples left by human climbers on the **South Col of Mount Everest**, 7,900 metres above sea level (msl).
  - The **South Col** is the **ridge** which **separates Mt. Everest from Lhotse** — the fourth highest mountain on earth.
  - The **two peaks** are only three kilometres apart. At **7,900 msl,** the **South Col** is rather inhospitable — a heat wave in July 2022 led to a record high temperature of minus 1.4 degree Celsius.
  - A few species of moss and a jumping spider that feeds on frozen insects carried by the wind are found there.
- Using sophisticated methods such as **16S** and **18S rRNA sequencing,** the **microbe hunters were able to identify the bacteria and other microorganisms found on the South Col.**
  - **16s rRNA** is a component of the **30S subunit in prokaryotic ribosomes** while **18s rRNA** is a component of the **40S subunit in eukaryotic ribosomes.**
  - **16S ribosomal RNA (rRNA) sequencing** is an **amplicon sequencing technique** used to **identify and compare species of bacteria present within a given sample.**
  - **16S rRNA gene sequencing** is used to **study phylogeny and taxonomy of samples from complex microbiomes** or environments that are difficult or impossible to study.
- Microbes like *modestobacteraltitudinis* and the **fungus,** *naganishia*, which are known to be **UV-resistant survivors** are found there.

**Utilization of microbes:**

1. **Enzymes, chemicals, and other bioactive molecules**
   - Citric acid fungus Aspergillus niger
   - Acetobacter aceti (an acetic acid bacteria)
   - Clostridium butylicum (a butyric acid-producing bacterium)
   - Lactobacillus acidophilus (a bacterium).
   - For the commercial manufacturing of ethanol, yeast (Saccharomyces cerevisiae) is utilised.
2. **Milk to Curd**
   - **Lactobacillus** and other microorganisms known as lactic acid bacteria (LAB) thrive in milk and convert it to curd.
3. **Fermentation**
   - **Yeast** converts sugar into alcohol. Fermentation is the process of converting sugar into alcohol. In 1857, Louis Pasteur discovered fermentation.
   - **baker's yeast** is used to ferment the dough required to make bread (Saccharomyces cerevisiae).
4. **Fermented Drinks**
   - **Saccharomyces cerevisiae,** often known as **brewer's yeast**, is used for fermenting malted cereals and fruit juices to make ethanol for this purpose.
5. **Sewage treatment microbes**
   - The **microorganisms** devour the majority of the organic materials in the wastewater as they grow. This greatly reduces the **effluent's BOD (biochemical oxygen demand).**
6. **Microbes in biogas generation**
   - Biogas is a gas combination (predominantly methane) created by microbial activity that can be used as fuel.
   - **Methanogens** are bacteria that produce **Methanobacterium** is one such frequent bacterium.
7. **Biocontrol agents based on microbes**
   - **Bacillus thuringiensis** is an example of a **microbial biocontrol agent** that can be introduced to **control butterfly caterpillars** (often written as Bt).
   - The **fungus Trichoderma** is being developed as a biological control for the treatment of plant disease.
8. **Microbes as biofertilisers**
   - **Azospirillum, mycorrhiza** and **Azotobacter** can improve the **soil's nitrogen content by fixing atmospheric nitrogen** while growing freely in the soil.
   - Many **cyanobacteria,** including **Anabaena, Nostoc, Oscillatona, etc.,** are **autotrophic microbes** that can **fix atmospheric nitrogen.** They are found in both aquatic and terrestrial habitats.
   - **Cyanobacteria** are a significant biofertilizer in **paddy fields**.
9. **Preservatives**

**About Mount Everest:**

- Named **Mount Sagarmatha** in Nepal region.
- Nepal's eminent historian, late **Baburam Acharya**, gave it the Nepali name, **sagarmatha,** in the **1960s**.
- **Kangchenjunga peak:**
  - In **1847, Andrew Waugh, British Surveyor General of India**, found a peak in the **eastern end of the Himalayas** which was **higher than the Kangchenjunga** — considered as the **highest peak in the world at that time.**
    - His predecessor, **Sir George Everest,** was interested in high-altitude hills and had deputed Waugh to take charge. In true colonial spirit, **Waugh called it the Mount Everest.**
- The **Indian mathematician and surveyor, RadhanathSikdar,** was an able mathematician.
- He was the **first person to show that Mount Everest (then known as peak XV) was the world's highest peak.**
- **George Everest** had appointed **Sikdar** to the post of 'Computer' in the Survey of India in 1831.
- In **1852, Sikdar**, with the help of a special device, **recorded the height of 'Peak 15' at 8,839 metres.** However, it was officially announced in **March 1856.**

## 48. What is LockBit ransomware and why is it targeting macOS?

**Context:**

- Cybercriminals have developed **new ransomware encryptors designed to target macOS devices,** making this the **first major ransomware operation** to specifically target Apple computers.

