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PRELIMS



POLITY & GOVERNANCE



Basic Structure Doctrine

In News: The Supreme Court has agreed to examine a PIL challenging changes made to the right to freedom of speech and expression by the first amendment to the Constitution in 1951, with the petitioner contending that the amendment damages the basic structure doctrine.

- The plea urged the court to declare Section 3 (1)(a) and 3 (2) of the First Amendment “beyond the amending power of Parliament” and void since the “same damage the basic or essential features of the Constitution and destroy its basic structure”.

About:

- **Section 3(1) of the 1951 Amending Act substituted original Clause (2) of Article 19** – dealing with reasonable restrictions on the freedom of speech and expression guaranteed under Article 19(1)(a) – with a new Clause (2), which contained “two objectionable insertions” allowing restrictions also “in the interest of public order” and “in relation to incitement to an offence” and omitted the expression “tends to overthrow the State.”
- The two insertions protect Sections 124A (sedition), 153A (promoting enmity), 295A (deliberate and malicious acts, intended to outrage religious feelings) and 505 (statements conducing to public mischief) of the Indian Penal Code “from the vice of unconstitutionality”.
- The two questionable expressions inserted unduly abridge the fundamental right under Article 19 and damages democracy and republicanism and supremacy of the Constitution.
- The amendment also neglects national security by dropping the expression ‘tends to overthrow the State’ by radicalism, terrorism and religious fundamentalism.

First Amendment:

- Passed in 1951 by the then Provisional Parliament headed by Jawaharlal Nehru.
- It amended articles 15, 19, 85, 87, 174, 176, 341, 342, 372 and 376.
- It inserted articles 31A and 31B and Ninth Schedule to protect the land reform and other laws present in it from the judicial review.
- It placed reasonable restrictions on fundamental rights and added three more grounds of restrictions on freedom of speech such as public order, friendly relations with foreign states and incitement to an offence.

National Commission for Protection of Child Rights (NCPCR)

Context: The child rights body has received complaint from an NGO which alleged that the All India Mission was involved in ‘illegally converting children in India’.

About NCPCR:

- National Commission for Protection of Child Rights (NCPCR was established in March 2007 under an **Act of Parliament (December 2005) under the Commission for Protection of Child Rights Act, 2005.**
- The commission’s mandate is to ensure that all laws, policies, programs and administrative systems conform to the vision of the rights of the child as enunciated in the Constitution of India as well as the United Nations Convention on the Rights of the Child.
- **A child is defined as a person falling in the age group of 0 to 18 years.**

	<ul style="list-style-type: none"> • The Commission envisages a rights-based perspective, which flows into national policies and programmes, including defined responses at the state, district and block levels, considering the specifics and strengths of each region. • For the purpose of this, it is intended to make deep penetration into the communities and families of and it is expected that the collective experience gained in the field will be considered by all the authorities at the higher level. <p>The Commission, while inquiring into any matter under Section 13(1)(j) of CPC Act, 2005 has all the powers of a civil court trying a suit under the Code of Civil Procedure, 1908 and, in particular, in respect of the following matters, namely:-</p> <ul style="list-style-type: none"> • summoning and enforcing the attendance of any person and examining him on oath; • discovery and production of any document; • receiving evidence on affidavits; • requisitioning any public record or copy thereof from any court or office; and • issuing commissions for the examination of witnesses or documents. <p>The Commission has also the power to forward any case to a Magistrate having jurisdiction to try the same and the Magistrate to whom any such case is forwarded shall proceed to hear the complaint against the accused as if the case has been forwarded to him under section 346 of the Code of Criminal Procedure, 1973 (2 of 1974).</p>
22nd Law Commission	<p>In news: The Centre constituted the Law Commission of India with Justice (retd) Rituraj Awasthi, former Chief Justice of Karnataka High Court, at its head.</p> <ul style="list-style-type: none"> • The Law Commission is a non-statutory body that is constituted by a notification of the Government of India in the Official Gazette. • It makes recommendations to the Government (in the form of Reports). • It was first constituted in 1955, and has so far submitted 277 reports. • The Commission would have a tenure of three years from the date of publication of the Order of Constitution. <p>Functions: The Commission shall, among other things,</p> <ul style="list-style-type: none"> • identify laws which are no longer needed or relevant and can be immediately repealed • examine the existing laws in the light of Directive Principles of State Policy and suggest ways of improvement and reform and suggest such legislations as might be necessary to implement the Directive Principles and to attain the objectives set out in the Preamble of the Constitution • revise the Central Acts of general importance to simplify them and remove anomalies, ambiguities and inequities. • The tenure of the 21st Law Commission, which was headed by former Supreme Court judge Justice B S Chauhan, came to an end on August 31 2018. • The 22nd Commission has been constituted two and a half years after it was approved by the Union Cabinet in 2020, just before the outbreak of the Covid-19 pandemic.
House Arrest	<p>In News: Supreme Court has allowed 'house arrest' for human rights activist Gautam Navlakha.</p> <p>What is House Arrest?</p> <ul style="list-style-type: none"> • House arrest—also known as home confinement or home detention—is the act of confining a person to specified premises that are not a regular jail. • These premises can be the person's own home or someone else's, subject to approval by the authorities.

	<ul style="list-style-type: none"> House arrest is seen as an alternative to confinement in jail either during trial or after sentencing, which can be used in the case of certain categories of prisoners with specific medical or other needs, or those who are not deemed dangerous. House arrest is allowed under specific conditions that are peculiar to each prisoner. They almost always include restrictions on travel and meeting people, and may include electronic surveillance of the prisoner by means of a wearable tracking device. <p>The Code of Criminal Procedure does not mention house arrest.</p> <ul style="list-style-type: none"> Section 5 of the National Security Act, 1980, empowers the state to detain an individual “in such place and under such conditions...as the appropriate Government may, by general or special order, specify”. The detained person may be “removed from one place of detention to another place of detention, whether within the same State or in another State, by order of the appropriate Government”.
‘Sealed Cover jurisprudence’	<p>In News: A Bench led by (now) Chief Justice of India D Y Chandrachud criticised the practice of “sealed cover” jurisprudence.</p> <ul style="list-style-type: none"> In its order issued in ‘Cdr Amit Kumar Sharma v Union of India’ on October 20, 2022, SC called it as setting a “dangerous precedent”, which makes “the process of adjudication vague and opaque”. <p>Sealed cover jurisprudence:</p> <ul style="list-style-type: none"> It is the controversial practice followed by the Supreme Court (and sometimes lower courts as well) of seeking and accepting information from government agencies in sealed envelopes that can only be perused by the judges. It is found in Rule 7 of Order XIII (“Copying”) of the Supreme Court Rules, 2013 (notified in May 2014) Applicability: When information is connected to an ongoing investigation, and when it involves personal or confidential information. <p>Effect:</p> <ul style="list-style-type: none"> The sealed cover procedure affects the functioning of the justice delivery system both at an individual case- to case level and at an institutional level. It denies the aggrieved party their legal right to effectively challenge an order since the adjudication of issues has proceeded based on unshared material provided in a sealed cover. It prevents parties from having a full overview of the charges against them It perpetuates a culture of opaqueness and secrecy by bestowing absolute power in the hands of the adjudicating authority. It also tilts the balance of power in a litigation in favour of a dominant party which has control over information. It also takes away the opportunity to analyse judicial decisions, and to appreciate the rationale behind them. The Supreme Court clarified that all information must be not disclosed in the public, example “sensitive information affecting the privacy of individuals such as the identity of a sexual harassment victim”. The Supreme Court itself has encouraged the practice of seeking public-interest related information in sealed envelopes such as in the Rafale aircraft case, the court accepted the government’s argument that the matter pertained to the Official Secrets Act.
Mother Tongue	<p>In News: The Ministry of Home Affairs (MHA) has completed the Mother Tongue Survey of India (MTSI) with field videography of the country’s 576 languages.</p>

**Survey of
India****What is the MTSI?**

- The Mother Tongue Survey of India is a project that “surveys the mother tongues, which are returned consistently across two and more Census decades”.
- It also documents the linguistic features of the selected languages.
- The NIC and the National Film Development Corporation (NFDC) will be documenting and preserving the linguistic data of the surveyed mother tongues in audio-video files.

How many “mother tongues” does India have, and what is spoken the most?

- As per an analysis of 2011 linguistic census data in 2018, more than 19,500 languages or dialects are spoken in India as mother tongues.
- The category “mother tongue” is a designation provided by the respondent, but it need not be identical with the actual linguistic medium.
- After linguistic scrutiny, edit and rationalisation, they were grouped into 121 mother tongues.
- According to the 2011 linguistic census, Hindi is the most widely spoken mother tongue, with 8 crore people or 43.6 per cent of the population declaring it as the mother tongue.
- The next highest is Bengali, mother tongue for 9.7 crore individuals, and accounting for 8 per cent of the population.



ECONOMY



Purchasing Manager's Index

- **In News:** India's manufacturing industry remained robust and expanded at a faster pace indicating a strong improvement in the health of the sector.
- The seasonally adjusted S&P Global India Manufacturing Purchasing Managers' Index (PMI) rose to 55.3 in October from 55.1 in September
- Predictions of better sales and marketing efforts were among the reasons cited for upbeat projections.