**Details:**

- The new encryptors target both older Macs and newer ones running on Apple Silicon.
- Earlier in January, the LockBit gang was reportedly behind a cyber-attack on U.K. postal services.

**About LockBit ransomware:**

- First reported in September 2019 and also known as **"abcd" virus**. due to the file extension used when encrypting victim's files.
- The virus is categorised as a **"crypto virus"** due to its requests for payment in cryptocurrency to decrypt the files on the victim's device.
- The **LockBit ransomware** is designed to infiltrate victims' systems and encrypt important files.
- It targets the enterprises and organisations in the **U.S., China, India, Ukraine, and Indonesia.** Attacks have also been recorded throughout **Europe,** including in France, Germany, and the U.K.

**How do it works?**

- It works as a **self-spreading malware,** not requiring additional instructions **once it has successfully infiltrated a single device** with access to an organisational intranet.
- It also known to **hide executable encryption files by disguising them in the .PNG format**, thereby avoiding detection by system defences.
- It **disables security programs** and places an **encryption lock on all system files**, which can only be unlocked via a **custom key created by the LockBit gang.**

**About LockBit ransomware gang:**

- The group behind this is known as the **LockBit gang.**
- It is considered the **most prolific ransomware group ever.**
- It operates on the **ransomware-as-a-service (Raas) model** and comes from a line of extortion cyberattacks.

**How to protect systems against the LockBit ransomware?**

- The use of strong passwords, with strong variations of special characters which are not easy to guess along with multi-factor authentication should be implemented.
- This ensures the use of brute force will not be enough to compromise systems.
- Organisations can also undertake training exercises to educate employees on the use of phishing attacks and their identification.
- Old and unused user accounts should be deactivated and closed as they can become weak links in the security apparatus.

## 49. Malaria and Notifiable diseases in India

**Concept** :

- Malaria is all set to become a notifiable disease across India despite there being a decline in the number of cases.

**Details**

- At present, **malaria is a notifiable disease in 33 States and UTs in India.**

- The latest move is in line with **India's vision to be malaria-free by 2027** and to **eliminate the disease by 2030.**
- **India was the only high-burden, high-impact country** in the **Southeast Asian region** to **experience a decline** in malaria cases in 2020 as compared to 2019.
- India experienced an 85.1% decrease in malaria cases and an 83.36% decrease in deaths during 2015-2022.

## Notifiable diseases in India

- Notifiable diseases are **those diseases that are required by law to be reported to government authorities.**
- This is in line with the World Health Organization's International Health Regulations, 1969 that mandate disease reporting to the organization to help its global surveillance and advisory role.
- The collation of information helps the government authorities to monitor the disease and provides early warning of possible outbreaks.
- **Declaring diseases as legally notifiable by doctors and health professionals facilitates timely interventions to control the spread of highly infectious diseases.**
- The **responsibility of notifying such diseases and the implementation lies with the State government.**
- The government has declared several diseases as notifiable diseases including diseases like **cholera, encephalitis, leprosy, meningitis, plague, tuberculosis, AIDS, hepatitis, measles, yellow fever, dengue, etc.**

## About Malaria

- Malaria is a serious **mosquito-borne infectious disease caused by various species of parasitic protozoan** microorganisms called
- The malarial parasite was discovered by Dr Alphonse Laveran, a military doctor, in 1880.
- Malaria is **transmitted by an infected female Anopheles mosquito**.
- The plasmodium parasites multiply and develop **inside the liver cells and red blood cells of human beings.**
- **Symptoms:** Fever, chills, and headaches are considered mild symptoms, while fatigue, convulsions, and breathing difficulties are among the severe symptoms.
- Effective Vector Control is a vital component for the elimination of malaria. Insecticide-treated nets and indoor residual spraying (IRS) are also effective to reduce the transmission of the disease.
- **April 25 of every year has been commemorated as World Malaria Day since 2007.**

## 50. UAE's Hope space probe offers never before view of Mars moon

**Context**:

- A new map of Mars shows the Red Planet in stunning detail, revealing a wealth of fascinating geological features as seen from orbit.
- The high-resolution map could help scientists answer a number of pressing questions about Marsincluding how it came to be a dry, arid, and barren landscape despite once being abundant with liquid water.
- The Martian map was created by a team of scientists led by New York University Abu Dhabi (NYUAD) and the United Arab Emirates (UAE) Center for Space Science (opens in new tab).The researchers used data collected from orbit around Mars by the Emirates Mars Mission (EMM), also known as Hope or Al-Amal.

## Details:
## HOPE

- Unmanned craft, called Amal, Arabic for Hope, had reached the end of its nearly seven-month, 300-million-mile journey and had begun circling the red planet.
- It is a Mars orbiter spacecraft of the United Arab Emirates which is Arab world's first inter-planetary mission.
- The mission is officially named the Emirates Mars Mission (EMM) and the orbiter has been named Hope or 'Al Amal'.
- The mission has a life of one Martian year (equivalent to 2 earth year).

## The Probe carries three scientific instruments:

- **Emirates exploration Imager (EXI):** A high-resolution camera.
- **Emirates Mars Ultraviolet Spectrometer (EMUS):** A far-UV imaging spectrograph.
- **Emirates Mars InfraRed Spectrometer (EMIRS):** It will examine temperature profiles, ice, water vapor and dust in the atmosphere of Mars.

## Aim of mission

1. Climate dynamics and global weather map of Mars by studying the lower atmosphere of Mars
2. Weather of Mars affects the escape of hydrogen and oxygen, by correlating conditions in the lower and upper atmosphere
3. The presence and variability of hydrogen and oxygen in the upper atmosphere, and why Mars is losing these gases to space.

## Significance:
'Hope' mission is not only important for UAE, but also for the whole of Arab world, as it is the **Arab world's first interplanetary mission.**

- **Other Missions to Mars:**
  - **China**'s Chang'e Project
  - **USA's Perseverance**
  - **India Mangalyaan**

## 51. Unravelling DNA's structure

**Context:** Unravelling DNA's structure- A **landmark achievement** whose authors were **not fairly credited**. History has acknowledged how **Rosalind Franklin** was sidelined. Much has changed since 1953. However, **women are still massively underrepresented in the higher echelons of science.**

**DNA:**

- **Nucleus of a living cell** is **responsible for this transmission of inherent characters**, also called **heredity**.
- The **particles in nucleus of the cell**, responsible for heredity, are called **chromosomes** which are **made up of proteins and** another type of biomolecules called nucleic acids.
- **Nucleic acids** are **responsible for the transfer of characters from parents to off springs**. There are two types of nucleic acids — **DNA and RNA**.
- A nucleic acid **containing deoxyribose** is called **deoxyribonucleic acid** (DNA) while that which **contains ribose** is called ribonucleic acid (RNA).
- Both DNA and RNA contain **Adenine, Guanine and Cytosine**. The fourth base is **Thymine in DNA and Uracil in RNA**.
- The **structure of DNA is a double strand [helix]** whereas **RNA is a single strand molecule.**
- Hydrogen bonds bind the nitrogenous bases of the two separate polynucleotide strands to make double-stranded DNA.
- The DNA backbone is resistant to cleavage, and both strands of the **double-stranded structure store the same biological information**. Biological information is replicated as the two strands are separated.
- Within cells, DNA is **organized into long structures called chromosomes**. During cell division these **chromosomes are duplicated in the process of DNA replication**, providing each cell its own complete set of chromosomes.
- **Eukaryotic organisms** (animals, plants, fungi, and protists) **store most of their DNA inside the cell nucleus** and **some of their DNA in organelles, such as mitochondria** or chloroplasts.
- In contrast, **prokaryotes** (bacteria and archaea) store their DNA **only in the cytoplasm**.
- DNA is the **chemical basis of heredity** and **have the coded message for proteins to be synthesized** in the cell.
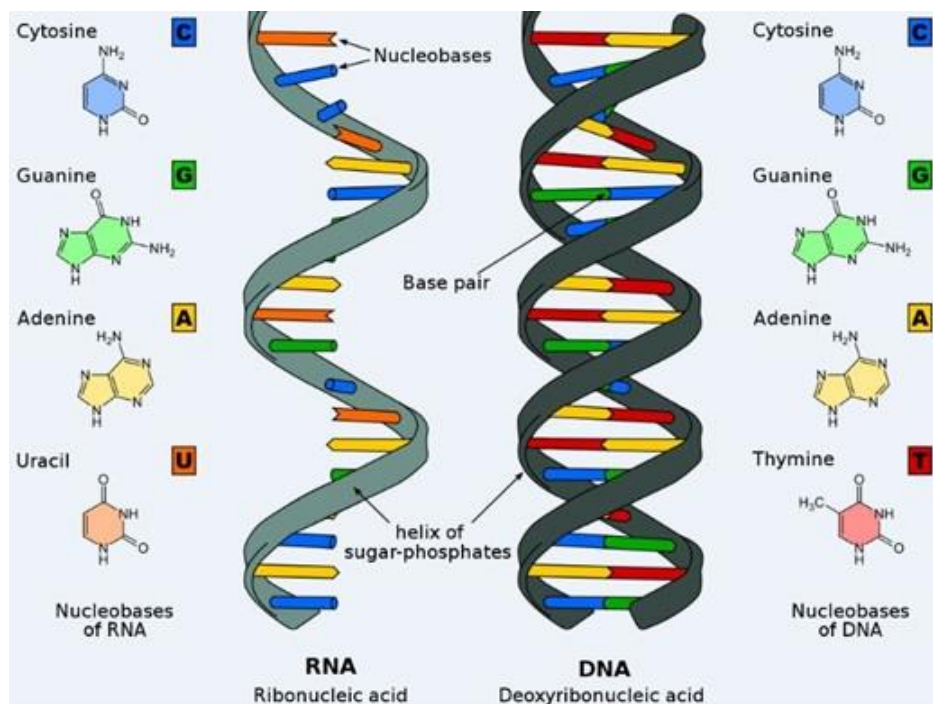