About:

- Business volumes rose and led to the hiring of extra workers
- Manufacturing employment rose
- Factory orders increased.
- Rise in input purchasing
- Capacities were again expanded to accommodate for improving sales.
- Consumer goods was the best-performing category.
- The overall rate of cost inflation was the second-weakest for two years.
- A modest increase in input lead times.

About PMI:

- PMI or a Purchasing Managers' Index (PMI) is an indicator of business activity — **both in the manufacturing and services sectors.**
- It is a survey-based measures that asks the respondents about changes in their perception of some key business variables from the month before.
- **It is calculated separately for the manufacturing and services sectors and then a composite index is constructed.**
- The index is compiled by **S&P Global** from responses to questionnaires sent to purchasing managers in a panel of around 400 manufacturers.
- **A figure above 50 denotes expansion in business activity. Anything below 50 denotes contraction.**
- **The PMI is usually released at the start of the month**, much before most of the official data on industrial output, manufacturing and GDP growth becomes available. It is, therefore, considered a good leading indicator of economic activity and of industrial output.

One nation, One ITR Form

Context: Recently, the Central Board of Direct Taxes (CBDT) has proposed a single **income tax return (ITR)** form for all taxpayers.

About ITR forms:

- There are seven kinds of ITR forms, which are used by different categories of taxpayers. They are as follows:
- **ITR Form 1, called 'Sahaj'**, is for small and medium taxpayers. Sahaj forms can be filed by individuals who have an income up to Rs 50 lakh, with earnings from salary, one house property/ other sources (interest etc).
- **ITR-2 is filed by people with income from residential property.**
- **ITR-3 is intended for people who have income as profits from business/ profession**

- **ITR-4 (Sugam)** is, like **ITR-1 (Sahaj)**, simple forms, and can be filed by **individuals, Hindu Undivided Families (HUFs) and firms with total income up to Rs 50 lakh** from business and profession.
- **ITR-5 and 6** are for **limited liability partnerships (LLPs) and businesses respectively.**
- **ITR-7** is filed by **trusts and non-profit organisations.**

Changes that has been proposed:

- All taxpayers, **barring trusts and non-profit organisations (ITR-7)**, will be able to use a common ITR form, which will include a separate head for disclosure of income from virtual digital assets.

Rationale behind bringing one Nation one OTR form:

- The proposed draft ITR takes a relook at the return filing system in tandem with international best practices.
- The draft form aims to make it easier to file returns, and to considerably reduce the time taken for the job by individuals and non-business-type taxpayers.
- It intends the smart design of schedules in a user-friendly manner with a better arrangement, logical flow, and increased scope of pre-filing.
- It will also facilitate the proper reconciliation of third-party data available with the Income-Tax department vis-à-vis the data to be reported in the ITR to reduce the compliance burden on the taxpayers.

About Central Board of Direct Taxes (CBDT):

Functions and Organization:

- The Central Board of Direct Taxes is a statutory authority functioning under the Central Board of Revenue Act, 1963.
- The officials of the Board in their ex-officio capacity also function as a Division of the Ministry dealing with matters relating to levy and collection of direct taxes.

Historical Background of C.B.D.T.:

- The Central Board of Revenue as the apex body of the Department, charged with the administration of taxes, came into existence as a result of the Central Board of Revenue Act, 1924.
- Initially the Board was in charge of both direct and indirect taxes. However, when the administration of taxes became too unwieldy for one Board to handle, the Board was split up into two, namely the Central Board of Direct Taxes and Central Board of Excise and Customs with effect from 1.1.1964.
- This bifurcation was brought about by constitution of two Boards u/s 3 of the Central Board of Revenue Act, 1963.

Black Sea Grain Initiative

In News: Russia has re-joined the Black Sea Grain deal.

- United States and Ukraine are accusing Russia of using food exports as a means to strengthen its position in the war.

Black Sea Grain deal:

- Aims to limit food price inflation emanating from supply chain disruptions because of Russian actions in the world's 'breadbasket' by ensuring an adequate supply of grains.
- The deal, brokered by the United Nations (UN) and Turkey, was signed in Istanbul in July 2022.
- Initially stipulated for a period of 120 days, with an option to extend or terminate, the deal was to provide for a safe maritime humanitarian corridor for Ukrainian exports

(particularly for food grains) from three of its key ports, namely, Chornomorsk, Odesa and Yuzhny/Pivdennyi.

Features:

- A Joint Coordination Centre (JCC), comprising senior representatives from Russia, Turkey, Ukraine and the UN for oversight and coordination.
- All commercial ships are required to register directly with the JCC to ensure appropriate monitoring, inspection and safe passage. Inbound and outbound ships (to the designated corridor) transit as per a schedule accorded by the JCC post-inspection. This is done so as to ensure there is no unauthorised cargo or personnel onboard. Following this, they are allowed to sail onwards to Ukrainian ports for loading through the designated corridor.
- All ships, once inside the Ukrainian territorial waters, are subject to the nation’s authority and responsibility.
- Should there be any requirement for removing explosives, a minesweeper from another country would be required to sweep the approaches to the Ukrainian ports, in other words, accompany the vessel with tugboats.
- Moreover, in order to avoid provocations and untoward incidents, it is mandated that monitoring be done remotely.
- No military ships or unmanned aerial vehicles can approach the corridor closer than a pre-decided distance agreed upon by the JCC. This too would require consultation with the parties and authorisation of the JCC.

Significance:

- Ukraine is among the largest exporters of wheat, maize, rapeseed, sunflower seeds and sunflower oil, globally.
- Its access to the deep-sea ports in the Black Sea enables it to directly approach Russia and Europe along with grain importers from the Middle East and North Africa.
- Russia’s action in the East European country has now disturbed this route, earlier used to ship 75% of its agricultural exports – precisely what the initiative sought to address.
- The initiative has been credited for having made a “huge difference” to the global cost of living crisis.
- The initiative alone cannot address global hunger; it can only avert the chances of the global food crisis spiralling further.
- As per the UN Office for Coordination of Humanitarian Affairs, approximately 9.8 million tonnes of grains have been shipped since the initiative was commenced.
- People hoarding the grain in the hope of selling it for a sizeable profit owing to the supply crunch were now obligated to sell.

Sovereign green bonds

Context: Recently the Central government released the Sovereign Green Bonds Framework. The revenue generated from the issuance of sovereign green bonds will be deployed in public sector projects that help in reducing the carbon intensity of the economy.

About Green Bonds:

- Green bonds are issued by companies, countries and multilateral organisations to exclusively fund projects that have positive environmental or climate benefits and provide investors with fixed income payments.
- The projects can include renewable energy, clean transportation and green buildings, among others.

Examples of Green Bonds:

- The World Bank is a major issuer of green bonds and issued \$14.4 billion of green bonds between 2008 and 2020.
- These funds have been used to support 111 projects around the world, largely in renewable energy and efficiency (33%), clean transportation (27%), and agriculture and land use (15%).
- By the end of 2020, 24 national governments had issued Sovereign Green, Social and Sustainability bonds totalling a cumulative \$111 billion, according to the London-based Climate Bonds Initiative.

About India's Sovereign Green Bonds Framework:

- First announced in the Union Budget 2022-23, the proceeds of these green bonds will be issued for mobilising resources for green infrastructure.

Aim –

- To mobilise Rs 16,000 crore through the issuance of green bonds in the current fiscal ending March 2023.
- Under the framework, the Finance Ministry will, every year, inform the RBI about spending on green projects for which the funds raised through these bonds will be used.

Implementing Agency:

- **The Ministry of Finance** has constituted a **Green Finance Working Committee (GFWC)** including members from relevant line ministries and chaired by the Chief Economic Advisor.
- The GFWC will meet at least twice a year to support the Ministry of Finance with selection and evaluation of projects and other work related to the Framework.

Eligible Projects:

- All eligible green expenditures will include public expenditure undertaken by the government in the form of investment, subsidies, grants-in-aid, or tax foregone (or a combination of all or some of these) or select operational expenditures.
- R&D expenditures in public sector projects that help in reducing the carbon intensity of the economy and enable country to meet its Sustainable Development Goals (SDGs) are also included in the framework.
- The eligible expenditures will be limited to government expenditures that occurred maximum 12 months prior to issuance of the green bonds.
- **Sectors not included –Nuclear power generation, landfill projects, alcohol/weapons/tobacco/gaming/palm oil industries and hydropower plants larger than 25 MW have been excluded from the framework.**

Currency Monitoring List of USA

Context: The U.S. Department of Treasury removed India along with Italy, Mexico, Thailand and Vietnam from its Currency Monitoring List of major trading partners.

About Currency Monitoring List:

- Putting a country under the Currency Monitoring List would mean that the **country is artificially lowering the value of its currency to gain an unfair advantage over others.**
- This is because the **lower value of the currency will lead to a reduction of the export costs from that country.**
- The US Department of Treasury releases a semi-annual report in which it tracks global economic developments and reviews foreign exchange rates.
- It also reviews the currency practices of the US' 20 biggest trading partners.
- There are three criteria based on which a country is put under the currency watch list.

- A country that meets two of the three criteria in the US' Trade Facilitation and Trade Enforcement Act of 2015 is put under the Currency Monitoring List.
- A significant bilateral trade surplus with the US — at least \$20 billion in 12 months.
- A material current account surplus equivalent to at least 2 per cent of gross domestic product (GDP) over a 12-month period.
- Persistent, one-sided intervention, when net purchases of foreign currency totalling at least 2 per cent of the country's GDP over a 12-month period are conducted repeatedly, in at least six out of 12 months.
- Once a country meets all three criteria, it is labelled as a 'currency manipulator' by the US Department of Treasury.
- Once on the Monitoring List, an economy will remain there for at least two consecutive reports to help ensure that any improvement in performance versus the criteria is durable and is not due to temporary factors.

The following countries are presently on the list:

- **China, Japan, Korea, Germany, Malaysia, Singapore and Taiwan.**

Reasons for removal of India from the list:

- India was removed from the Monitoring List as they now only met one of the three criteria for two consecutive reports.
- India has been on the list for about two years.

How does it impact India?

- When on the **US' Currency Monitoring List**, a country is considered a '**currency manipulator**'.
- A currency manipulator is a designation applied by US government authorities to countries that engage in unfair currency practices for a trade advantage.
- This removal from US' Currency Monitoring List means that the Reserve Bank of India (RBI) can now take robust measures to manage the exchange rates effectively, without being tagged as a currency manipulator.
- To manage exchange rates amid the rupee fall, the RBI recently took actions like buying dollars at the time of excess inflows and selling dollars at the time of outflows.

About Currency Manipulator:

- A currency manipulator is a designation applied by US government authorities to countries that engage in "**unfair currency practices**" for a trade advantage.

Global Shield Financing Facility

Context: Recently the **World Bank Group** has announced a **Global Shield Financing Facility** to help developing countries access more financing for recovery from natural disasters and climate shocks.

About Global Shield Financing Facility Initiative:

- The **Global Shield Against Climate Risks initiative** was launched at the 27th Conference of Parties (COP27) to the **United Nations Framework Convention on Climate Change in Sharm El-Sheikh, Egypt.**
- The Global Shield Financing Facility will channel grants to developing countries through World Bank projects or through projects prepared by other participating partners, including UN agencies and multilateral development banks.
- It will also work closely with key stakeholders, such as civil society organizations, risk pools, private sector and humanitarian partners.
- Pakistan, Bangladesh, Costa Rica, Fiji, Senegal, Philippines and Ghana will be the first to receive assistance under this initiative.

- The initial contributions for this initiative are provided Germany, Denmark, Ireland and Canada.

About V20 Countries:

- **The Vulnerable Twenty (V20) Group** was established with the inaugural meeting of the **V20 Ministers of Finance of the Climate Vulnerable Forum chaired by H.E. Cesar V. Purisima, Secretary of Finance of the Philippines**, on 08 October 2015 at Lima, Peru in conjunction with the 2015 Annual Meetings of the **World Bank Group and International Monetary Fund**.
- The call to create the V20 originated from the Climate Vulnerable Forum's Costa Rica Action Plan (2013-2015) in a major effort to strengthen economic and financial responses to climate change.
- It foresaw a high-level policy dialogue pertaining to action on climate change and the promotion of climate resilient and low emission development with full competence for addressing economic and financial issues beyond the remit of any one organization.
- The V20 is a bloc consists of countries most threatened by climate change including's members are Afghanistan, Bangladesh, Barbados, Bhutan, Costa Rica, East Timor, Ethiopia, Ghana, Kenya, Kiribati, Madagascar, the Maldives, Nepal, the Philippines, Rwanda, Saint Lucia, Tanzania, Tuvalu, Vanuatu and Vietnam.



INTERNATIONAL RELATIONS



China-Pakistan Economic Corridor

Context: External Affairs Minister made a reference to the China-Pakistan Economic Corridor (CPEC), part of China’s Belt and Road Initiative (BRI) in the Council of Heads of Government of the Shanghai Cooperation Organisation.

Present Status of the CPEC:

- A lot of the energy projects were completed.
- Some of the road projects have been completed, others not;
- The special economic zones were pared down to a smaller number than originally envisaged and have moved very slowly;
- Most of the projects around Gwadar are far from completion.
- There’s just been nothing significantly new agreed over the last few years from the much bigger package that was under negotiation.
- There were uncertainties about the economic feasibility of some of the larger projects — hydro-electric dams and railways.
- Gwadar is just very difficult as a location, in logistical and security terms.
- The current total that both sides cite is \$25 billion, and it was \$19 billion five years ago

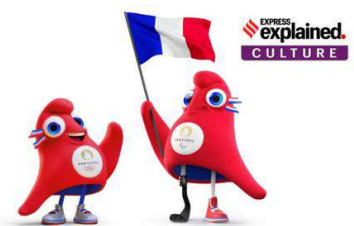


Les Phryges

Context: The mascots of Paris 2024 Olympic and Paralympic Games are designed like the red Phrygian cap and are called Les Phryges.

About Les Phryges:

- The Phryges are the official mascots of Paris 2024 Olympic and Paralympic Games.
- They are two little female anthropomorphic Phrygian caps that are a strong symbol of France.
- The Phrygian cap, a soft, generally red hat, was worn by freed slaves in Phrygia, an ancient Greek kingdom in what is now Turkey.
- The Phrygian cap originated in the ancient country of Phrygia (in modern Turkey).
- The French Revolution was also the time that the earliest representations of a woman wearing a Phrygian cap — the allegorical Marianne — made an appearance in art.
- It is also an international symbol of liberty present in many emblems in North and South America.



North Atlantic Treaty Organisation (NATO)

In News: NATO is in the eye of the storm after one of its member nations said that a Russian missile killed two of its citizens.

- Poland was considering whether it should launch NATO’s Article 4 procedure.
- Any attack on Poland, a NATO member, could drag the 30-nation strong alliance into the Russia-Ukraine conflict, risking a full-fledged nuclear war.

NATO’s article 4:

	<ul style="list-style-type: none"> • Article 4 of the treaty mandates that the member nations consult each other when faced with threat. • Article 5 spells out the ‘one-for-all, all-for-one’ nature of the treaty which says that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all. • Consequently, each of them, in self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked, to restore and maintain the security of the North Atlantic area. <p>North Atlantic Treaty Organisation or NATO:</p> <ul style="list-style-type: none"> • NATO is a Western defensive military alliance led by the United States. • It came into being after World War II as a counter to the Soviet Union’s possible expansion attempts in Europe. • 30 Members: Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, the United Kingdom, the United States, Greece, Turkey, Germany, Spain, Czechia, Hungary, Poland, Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, Slovenia, Albania, Croatia, Montenegro, and North Macedonia • Following the Russian invasion of Ukraine, Finland and Sweden applied for NATO membership and were invited to join the collective by 28 of the 30 members, with Turkey and Hungary being notable exceptions. Bosnia and Herzegovina and Georgia have expressed interest in joining the collective as well.
<p>United Nations Human Rights Council</p>	<p>In News: U.S., Belgium to question India on CAA, minority rights, hate speech at U.N. Human Rights Council.</p> <p>About UN Human Rights Council:</p> <ul style="list-style-type: none"> • The Human Rights Council is an inter-governmental body within the United Nations system responsible for strengthening the promotion and protection of human rights around the world. <p>Formation:</p> <ul style="list-style-type: none"> • The Council was created by the United Nations General Assembly in 2006. It replaced the former United Nations Commission on Human Rights. • The Office of the High Commissioner for Human Rights (OHCHR) serves as the Secretariat of the Human Rights Council. • OHCHR is headquartered in Geneva, Switzerland. <p>Members:</p> <ul style="list-style-type: none"> • It is made up of 47 United Nations Member States which are elected by the UN General Assembly (UNGA). • The UNGA considers the candidate States’ contribution to the promotion and protection of human rights, as well as their voluntary pledges and commitments in this regard. <p>The Council’s Membership is based on equitable geographical distribution. Seats are distributed as follows:</p> <ul style="list-style-type: none"> • African States: 13 seats • Asia-Pacific States: 13 seats • Latin American and Caribbean States: 8 seats • Western European and other States: 7 seats • Eastern European States: 6 seats • Members of the Council serve for a period of three years and are not eligible for immediate re-election after serving two consecutive terms.

Procedures and Mechanisms:
Universal Periodic Review:

- The UPR is a unique process which involves a review of the human rights records of all UN Member States.
- The UPR is a State-driven process, under the auspices of the Human Rights Council, which provides the opportunity for each State to declare what actions they have taken to improve the human rights situations in their countries and to fulfil their human rights obligations.
- **Advisory Committee:** It serves as the Council's "think tank" providing it with expertise and advice on thematic human rights issues.
- **Complaint Procedure:** It allows individuals and organizations to bring human rights violations to the attention of the Council.
- **UN Special Procedures:** These are made up of special rapporteurs, special representatives, independent experts and working groups that monitor, examine, advise and publicly report on thematic issues or human rights situations in specific countries.