**DNA Fingerprinting:**

- DNA fingerprinting is a technique that is **used to identify individuals by analyzing their DNA**. It is also called DNA profiling or genetic fingerprinting.
- DNA fingerprinting is based on the fact that **every person has a unique DNA sequence**, **except for identical twins**, who have the same DNA sequence.
- The process of DNA fingerprinting involves **extracting DNA from a sample**, such as blood or saliva, and then **analyzing it to identify the unique DNA sequence**.

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- This is done by using techniques such as **polymerase chain reaction** (PCR), gel electrophoresis, and Southern blotting.
- DNA fingerprinting has many applications, including f**orensic investigations, paternity testing, and genetic research.**

**DNA Sequencing:**

- DNA sequencing is a **process of determining the nucleotide sequence** of a DNA molecule, which **involves reading the DNA molecule's order** of nucleotide bases, namely **adenine (A), cytosine (C), guanine (G), and thymine (T).**
- This process has **revolutionized the study of genetics** and has numerous applications in various fields, including medical research, forensic science, evolutionary biology, and agriculture.

Women in Science https://optimizeias.com/women-in-science/

## 52. The third-gen web is about public good

**Concept:**

- A 2021 report by the U.S.-India Strategic Partnership Forum states that the third-gen web will be crucial for India to realise its $1.1 trillion digital asset opportunity by 2032.

**Web 3**

- Web3 is **decentralised, privacy-oriented, blockchain-driven and crypto-asset friendly**.
- **Decentralised data storage systems**: Web3 seeks to radically transform the manner in which data is generated, monetised, shared and circulated. Further, it advocates decentralised data storage systems with the objective of unshackling the oligopolistic grip of technology behemoths over data.
- **Overcome the data storage barriers**: Web3 has file-sharing systems such as the Inter-Planetary File System which are cryptographically protected, more secure and capable of functioning off Internet and off blockchains. In this manner, Web3 seeks to overcome the data storage barriers of blockchains.

**Web 3.0**

- Web 3.0 upholds the property of the '**semantic web,' which is powered by Artificial Intelligence (AI).**
- **Authentic and creative information**: The real point about the semantic web is its ability to recombine information available on different websites to generate new content and knowledge resources that are more authentic and creative.
- **Better search engines**: Followers of Web 3.0 claim that their version is endowed with robust capability on the data analytics front. This way, it is argued that Web 3.0 will create far better search engines.

**How India can benefit ?**

- **Helping Craftsmen**: Web 3 platforms would enable handcraft enterprises to secure their innovations. Web 3-based instruction tools enable the rapid dissemination of grassroots innovations from master artisans to fellow members, which would improve the economic fortunes of craftsmen and artisan communities in north-east, western and peninsular India.
- **Exploiting community Data**: In recent times there has been the rapid rise of community data. The Atal Bhujal Yojana is an important source of data on groundwater utilisation practices. However, this data is untapped, which can be exploited by Web 3.0.
- **Benefiting Rural community**: One constraint today is the inability of data analytics capabilities to catch up with the pace of data generation in rural areas. By providing incentives for decentralised analytics and tokenising them (as envisaged in Web 3), it is possible to draw upon the talent pool for the benefit of rural communities.

## 53. Google, Meta, Apple on the radar in EU's online content rules

**Why in News?**
The European Union (EU) has confirmed the names of 19 platforms that will be subject to its landmark online content rules.
**News In Brief:**

- The rules, notified under the Digital Services Act, aim at overhauling the EU's social media and e-commerce rules, and at tightly regulate the way big technology platforms moderate user content. Five subsidiaries of Google's parent Alphabet, two Meta units, two Microsoft businesses, Apple's AppStore, Twitter, and Alibaba's AliExpress are among the entities that the EU has identified.