European Securities and Markets Authority (ESMA)

Context: The European Union's financial markets regulator European Securities and Markets Authority (ESMA) said it will withdraw recognition of six Indian clearing bodies or central counterparties (CCPs).

These six CCPs are:

- Clearing Corporation of India (CCIL),
- Indian Clearing Corporation Ltd (ICCL),
- NSE Clearing Ltd (NSCCL),
- Multi Commodity Exchange Clearing (MCXCCL),
- India International Clearing Corporation (IFSC) Ltd (IICC) and
- NSE IFSC Clearing Corporation Ltd (NICCL).
- As per the European Market Infrastructure Regulations (EMIR), a CCP in a third country can provide clearing services to European banks only if it is recognized by the ESMA.

Role of these CCPs:
CCPs perform two main functions as the intermediary in a market transaction:

- clearing and settlement
- guarantee the terms of a trade.
- CCP is a system provider, who by way of novation interposes between system participants in the transactions admitted for settlement, thereby becoming the buyer to every seller and the seller to every buyer, for the purpose of effecting settlement of their transactions.
- A CCP is authorised by the RBI to operate in India under Payment and Settlement Systems Act, 2007.

About ESMA:

- The European Securities and Markets Authority (ESMA) is an independent European Union (EU) Authority that contributes to safeguarding the stability of the EU's financial system by enhancing the protection of investors and promoting stable and orderly financial markets.
- ESMA is the direct supervisor of specific financial entities:
 - Credit Rating Agencies (CRAs)
 - Securitisation repositories (SRs)
 - Trade Repositories (TRs)
- These entities form essential parts of the EU's market infrastructure.

	<p>Reason for derecognition: The decision to derecognise Indian CCPs came due to ‘no cooperation arrangements’ between the ESMA and Indian regulators:</p> <ul style="list-style-type: none"> • the Reserve Bank of India (RBI), • the Securities and Exchange Board of India (SEBI) and • the International Financial Services Centres Authority (IFSCA). • The ESMA wants to supervise these CCPs, which the Indian regulators are not in favour of as they feel that these entities have robust risk management and there is no need for a foreign regulator to inspect them. <p>Impact of Derecognition:</p> <ul style="list-style-type: none"> • These CCPs will no longer be able to provide services to clearing members and trading venues established in the EU. • The derecognition will impact the lenders as they will not be able to provide clearing and settlement facilities to their clients. • They will also have to set aside additional capital to trade in the domestic market. • Of the total foreign portfolio investors (FPI) registered in India, close to 20 per cent are from Europe.
<p>Moscow Format Consultations on Afghanistan</p>	<p>Context: Recently India participated in the fourth meeting of the Moscow Format Consultations on Afghanistan 2022 held in Moscow. The meeting saw participation from special envoys and senior officials from Russia, China, Pakistan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.</p> <p>About Moscow Format Consultations on Afghanistan:</p> <ul style="list-style-type: none"> • The Moscow Format Consultations on Afghanistan, launched in 2017, is a regional platform on Afghanistan involving the special envoys of Russia, Afghanistan, India, Iran, China, and Pakistan. • Its mandate is to facilitate political reconciliation between the then-internationally backed Kabul government and the Taliban, establish peace, and ensure regional security. <p>Moscow assumed the lead in this process based on its national concerns and interests in Afghanistan, most notably on two key issues.</p> <ul style="list-style-type: none"> • The first issue was centred around the potential threats due to the spread of instability, violence, and extremism in Afghanistan and the rest of Central Asia. • The second was related to the growing inflow of Afghan heroin to the Russian market. Geopolitical interests related to Moscow’s opposition to any US or Western security presence in Central Asia undergirds Russia’s motives to lead such processes. • April 2017 saw the first round of consultations with Russia, Afghanistan, India, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan in attendance. • Five years later, on November 16, 2022, all of these countries—minus Afghanistan—were invited.



HISTORY AND ART & CULTURE



Sardar Patel

In News: Personnel of the CRPF 151 battalion at Kaliveru in Charla mandal organised bike and cycle rallies in connection with the “Rashtriya Ekta Diwas” (National Unity Day)

- National Unity Day marks the birth anniversary of Sardar Vallabhbhai Patel on October 31.

Sardar Patel:

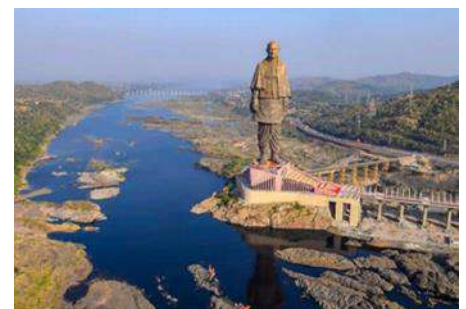
- First Home Minister and First Deputy Prime Minister of India
- He earned the title of “Sardar” by women of Bardoli after spearheading a no-tax campaign by peasants there.
- The Iron Man of India was the chief architect of India’s steel frame — the civil services and is remembered as “patron saint of India’s civil servants”.

Headed following Committees of the Constituent Assembly:

- Advisory Committee on Fundamental Rights.
- Committee on Minorities and Tribal and Excluded Areas.
- Provincial Constitution
- ‘Bismarck of India’ following his role in unifying the princely states.
- He was the President of INC 1931 session in Karachi.
- Toured during the Kheda campaign (1918) which was a success, supported Gandhi in Non-cooperation Movement (1920), was arrested during the Dandi Salt March (1930).
- He was awarded the Bharat Ratna posthumously in 1991. His birth anniversary is observed as Rashtriya Ekta Diwas (National Unity Day) since 2014.

Statue of Unity:

- The Statue of Unity is built in honour of Sardar Vallabhbhai Patel on Sadhu Hill.
- Standing at 182 meters in the middle of river Narmada at Kevadia in Gujarat’s Narmada district, the Statue of Unity is the tallest statue in the world— much taller than the 153 metre Spring Temple Buddha in China and almost twice the size of the Statue of Liberty in New York.
- One can have a view of the Satpura and Vindhya mountain ranges, which also form the point where Madhya Pradesh, Gujarat and Maharashtra meet.
- Visitors can also get a distant view of the 12-km-long Garudeshwar Reservoir which is located downstream from the Narmada dam.
- Man Behind the Statue: Shri Ram Vanji Sutar, the 93-year-old sculptor.
- In January 2020, it was added to the ‘Eight Wonders’ of the Shanghai Cooperation Organization (SCO).



Charminar

Context: Congress Leader Rahul Gandhi unfurls National Flag at Charminar.

About Charminar:

- Charminar was built by **Sultan Mohammed Quli Qutb Shah** in 1591.

- It was built in honour of his wife, Bhagmati.
- As per a popular belief, Charminar was built to acknowledge the elimination of the plague which had affected the entire city immensely during that era.
- The four pillars are also said to be dedicated to the first four caliphs of Islam.
- An Iranian architect Mir Momin Astrawadi, who had settled in Hyderabad, designed Charminar.
- The architectural design of Charminar is inspired from the Shia “tazias”.
- These Tazias were built in the memory of Hussain, who was the son in law of Prophet Muhammad and had lost his life in the battle of Karbala.
- Charminar has been built with granite and lime mortar and pulverised marble.
- On the top floor of Charminar there is a mosque which is believed to be the oldest mosque of Hyderabad city.
- The Charminar is situated on the east bank of Musi River.
- It is listed as an archaeological and architectural treasure on the official list of monuments prepared by the Archaeological Survey of India.
- **Charminar, along with the Qutb Shahi Monuments of Hyderabad: the Golconda Fort, and the Qutb Shahi Tombs, were included in the “tentative list” of UNESCO World Heritage Site.**
- The monument was submitted by the Permanent Delegation of India to UNESCO on September 10, 2010.



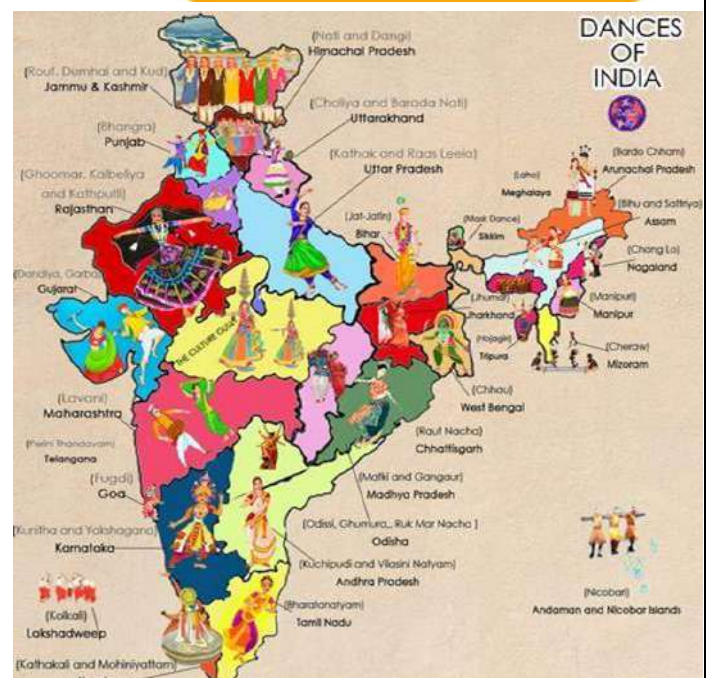
National Tribal Dance Festival 2022

Context: Chhattisgarh celebrates its 23rd State Foundation Day on 1st November 2022 and as a part of the celebrations, Raipur will host the 3rd National Tribal Dance Festival. The National Tribal Dance Festival will be celebrated from 1st November 2022 to 3rd November 2022.



About National Tribal Dance Festival:

- National Tribal Dance Festival is one of Chhattisgarh’s grand festivals which celebrates diverse tribal communities and their culture not just in India but from across the globe.
- It is organised under the **Tourism and Culture Department of Chhattisgarh.**
- This festival aims to unite the tribal communities and provides an opportunity to educate about their rich culture for all.



	<ul style="list-style-type: none"> • The first National Tribal Dance Festival was organised in 2019 and second in 2021. • The highlights of the National Tribal Dance Festival will be the other countries including Mongolia, Tongo, Russia, Indonesia, Maldives, and Mozambique participating in the event.
<p>Self Employed Women’s Association and Ela Bhatt</p>	<p>Context: Elaben Bhatt, The Gandhian, SEWA founder, and women’s empowerment activist dies.</p> <p>About Ela Bhatt:</p> <ul style="list-style-type: none"> • She was known as the “Gentle Revolutionary” who changed the lives of lakhs of women through her organisation, providing them with microloans for five decades. • She founded the Self-Employed Women’s Association (SEWA) in 1972. • She also headed the women’s wing of Majoor Mahajan Sangh-the Textile Labour Association founded by Anasuya Sarabhai and Mahatma Gandhi. • She was the chairperson of the Sabarmati Ashram Memorial and Preservation Trust, also co-founded the Women’s World Banking, a global network of microfinance organisations, of which she was chairperson from 1984 to 1988. • She was also nominated to Rajya Sabha, and was a member of the Planning Commission. • She had also acted as an advisor to organisations like the World Bank. • In 2007, she joined the Elders, a group of world leaders founded by Nelson Mandela to promote human rights and peace. • She was a prodigious writer who penned in Anasuya, our Gujarati newsletter, a play on street vendors. One of her famous book was “We are Poor but We are Many”. • She was a recipient of the Padma Bhushan, Ramon Magsaysay Award and Indira Gandhi International Prize for Peace among many other awards. <p>About Self-Employed Women’s Association (SEWA):</p> <ul style="list-style-type: none"> • SEWA was born out of the Textile Labour Association (TLA) founded by Anasuya Sarabhai and Mahatma Gandhi in 1920 but it could not register as a trade union until 1972 because its members did not have an “employer” and were thus not seen as workers. • In 1981, after the anti-reservation riots in which the Bhattas were targeted for supporting quotas for Dalits in medical education, the TLA broke up with SEWA. • As early as in 1974, SEWA Bank was established to provide small loans to poor women. • The Unorganised Workers Social Security Act (2008), the National Rural Livelihoods Mission (2011), and the Street Vendors Act (2014), are seen as successes of SEWA’s struggle. • The PM Street Vendors Aatmanirbhar Nidhi (PM-SVANidhi) scheme is seen as being inspired by SEWA’s microfinance model. • During the pandemic, SEWA launched Anubandh, an e-commerce platform to connect sellers with buyers, to keep kitchen fires burning through the lockdowns. • The efforts of SEWA to change the lives of over 2.1 million members and many more around the world have long been recognised as a model for the world.
<p>Guru Nanak Dev</p>	<p>Context: Recently the President of India has greeted fellow-citizens on the eve of Guru Nanak Dev Jayanti.</p> <p>About Guru Nanak Jayanti:</p> <p>Early Life:</p> <ul style="list-style-type: none"> • He was born on April 15, 1469, at Rai Bhoi Ki Talwandi, near Lahore, which is in the Sheikhpura district of modern-day Pakistan. 

- He was born into a middle-class Hindu family and raised by his parents, Mehta Kalu and Mata Tripta.

Founder of Sikhism:

- He was the first of the 10 Sikh Gurus and the founder of Sikhism in the 15th century.
- He started writing the Guru Granth Sahib and completed 974 hymns.

His Teachings:

- He advocated the 'Nirguna' (devotion to and worship of formless divine) form of bhakti.
- Guru Nanak Dev Ji spread the message of 'Ek Omkar' which means that God is one and is present everywhere.
- He set up rules for congregational worship (Sangat) involving collective recitation.
- Guru Nanak Dev Ji also gave the message of humility and service to mankind.
- His verses also preach selfless service to humanity, prosperity and social justice for all, irrespective of differences.
- He inspired us to practise love, unity and brotherhood.
- One should adopt eternal values like truth, sacrifice and moral conduct from the teachings of 'Japji Sahib'.
- Guru Nanak travelled across South Asia and the Middle East to spread his teachings.
- The messages of 'Kirat Karo' and 'Vand Chhako' inspire us to live with honesty and share the available resources with others.

Steps in his honour:

Nankana Sahib:

- A Gurdwara was built at his birthplace in the city now known as Nankana Sahib. It is located in the Punjab province of Pakistan.

Kartarpur corridor:

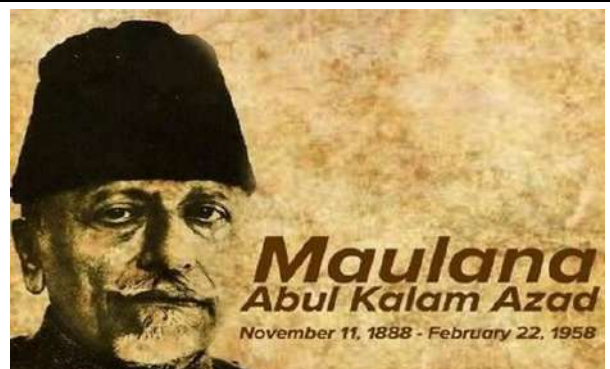
- The corridor was built to commemorate the 550th birth anniversary celebrations of Guru Nanak Dev, founder of Sikhism on 12th November 2019.
- It is one of the holiest places for Sikhs where Baba Guru Nanak Dev Ji settled and preached for the last 18 years of his life.
- It is also known as Gurburab and is the most important festival for the followers of the religion of Sikhism as the birth anniversary of the first Sikh Guru, Guru Nanak Dev.
- The festival is celebrated on the day of Kartik Poornima, which is the fifteenth lunar day in the month of Kartik according to the Hindu calendar, and usually falls in the month of November by the Gregorian calendar.

Maulana Abul Kalam Azad

Context: Recently, the Prime Minister of India paid tributes to Maulana Azad on his birth anniversary.

Personal details:

- **Born:** November 11, 1888; **Place of Birth:** Mecca, Saudi Arabia
- **Political Ideology:** Liberalism; right-winged; Egalitarian
- **Publications:** Ghubar-e-Khatir (1942-1946); India Wins Freedom (1978); weekly called "Al-Hilal" and "Al-Balagh".
- On February 22, 1958 Maulana Abul Kalam Azad, one of the foremost leaders of the Indian freedom struggle passed away.



- For his invaluable contribution to the nation, Maulana Abul Kalam Azad was posthumously awarded India's highest civilian honour, the 'Bharat Ratna' in 1992.
- He was the founder of the Jamia Milia Islamia Institution in Delhi along with fellow khilafat leaders which has blossomed into a renowned University today.
- His birthday, November 11, is celebrated as National Education Day in India.

Early Revolutionary Activities:

- In Egypt, Azad came into contact with the followers of Mustafa Kemal Pasha who were publishing a weekly from Cairo.
- In Turkey, Maulana Azad met the leaders of the Young Turks Movement.
- After his return to India from an extensive visit of Egypt, Turkey, Syria and France, Azad met prominent revolutionaries Sri Aurobindo Ghosh and Shyam Sundar Chakraborty.
- Azad fiercely criticized the Muslim politicians who were more inclined towards the communal issues without focusing on the national interest.
- He also rejected the theories of communal separatism advocated by the All India Muslim League.

Pre-Independence Activities

- As an activist demanding the reinstatement of the Caliph in Istanbul, Maulana Abul Kalam Azad came onboard with the Khilafat movement during 1920.
- He became involved with the Indian freedom struggle through the Non-cooperation movement initiated by Gandhi, of which the Khilafat issue was a big part of.
- Although initially skeptical of Gandhi's proposal to launch an intensified drive against the British Raj demanding independence, he later joined the efforts.
- He wholeheartedly advocated the principles of the non-cooperation movement and in the process became drawn to Gandhi and his philosophy.
- He worked closely with Vallabhbhai Patel and Dr. Rajendra Prasad.
- He vehemently opposed the idea of partition based on religion and was deeply hurt when the idea went forward to give rise to Pakistan.
- He presided over the special session of Congress in September 1923 and was said to be the youngest man elected as the President of the Congress.
- In 1928, Maulana Azad endorsed the Nehru Report, formulated by Motilal Nehru.
- As opposed to Muhammad Ali Jinnah, Azad also advocated for the ending of separate electorates based on religion and called for a single nation committed to secularism.
- In 1930, Maulana Azad was arrested for violation of the salt laws as part of Gandhiji's Salt Satyagraha.