**Key features of the Digital Services Act (DSA)**
**Faster removals and provisions to challenge:** Social media companies will have to add "new procedures for faster removal" of content deemed illegal or harmful. They will also have to explain to users how their content takedown policy works. The DSA allows users to challenge takedown decisions made by platforms, and to seek out-of-court settlements.
**Bigger platforms have greater responsibility:** The legislation does not subscribe to a one-size fits all approach, and places increased accountability on the Big Tech companies. Under the DSA, 'Very Large Online Platforms' (VLOPs) and 'Very Large Online Search Engines' (VLOSEs) — that is, platforms having more than 45 million users in the EU, will have more stringent requirements.

**Direct supervision by the European Commission:** These requirements and their enforcement will be centrally supervised by the European Commission itself — an important way to ensure that companies do not sidestep the legislation at the member-state level.

**More transparency on how algorithms work:** VLOPs and VLOSEs will face transparency measures and scrutiny of how their algorithms work, and will be required to conduct systemic risk analysis and reduction to drive accountability about the society impacts of their products. VLOPs must allow regulators to access their data to assess compliance and allow researchers to access their data to identify systemic risks of illegal or harmful content.

**Clearer identifiers for ads and who's paying for them:** Online platforms must ensure that users can easily identify advertisements and understand who presents or pays for the advertisement. They must not display personalised advertising directed towards minors or based on sensitive personal data.

**India's online laws similar to EU's DSA**

- In February 2021, India had notified extensive changes to its social media regulations in the form of the Information Technology Rules, 2021 (IT Rules) which placed significant due-diligence requirements on large social media platforms such as Meta and Twitter.
- These included appointing key personnel to handle law enforcement requests and user grievances, enabling identification of the first originator of the information on its platform under certain conditions, and deploying technology-based measures on a best-effort basis to identify certain types of content.
- Social media companies have objected to some of the provisions in the IT Rules, and WhatsApp has filed a case against a requirement that requires it to trace the first originator of a message. One of the reasons that the platform may be required to trace the originator is that a user may share child sexual abuse material on its platform.
- However, WhatsApp has alleged that the requirement will dilute the encryption security on its platform and could compromise personal messages of millions of Indians.

Earlier in 2022, with a view to making the Internet "open, safe and trusted, and accountable", the Ministry of Electronics and IT notified amendments to IT intermediary Rules, 2021 aimed at protecting the rights of Digital Nagriks.

**Key changes effected in the IT Rules 2021 are as under**:

1. Currently, intermediaries are only required to inform users about not uploading certain categories of harmful/unlawful content. These amendments impose a legal obligation on intermediaries to take reasonable efforts to prevent users from uploading such content. The new provision will ensure that the intermediary's obligation is not a mere formality. The amendment requires intermediaries to respect the rights guaranteed to users under the of the Indian Constitution, therefore, including a reasonable expectation of due diligence, privacy and transparency.

2. For effective communication of the rules and regulations of the intermediary, it is important that the communication is done in regional Indian languages as well.

3. The grounds in rule 3(1)(b)(ii) have been rationalized by removing the words 'defamatory' and 'libellous'. Whether any content is defamatory or libellous will be determined through judicial review.

4. Some of the content categories in rule 3(1)(b) have been rephrased to deal particularly with misinformation, and content that could incite violence between different religious/caste groups.

5. The amendment requires intermediaries to respect the rights guaranteed to users under the Constitution, including a reasonable expectation of due diligence, privacy and transparency. The rules also have made it explicit for the intermediary to respect the rights accorded to the citizens of India under the **Articles 14, 19 and 21** of the Indian Constitution

6. Grievance Appellate Committee(s) will be established to allow users to appeal against the inaction of, or decisions taken by intermediaries on user complaints. They would have the authority to review and revoke content moderation decisions taken by large tech platforms. However, users will always have the right to approach courts for any remedy.

## 54. Dedicated Command Cyber Operations for the Indian Army

**Concept :**

- The Indian Army will now raise dedicated specialized agencies in each of its six operational or regional commands across the country to handle the cyberspace domain.

**Army Commanders Conference**

- Between April 17 and April 23, the **Army Commanders Conference** was held.
- The conference saw deliberations over wide-ranging Strategic, Training, Human Resource Development, and Administrative aspects and took key decisions in shaping the Army for the future.
- A number of welfare measures and initiatives were decided to be implemented for troops as well as veterans during the conference.
- One of these measures is the Command Cyber Operations and Support Wings.

**About Command Cyber Operations and Support Wings (CCOSW):**

- The Indian Army is rapidly migrating towards internet centricity, which entails an increased reliance on modern communication systems at all levels.
- The **CCOSWs will assist the Indian Army's formations in taking up cyberspace security** challenges posed by the growing warfare capabilities of adversaries.