Post-Independence Activities

- During the violence that erupted following partition of India, Maulana Azad assured to take up the responsibility for the security of Muslims in India.
- He helped in establishing the refugee camps and ensured uninterrupted supply of food and other basic materials.
- He was appointed as India's first Minister for Education and inducted in the Constituent Assembly to draft India's constitution.
- Under Maulana Azad's tenure, a number of measures were undertaken to promote primary and secondary education, scientific education, establishment of universities and promotion of avenues of research and higher studies.

Tomb of Afzal Khan

Context: The Supreme Court sought reports from Maharashtra administration on the demolition drive conducted around the tomb of Afzal Khan, a 17th-century commander of the Adil Shahi dynasty of Bijapur.

About Afzal Khan:

- Afzal Khan was a general who served the Adil Shahi dynasty of Bijapur Sultanate.
- He played an important role in the southern expansion of the Bijapur Sultanate by subjugating the Nayaka chiefs who had taken control of the former Vijayanagara territory.
- In 1659, the Bijapur government sent Afzal Khan to subjugate Chatrapati Shivaji Maharaj, a former vassal who had started acting independently.
- He was killed at a truce negotiation meeting with Chatrapati Shivaji Maharaj, and his army was defeated at the Battle of Pratapgad.'

History of Afzal Khan's tomb:

- With Shivaji's rise and increasing control of the region, Afzal Khan was seen as the man to subdue him in the Deccan.
- Khan put together a force of 10,000 cavalry and marched from Bijapur to Wai, plundering Shivaji's territory along the way.
- Shivaji called a council of war at the fort of Pratapgarh, where most of his advisers urged him to make peace.
- Shivaji was not eager to back down and he set up a meeting with Khan.
- Afzal Khan was killed on November 10, 1659 when during a meeting, an embrace between the two turned into an attack in which Shivaji emerged victorious.
- Khan's remains were buried at the fort and a tomb was constructed on Shivaji's orders.
- The tower is still known by the name 'Afzul Buruj' at Pratapgarh.

Sir CP Ramaswamy Iyer

Context: Amid the ongoing tussle between the LDF government in Kerala and Governor, senior BJP leader and state education minister traded allegations over erstwhile Travancore Diwan Sir CP Ramaswamy Iyer.

About Sir CP Ramaswamy Iyer:

- Sir C.P. Ramaswamy Iyer, popularly known as 'Sir CP' or simply CP was an able lawyer, efficient administrator and astute politician.
- He graduated with distinction from the Madras Law College in 1901.
- He used to spend his college vacations with Sir K. Seshadri Iyer, the Dewan of Mysore and got inspiration from him.
- He was the Dewan of the erstwhile Travancore princely state from 1936 to 1947.
- Under his Dewanship, Travancore became the first princely state to abolish capital punishment, first to introduce free and compulsory education, first to introduce universal adult franchise and the first to be connected to the rest of India by air.
- The proposed bicameral legislature for the Travancore comprised of the Sri Mulam Assembly (First Chamber) and the Sri Chithira State Council (Second Chamber) and Sir C.P, was the President of both.



- In 1936, Sri Chithira Thirunal personally requested Sir C.P. Ramaswami Iyer to serve as the Dewan of Travancore which he accepted and served for ten years.
- In 1936, at the instance of Sir C.P, Sri Chithira Thirunal issued the famous Temple Entry Proclamation which gave Hindus of all castes and classes, including Harijans or untouchables, the right to enter Hindu temples in the state.
- Mahatma Gandhi and other social reformers praised the Maharaja and the Dewan for this proclamation though the conservative Hindus opposed it.
- Sir CP was the first person in India to suggest a plan for interlinking the rivers in the country and is also credited with the establishment of several hydro-electric power projects.
- He established the Pallivasal Hydro-electric power project on the Periyar River and initiated the Pechipara Hydro-electric Scheme and the Periyar Wildlife Sanctuary project.
- In 1940, under his Dewanship, Travancore became the first state to nationalize road transport in India.
- The first cement highway in India between Trivandrum and Kanyakumari covering a distance of 88 kms was constructed during his tenure.
- Sir CP started the University of Travancore (subsequently named as Kerala University) in 1937 with the Maharaja Sri Chithira Thirunal as the Chancellor and himself as the Vice Chancellor.
- He was awarded an honorary doctorate by the University of Travancore in 1939. He also renovated the Padmanabhapuram Palace built during Marthanda Varma's time and expanded the Trivandrum Art Gallery.
- Sir CP was the first to introduce the midday meal scheme in the form of the Vanchi Poor Fund in Travancore to encourage poor children to attend school.
- He established the Fertilizers and Chemicals of Travancore, the first fertilizer plant in India with American collaboration.
- He also established the Travancore Cement Co., the Travancore Titanium Co. and the Travancore Rayons Limited.
- The state revenue increased four-fold during his tenure as the Dewan.
- Sir CP was the patron of the Trivandrum Club and the Travancore Athletic Association. He was the Chairman of the Travancore State Sailer Soldiers and Armies Board, member of the Indian Rubber Production Board and President of the Society for the Prevention of Cruelty to Animals.
- Some of his literary works are: Indian Universities: Retrospect's and Prospects; Religion, Man and Other Essays; Biographical Vistas; Pen Portraits; Fundamentals of Hindu Faith and Culture; Cultural Freedom of Some Eminent Indians; At the Crossroads, Phases of Religion and Culture; World Religions-A study in synthesis; World Culture and India; Treatment of Landscape in Eastern and Western Poetry etc.
- Sir CP has been criticized as an authoritarian and anti-Communist but despite his animosity with the Communists, he opposed as "unconstitutional" the dismissal of the elected Communist government of Kerala in 1959.

E.K. Janaki Ammal

In news: The book, E. K. Janaki Ammal: Life and Scientific Contributions was released in English by Nirmala James, on the scientist's 125th birth anniversary.

- It is the third book by Ms. James. The first two were in Malayalam.

About: India's first woman botanist



Born on November 4, 1897, in Kerela

Achievements:

- Notable work in the areas of cytogenetics and plant breeding.
- Carried out important work on sugarcane, brinjal and magnolias.
- Collaborated with C. D. Darlington to bring out the chromosome atlas of cultivated crops and their wild relatives
- She received the Padma Shri in 1977
- In the 1930s, she had taught botany in the Maharaja's College of Science, Thiruvananthapuram
- Appointed a member of the Travancore Public Recruitment Committee.
- She strongly raised her voice for women, arguing that married women should not be disqualified from entering or continuing in service.
- Fulfilled her professional dreams, in spite of the gender and caste barriers (Thiya family) of her time.
- Accomplished all this in an era when women's education was not considered important.

Birsa Munda

In news: On the birth anniversary of tribal leader Birsa Munda, the Centre marked the second Janjatiya Gaurav Divas to celebrate the contributions of tribal communities to Indian culture.

- President Droupadi Murmu, India's first tribal woman president, visited the birthplace of 'Bhagwaan' Birsa Munda and paid floral tributes.
- The statue of Alluri Sitharama Raju was inaugurated by the Prime Minister this year.

About Munda tribe:

- Inhabited the Chota Nagpur region of today's Jharkhand.
- The British introduced a feudal zamindari system, destroying the tribal "Khuntkatti" agrarian and land ownership system that was more community-based.
- The Raj brought in outsiders like moneylenders and contractors, as well as feudal landlords to aid them.
- With the impact of British rule and activities of Christian missionaries, many tribals became critical of the British and missionaries' presence.

About Birsa Munda:

- Born in 1875 in Ulihatu village in the Khunti district of Jharkhand.
- Received his early education under the guidance of his teacher Jaipal Nag
- Converted to Christianity in order to join the German Mission school but opted out of the school later.
- From 1886 to 1890, he spent a large amount of time in Chaibasa, which was close to the centre of the Sardari agitation.
- The Sardars' activities had a strong impact on him and he became a part of the anti-missionary and anti-government programmes.
- He soon emerged as a tribal leader who brought people together on fighting for these issues.
- He became a God-like figure, leading the faith of 'Birsait' which was joined by members of the Munda and Oraon communities to challenge British conversion activities.



- On March 3, 1900, Munda was arrested by the British police while he was sleeping with his tribal guerilla army at Jamkopai forest in Chakradharpur and died in Ranchi jail due to an illness on June 9, 1900, at the young age of 25.