**Need & Significance of the CCOSW:**

- This is an urgent necessity in the backdrop of China developing a wide array of cyberweapons to degrade or destroy an adversary's military assets and strategic networks even before the actual conventional war kicks off.
- China also regularly engages in malicious cyber activities as well as exploits cyberspace for its "**grey zone warfare**".
- **Grey zone warfare basically revolves around exploitation of the operational space between peace and war to change the status quo or coerce an adversary.**
- The Army believes the CCOSWs will help to safeguard its networks and increase the preparedness levels in this fifth dimension of warfare after land, sea, air and space.
- This step will lead to an overall strengthening of the cyber-security posture of the force for both conventional operations as well as grey zone warfare.

**Comparing India's Cyberwarfare Capabilities with Other Countries:**

- India has so far lagged behind in developing cyberwarfare capabilities.
- It was only in 2019 that the Union government approved the **creation of a small tri-service Defence Cyber Agency (DCA) at the apex level.**
- **China, in contrast, has a major strategic support force** to oversee the People's Liberation Army's space, cyber and electronic warfare operations.
- The **US, too, has a huge Cyber Command**, led by a four-star general, to launch a "full spectrum" war if required as well as protect over 15,000 American military networks from attacks round-the-clock.

## 55. INS Tarkash

**Concept :**

- **INS Tarkash** from the Indian Navy recently reached Port Sudan to help in the evacuation of stranded Indians as **part of "Operation Kaveri"**.
- **INS Tarkash is the third shi**p to join the evacuation **after INS Sumedha and INS Teg.**

**About INS Tarkash:**

- It is a state-of-the-art stealth frigate of the Indian Navy equipped with a versatile range of weapons.
- Tarkash belongs to the Talwar class of guided missile frigates. These are modified Krivak III class frigates built by Russia.
- It was built by the Yantar shipyard in Kaliningrad, Russia.
- It was commissioned into Indian Navy service on 9 November 2012 at Kaliningrad and joined the Western Naval Command on 27 December 2012.
- It is also **equipped with BrahMos missiles** instead of the Klub-N missiles, which makes it different from the earlier flight of Talwar-class ships.

**INS Sumedha**

- INS Sumedha is the third ship of the Saryu-class Naval Offshore Patrol Vessels (NOPV) of the Indian Navy.
- INS Sumedha was designed and constructed indigenously by Goa Shipyard Limited.
- It is fitted with a state-of-the-art weapon and sensor package.
- This ship is **designed to undertake support operations**, **coastal and offshore patrolling, ocean surveillance, search and rescue (SAR) operations, and humanitarian assistance and disaster relief (HADR).**

**INS Teg**

- INS Teg is the fourth Talwar-class frigate constructed for the Indian Navy.
- Just like the other Talwar-class frigates, INS Teg was built by the Yantar shipyard in Kaliningrad, Russia.
- The ship is named after "Teg", which is a short single-edged curved sword, traditionally used by Sikhs.
- INS Teg also uses **BrahMos missiles.**

**Operation Kaveri**

- It is a rescue operation being carried out by the Indian Government **to bring back Indian citizens stranded in Sudan.**
- According to the official data, the number of Indians in Sudan is around 4,000.
- Sudan has been witnessing deadly fighting between the country's army and a paramilitary group, the paramilitary Rapid Support Forces (RSF), that has reportedly left several hundred's dead.
- It was triggered by **disagreement over an internationally backed plan to form a new civilian government four years after the fall of autocrat Omar al-Bashir and two years after the military coup. Both sides accuse the other of thwarting the transition.**

## 56. PM launches 91 new FM transmitter in 18 states

**Concept :**

- The **PM of India inaugurated 91 FM transmitters spread across 18 states and two UTs** and asserted that the government was working towards giving people in every nook and corner of the country affordable access to technology.
- With this, **All India Radio was well on its way to expand its FM footprint nationally**.
- These FM transmitters will play a key role in a range of services be it timely dissemination of information, weather forecast for agriculture or connecting the women SHGs with new markets.

**Frequency Modulation (FM)**

- It is the **encoding of information in a carrier wave by varying the instantaneous frequency of the wave.**
- The technology is used in **telecommunications, radio broadcasting, signal processing, and computing.**
- In analog FM (radio broadcasting), the instantaneous frequency deviation – the **difference between the frequency of the carrier and its center frequency** – has a functional relation to the modulating signal amplitude.
- Digital data can be encoded and transmitted with a type of FM known as **frequency-shift keying (FSK),** in which the instantaneous frequency of the carrier is shifted among a set of frequencies.

**FM Transmitter**

- It is a low-**power FM radio transmitter that broadcasts a signal from a portable audio device (such as an MP3 player) to a standard FM radio**.
- Most of these transmitters plug into the device's headphone jack and then broadcast the signal over an FM broadcast band frequency, so that it can be picked up by any nearby radio.
- This allows portable audio devices to make use of the louder or better sound quality of a home audio system or car stereo without requiring a wired connection.
- Being low-powered, most transmitters typically have a short range of 100-300 feet (30–91 metres), depending on the quality of the receiver, obstructions and elevation.

**57. Apes Like to Spin Like Humans**

**Why in News?**

Just like humans, great ape species also seem to regularly enjoy stimulating their senses through spinning, possibly even in pursuit of altered mental states. Many animals, especially humans' closest relatives like chimpanzees, display behavioural attributes similar to humans. Studying these behaviours provides scientists with not just a greater understanding of the animals but also of evolution and human beings themselves.

**News in Brief**

1. Videos of gorillas, chimpanzees and other animals engaging in human-like spinning around in circles, somersaulting, etc. went viral.
2. They do so for stimulating their senses just like humans.
3. 400 videos showing great apes and other primates engaged inspinningbehaviors were amassed by cognitive scientists. Mostly captive apes, but a few were wild mountain gorillas.
4. This led to a research by primatologist and evolutionary psychologist to find if other primates also do so for the same reason, that is for a fun and exhilarating experience felt by children evidenced by the enduring popularity of playground merry-go-rounds.
5. The new research suggests that humans are not alone in their pursuit of spin-induced buzzes.

**Research Findings**

1. Other great ape species also seem to regularly enjoy stimulating their senses through spinning, possibly even in pursuit of altered mental states.
2. Spinning, whirling, backflipping, somersaulting are not distinctly human activity as thought of so far.
3. Spinning speed was rivaling professionally trained human dancers and aerialists – average rotation velocity of 1.43 revolutions per second.
4. The longest spin session lasted 28 revolutions, and the fastest was a brain-scrambling 4 revolutions per second by a bonobo.
5. The longer an ape spun, the more likely it was to show signs of dizziness, such as letting go of the rope and immediately sitting or lying down.
6. Apes tended to repeat the process of spinning and stopping, engaging in an average of three bouts of spinning per session.
7. "Play faces" made by the animals while spinning – Imply that they were having fun rather than only seeking a way to relieve themselves of boredom in captivity.

**Animals Getting High**

1. These animals also engage in other activities that can scramble the senses, including consuming fermented fruits containing alcohol and ingesting naturally occurring psychedelic substances.
2. It is debated if this behavior is done on purpose or by accident.

**Future Prospects of Research**

1. Such studies may provide data needed to explore behaviors that may be evolutionary precursors to the human desire to experience altered mental states.

2. Collecting evidence of other species, including grizzly bears and pandas, that appear to enjoy activities that may make them dizzy may open a larger study.
3. Researching such behavior may reveal that we are not the only animals who engage in behaviors that intentionally produce altered states of consciousness.
4. Systematic research will help us learn more about the taxonomy of getting high and change the feeling that we are all that unique.

## 58. In malaria vaccine research, bright hopes and formidable challenges

### Malaria Facts and Features

- Life-threatening disease spread to humans by some types of **mosquitoes**
- Mostly found in **tropical countries**
- **Higher risk of severe infection** – Infants, children under 5 years, pregnant women, travellers and people with HIV or AIDS
- Preventable by avoiding mosquito bites and curable with medicines
- Malaria infection during **pregnancy** can also cause **premature delivery** or delivery of a baby with **low birth weight**.
- Kills over 4,00,000 people each year

### Vector and Causes

- Spreads through the bites of some infected **female Anopheles mosquitoes**
- Blood transfusion and contaminated needles transmit malaria

### Disease causing Microbes

- 5 Plasmodium parasite species cause malaria in humans.
- **falciparum and P.vivax**pose the greatest threat.
- falciparum – deadliest malarial parasite and the most prevalent on the African continent. **95% of all cases of P.falciparum occur in the African region** and are associated with severe disease and disease-associated mortality.
- **vivax – geographically most widespread** in tropical and sub-tropical regions. Dominant in most countries outside of sub-Saharan Africa
- Other 3 Plasmodium species infecting humans – **malariae, P. ovale and P. knowlesi**

### Symptoms

- Most common early symptoms – **fever, headache and chills**
- Symptoms usually start within 10–15 days of getting bitten by an infected mosquito
- Symptoms may be **mild to severe**
- **Severe symptoms** include – Abnormal bleeding, difficulty in breathing, jaundice, impaired consciousness, multiple convulsions
- Early treatment for mild malaria stops infection from becoming severe
- The vaccine has been shown to significantly reduce malaria, and deadly severe malaria, among young children.