His Contributions:

- In 1899, he started the Ulgulan movement which involved the use of weapons and guerrilla warfare to drive out foreigners.
- Encouraged by Birsa Munda, the tribals refused to follow colonial laws and paying rent and challenged religious practices to fight against superstition
- Due to this, Birsa Munda began to be known as 'Bhagwan' (God) and 'Dharati Aba' (Father of the earth) by his followers.
- He played a significant role in mobilising the tribal community against the British.
- Birsa Munda's struggle led to the passing of the Chotanagpur Tenancy Act in 1908 which restricted passing of land from the tribal people to non-tribals.

Bali Yatra and The Kalinga Empire

Context: Recently during the G20 Summit, Prime Minister of India mentioned Baliyatra, literally 'voyage to Bali', one of the country's largest open-air fairs that commemorates the 2,000-year-old maritime and cultural links between ancient Kalinga and Southeast Asia.

About Bali Yatra and the Kalinga Empire:

- Bali Yatra, a festival that commemorates the rich maritime history of Odisha is celebrated throughout the state.
- In the historic city of Cuttack, a week-long event is organised starting from the day of Kartika Purnima (full moon day in the month of Kartik i.e October-November).
- The Kalinga Empire (present-day Odisha) is known for its glorious maritime history. Due to the geographical location of Kalinga, this area saw the growth of ports as early as the 4th and the 5th century BC.
- Some of the famous ports, Tamralipti, Manikpatna, Chelitalo, Palur, Pithunda allowed India to connect with other countries via the sea.
- Bali formed a part of the four islands that were collectively called the Suvarnadvipa, today known as Indonesia as their major trade hub along with other islands in the region.
- The Kalingas constructed large boats called the 'Boitas' and with the help of these, they traded with the Indonesian islands.
- These ships had copper hulls and could carry up to seven hundred men and animals aboard. Interestingly, the Bay of Bengal was once known as the Kalinga Sea as it was thronged by these ships.



- The dominance of the Kalingas over the sea routes can be understood from the fact that Kalidasa in his Raghuvamsa referred to the King of Kalinga as ‘The Lord of the Sea’.



- The Kalingas frequently traded with the island of Bali. The trade-in commodities also led to the interchange of ideas and beliefs.
- Odia merchants formed settlements in Bali and influenced its culture and ethics. This led to the growth of Hinduism in the region.
- Interestingly, the ‘Masakapan ke Tukad’ festival celebrated in Bali is similar to the Bali Yatra festival in Odisha. Both festivals are celebrated in the memory of their maritime ancestors.
- The term Bali Yatra literally means ‘Voyage to Bali’.
- Every year Kartika Purnimamarks the day that the seafaring traders departed for the Indonesian islands.
- Indian women perform ‘Boita Bandana’, they make boats of paper or banana leaf (sholapith) with lighted lamps inside and float them down the Mahanadi as a part of the celebrations.

Uda Devi

Context: On November 16, events to commemorate the martyrdom of Uda Devi, a freedom fighter from the Pasi community, were held at various places in Uttar Pradesh, including Sikandar Bagh in Lucknow.

- Uda Devi The Dalit Women Warrior from Lucknow Who Single-Handedly Killed Over 30 British Soldiers In 1857 Rebellion.

About Uda Devi:

Personal life:

- Uda Devi was born in a small village in Awadh, Uttar Pradesh. Seeing the rising anger of the Indian people against the British administration, she reached out to Begum Hazrat Mahal to enlist for war.
- In order to prepare for the battle that was headed their way, the Begum helped her form a women’s battalion under her command.
- Uda Devi and her Dalit sisters were the warriors or Veeranginis (amazons/heroines) of the 1857

UDA DEVI

A Dalit freedom fighter, Uda Devi and her courageous Dalit sisters or Veeranginis (warriors) fought fearlessly against the British East India Company, infamous for looting local resources. Admirers remember her as a feisty and valiant Dalit woman who defied both caste and gender hierarchies enforced by the brahminical and patriarchal society.

Indian Rebellion against the British East India Company.

Role in the Revolt of 1857:

- In the centre of an intersection outside Sikandar Bagh in Lucknow, stands a statue of a patina-covered, sexually ambiguous figure carrying a rifle and walking forward with a determined glare.
- The inscription on the base of the statue named the figure as Uda Devi Pasi, a heroine of the Mutiny of 1857.
- In the fall of 1857, northern India was in a state of virtual anarchy. A general revolt against the growing hegemony of the British East India Company consumed the cities of Delhi, Jhansi and Kanpur.
- During this ‘Second relief of Lucknow,’ Campbell’s 93rd Highland Regiment advanced along the Southern bank of the Gomti until they reached the Palace of Sikandarbag.
- The British forces met desperate resistance from rebels who had fortified the position. In the battle that followed, over 2,000 rebels and many soldiers lost their lives in hand-to-hand combat.
- After the British overran Sikandarbag, an officer noted that many of the British casualties had bullet wounds indicating a steep, downward trajectory. Suspecting that a sniper remained hidden in a nearby pipal tree, British officers fired at the tree and dislodged a rebel who fell to the ground with a thud, dead.
- Further investigation revealed that the rebel was in fact, a non-dominant caste woman named Uda Devi Pasi, who had donned men’s clothing to participate in the uprising.

Contemporary Influence:

- Today Uda Devi is an inspiration to women from non-dominant castes. Each year, on November 16, members of the Pasi caste gather at the sight of her final plunge and celebrate her as an anti-imperialist rebel who defied convention and struck a blow for the embryonic cause of Indian Independence.
- For Pasis, traditionally a caste of pig-herders and toddy-tappers, Uda Devi Martyrdom Day is the day to revel in the bravery and martial spirit of their ancestors and to chant the rousing slogans, Uda Devi amar rahe! (Uda Devi is immortal!) and Uda Devi Zindabad! (Long live Uda Devi!).

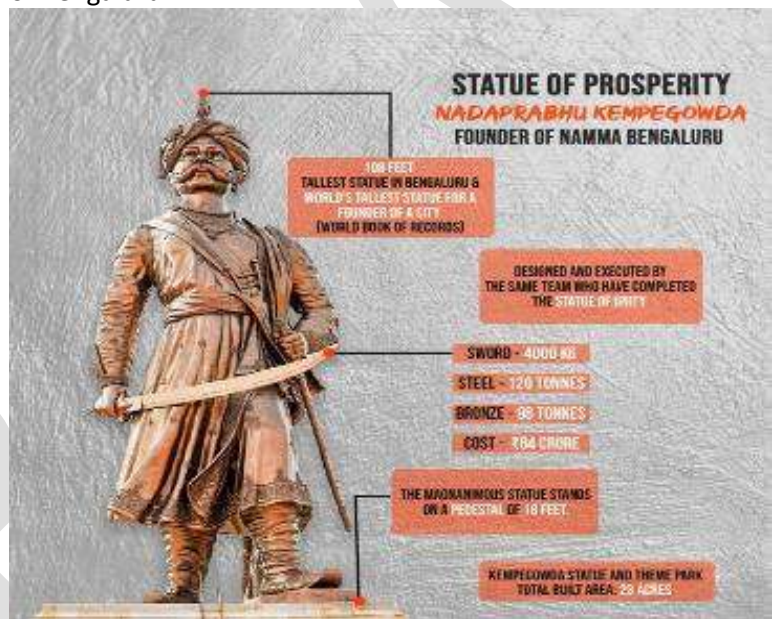
The sword of Chhatrapati Shivaji Maharaj

Context: The Maharashtra government recently announced that it is working to bring back the sword of Chhatrapati Shivaji Maharaj from London to India.

About the Sword:

- It was given to Edward, the Prince of Wales (the later King Edward VII), by Shivaji IV in 1875-76.
- The sword is part of the Royal Collection Trust at Saint James’s Palace in London.
- Shivaji IV was barely 11 years old then, and like many other Indian kings of the time, he was forced by the British to “gift” them valuable presents, which included weapons with historical significance.
- The first effort was made by Lokmanya Bal Gangadhar Tilak, when he visited London to fight a suit of libel.
- Subsequently, the Marathi poet and playwright Ram Ganesh Gadkari, who wrote under the pen name of Govindagraj, made references to the sword in a poem.
- After independence, the first Chief Minister of Maharashtra, Yashwantrao Chavan, pursued the matter.