### Two New Breakthrough in Vaccination
1. Since October 2021, WHO recommends broad use of the RTS, S /AS01 malaria vaccine among children living in regions with moderate to high **falciparum**malaria transmission – high transmission African countries
2. **R21,** which like RTS, S works against the **liver stage of the parasite**

### About RTS, S Vaccine
1. A result of collaborative efforts of several organisations around the world including GlaxoSmithKline (GSK), Walter Reed Army Institute of Research, PATH Malaria Vaccine Initiative, Bill and Melinda Gates Foundation, and Wellcome Trust.
2. Taken more than 30 years and several hundred million dollars to develop
3. Relatively low efficacy of 30-40%
4. Already been administered to over a million children in pilot trials since 2019
5. Resulted in a **significant reduction in severe malaria and hospitalization** in malaria-endemic countries like **Ghana, Kenya, and Malawi**.
6. Hyderabad-based Bharat Biotech – granted a licence to manufacture this vaccine. Expected to be the only global manufacturer of the vaccine by 2029. GlaxoSmithKline (GSK) will provide the vaccine's key ingredient adjuvant.

### About R21 Vaccine
1. Developed by scientists at Oxford University.
2. Formulated with proprietary **adjuvant from Novavax called Matrix M**
3. This adjuvant has also been used in the **protein based Covid-19 vaccine** manufactured and marketed in India by SII under the brand name
4. Crucial large scale phase 3 trials of this vaccine have been conducted in several malaria endemic countries in Africa after successful phase 2 clinical studies.

5. Regulatory authorities in **Ghana and Nigeria** have already **approved** the vaccine in their countries. Submitted for WHO consideration.

## What is an Adjuvant

An adjuvant is an ingredient used in some vaccines that helps **create a stronger immune response** in people receiving the vaccine. In other words, adjuvants help vaccines work better.

## Initiatives to reduce malarial causes and deaths

1. **Roll Back Malaria** launched by **WHO** in 1998 – to reduce deaths from malaria by half by 2010
2. A major malaria eradication programme launched in 2015

These have resulted in **significant reduction in malaria causes and deaths**.

## Challenges Associated

1. **Malaria parasite** is extremely complex and elusive, with a **life cycle involving multiple stages –** very difficult to develop efficacious vaccines against malaria.
2. Of the more than 100 candidates that have entered clinical trials in the last three decades, none shown the **benchmark efficacy of 75% set by the WHO.**
3. **Covid-19** pandemic has disrupted malaria control, diagnosis, and treatment measures.

## Other Facts

1. **WHO's guiding theme 2023** – "Time to deliver zero malaria: invest, innovate, implement"
2. **World Malaria Day**— observed every year on **April 25**

## Serum Institute of India

Serum Institute of India (SII) is a Pune based **world's largest vaccine manufacturer** by number of doses produced and sold globally. SII has already established the capacity to produce 200 million doses annually, underlining its commitment to the fight against malaria and its eradication.

## Research in India

1. **Controlled human malaria infection (CHMI) studies** have the potential to fast-track initial assessments of vaccine efficacy and also facilitate the first clinical evaluation of vaccines involving fewer adult subjects.
2. Basic malaria research is being carried out in many academic institutions in India. But human challenge model or CHMI is not set up.
3. Scientists at the **International Centre for Genetic Engineering and Biotechnology (ICGEB),** New Delhi have successfully developed and produced two experimental **recombinant blood stage malaria vaccines** against **falciparum and P.vivax** and carried out phase1 first-in-man clinical trials in India.
4. CHMI studies with P.vivax vaccine for efficacy assessment has been completed in collaboration with scientists at Oxford University.

Current and future vaccines for lower-and middle-income countries will mostly be manufactured in India. So India has to invest, integrate, and be the leader in finding solutions to combat deadly infectious diseases in the world.

## About International Centre for Genetic Engineering and Biotechnology (ICGEB)

- The ICGEB is a unique intergovernmental organisation initially established as a special project of UNIDO.
- Autonomous since 1994, it runs over 45 state-of-the-art laboratories, in Trieste, Italy, New Delhi, India and Cape Town, South Africa.
- Forms an interactive network with almost 70 Member States, with operations aligned to those of the United Nations System.
- It plays a key role in Biotechnology, promoting Research excellence, Training, and Technology Transfer to industry, to contribute in concrete terms to sustainable global development.
- The ICGEB currently has 66 full Member States, a further 19 countries are still pending ratification of, or accession to, the Statutes of ICGEB.

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# LAQSHYA 2023

## TEST BASED MENTORSHIP FOR CSE PRELIMS 2023

**UNION PUBLIC SERVICE COMMISSION**
**MARKSHEET**

| Civil Services (PRELIMINARY) Examination , 2016 | |
|---|---|
| Roll Number | 0029983 |
| Name | SANTOSH PANDEY |
| Marks Obtained | |
| Paper I | 144.66 |
| Paper II | 107.50 |

**REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION,2016**

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**Santosh Sir**
**CRACKED ALL 6 PRELIMS**

- **NCERT LEVEL TEST – 11**
- **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**

## More than 70 questions in CSE PRELIMS 2022 Paper came from LAQSHYA 2022

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