	<ul style="list-style-type: none"> • Later, Chief Minister A R Antulay announced efforts to bring the sword back, and started collecting documents to build a case for India. • At the time, however, the sword was referred to as the “Bhavani” sword, and the British argued that a sword of that name is already there in Maharashtra’s Satara district. <p>The Bhavani and Jagdamba swords:</p> <ul style="list-style-type: none"> • The “Bhavani” sword, now in Satara, was also used by Chhatrapati Shivaji Maharaj. • But this sword is different from the one in London, which is called “Jagdamba” in the catalogue of Chhatrapati of Karveer.
<p>Unveiling of a statue of the 16th-century founder of Bengaluru - Nadaprabhu Kempe Gowda</p>	<p>Context: It is the “first and tallest bronze statue of a founder of a city,” as per ‘World Book of Records’. The monument is named as the “Statue of Prosperity”.</p> <ul style="list-style-type: none"> • It has been built to commemorate the contribution of Kempe Gowda, the founder of the city, towards the growth of Bengaluru. • Renowned sculptor and Padma Bhushan awardee Ram Vanji Sutar has designed the statue. <p>About Nadaprabhu Kempe Gowda:</p> <ul style="list-style-type: none"> • Nadaprabhu Hiriya Kempe Gowda, also known as Kempe Gowda was a chieftain under the Vijayanagara Empire. • The city of Bengaluru, which is the capital of the Indian state of Karnataka, was fortified by Kempe Gowda in 1537. • A successor of descendants of Morasu Gowda lineage started as Yelahankanadu Prabhus (ruler of Yelhankanadu). The Yelahankanadu Prabhus belonged to Gowda community. • Kempe Gowda’s initial plan for the city was to have temples, a fort, water tanks, and a cantonment. After receiving permission from emperor Achyutharaya, the chieftain built the Bangalore Fort and town in AD 1537. • Kempe Gowda has been credited for abolishing the practice of cutting the fingers of the left hand of an unmarried woman during a custom known as Bandi Devaru. • Kempe Gowda knew multiple languages, besides Kannada, and even authored a Yakshaganam play in Telugu named Gangagaurivilasa. • Political Significance: After Lingayats, Vokkaliga is the second most dominant community in Karnataka and Kempe Gowda is its most iconic figure.
<p>Pashmina Shawls</p>	<p>In news: Traders of universally-prized Pashmina shawls are complaining that “obsolete testing methods” such as ‘Light Microscopy’ have resulted in several cases of ‘false positive’ for presence of ‘Shahtoosh’ guard hair.</p> <ul style="list-style-type: none"> • This has led to their export consignments being flagged and wrongful prosecution.



- Pashmina Exporters and Manufacturers Association have moved a petition before the Delhi High Court, for a direction to improve the existing testing infrastructure by incorporating the modern



- ‘Scanning Electron Microscopic’ technique and DNA tests.
- In 2019, the Bureau of Indian Standards (BIS) published an Indian Standard for identification, marking and labelling of Pashmina products to certify their purity.
- In 2021, the BIS released a revised report titled ‘Identification, Labelling and Marking of Pashmina Products’ that mandated directions for incorporating qualitative and quantitative identification of Shahtoosh guard hair.

About Pashmina:

- Pashmina is obtained from breeds of mountain goats (*capra hircus*) found in the Changthang Plateau in Tibet and parts of Ladakh, in the Himalayan region of India.
- Manufacture of Pashmina is a largely unorganised cottage/handicraft industry providing employment and livelihood to approximately 6 lakh people, most notably to local skilled villagers and artisans in Kashmir.
- Shahtoosh is the fine undercoat fibre obtained from the Tibetan Antelope, known locally as ‘Chiru’, a species living mainly in the northern parts of the Changthang Plateau in Tibet.
- As they offer high levels of smoothness and warmth, Shahtoosh shawls became a highly expensive commodity.
- Unfortunately, due to commercial poaching of the animal, their population declined dramatically.
- Tibetan Antelope
- Appendix 1 of CITES (included in 1979) leading to prohibition in sale and trade of Shahtoosh shawls and scarves.
- IUCN: near threatened
- Schedule I of the India’s Wildlife (Protection) Act
- India contributes only about 1% of the world’s Pashmina, but the Pashmina produced in India is considered the best of the lot and occupies a unique position.



GEOGRAPHY

**Banana**

Context: A science writer writes in BBC that the banana tree is equated to Lord Brihaspati (Jupiter) for fertility and bounty. Thus, bananas are considered sacred.

About Banana:

- Banana, basically a tropical crop, grows well in a temperature range of 15°C – 35°C with relative humidity of 75-85%.
- Deep, rich loamy soil with pH between 6.5 – 7.5 is most preferred for banana cultivation.
- Saline solid, calcareous soils are not suitable for banana cultivation.
- There are some 12-15 varieties of bananas in India.
- Largely in the peninsular southern coastal region, namely in parts of Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, Telangana, Andhra Pradesh, Odisha, and Bengal, and in the Northeastern areas of the country such as Assam and Arunachal Pradesh.
- The central and northern regions – Madhya Pradesh, Uttar Pradesh, Haryana, and Punjab also grow the plant but neither in such variety nor in numbers.
- India produces about 29 million tonne of banana every year, and next is China with 11 million.

Nutritive value

- Bananas have 10-20 mg of calcium, 36 mg of sodium, 34 mg of magnesium and 30-50 mg of phosphorous per 100 g of edible material.
- All these make bananas highly nutritious.
- Its peel is of use as a 'biochar,' which is used both as a fertilizer and to generate electricity.
- Biochar is a charcoal-like substance that's made by burning organic material from agricultural and forestry wastes (also called biomass) in a controlled process called pyrolysis.
- Pyrolysis is the heating of an organic material, such as biomass, in the absence of oxygen.

Banana production in India state wise:

Banana producing state - Share %

- 1) Andhra Pradesh - 16.27
- 2) Maharashtra - 13.69
- 3) Gujarat - 14.54

Banana production in the world:

- Asian banana production accounts for about 54% of the entire production.
- India and China have been the world's biggest banana producers accounting for over 40% of the world's total banana production.
- Most bananas produced in India and China are consumed domestically, whereas the Philippines supplies bananas to the international markets.
- Ecuador is the world's largest banana exporter.

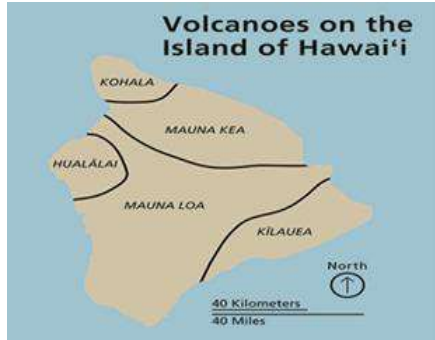
Banana season in India:

- Banana season in India prevails throughout the year.
- On the other hand, banana arrivals begin to increase in April and peak between August and October.
- Bananas, primarily tropical crops, thrive in temperatures ranging from 15 to 35 degrees Celsius and relative humidity levels of 75% to 85%.

- The planted crop is ready for harvest 12-15 months after planting, and the primary harvesting season of bananas is from September to April.
- Banana season throughout the year: Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Manipur, Assam and Tripura.
- September-November season: Gujarat, Bihar and Uttar Pradesh.

Mt. Mauna Loa

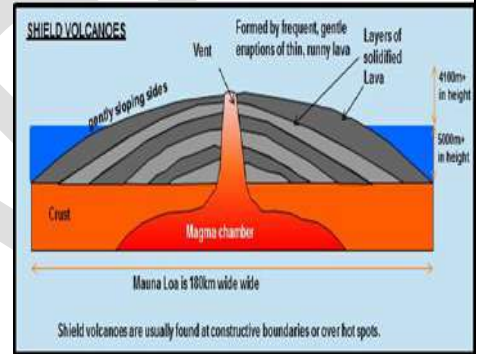
Context: The ground is shaking and swelling at Mauna Loa, the largest active volcano in the world, indicating that it could erupt.



About Mauna Loa:

- Mauna Loa is one of five volcanoes that together make up the Big Island of Hawaii, which is the southernmost island in the Hawaiian archipelago.
- It's not the tallest (that title goes to Mauna Kea) but it's the largest and makes up about half of the island's land mass.
- Mauna Loa last erupted 38 years ago.

- In written history, dating to 1843, it's erupted 33 times.
- Mauna Loa has a much larger magma reservoir than Kilauea, which may allow it to hold more lava and rest longer between eruptions than Kilauea.
- Hawaii volcanoes like Mauna Loa tend not to have explosion eruptions.
- That's because their magma is hotter, drier and more fluid.
- The gas in the magma of Hawaii's volcanoes tends to escape, and so lava flows down the side of their mountains when they erupt.
- Hawaii's volcanoes are called shield volcanoes because successive lava flows over hundreds of thousands of years build broad mountains that resemble the shape of a warrior's shield.



Early warning systems in Himalayan States

Context: The National Geophysical Research Institute (NGRI) of the Council of Scientific and Industrial Research has begun field studies to put in place an early-warning system in the Himalayan States.

About CSIR:

- The Council of Scientific & Industrial Research (CSIR), known for its cutting edge R&D knowledge base in diverse S&T areas, is a contemporary R&D organization.
- Headquarters: New Delhi
- CSIR is funded by the Ministry of Science and Technology and it operates as an autonomous body through the Societies Registration Act, 1860.

Organisational Structure:

- President: Prime Minister of India (Ex-officio)
- Vice President: Union Minister of Science and Technology (Ex-officio)
- Governing Body: The Director-General is the head of the governing body.
- The other ex-officio member is the finance secretary (expenditures).
- Other members' terms are of three years.

CSIR Advisory Board:

- 15-member body composed of prominent members from respective fields of science and technology. Its function is to provide science and technology input to the governing body.
- Member terms are of three years.

Significance of CSIR:**Strategic Sector:**

- **Drishti transmissometer:** It is an Indigenous – Innovative –Cost-effective visibility measuring system that provides information to pilots on visibility for safe landing & take-off operations and is suitable for all airport categories.
- **Head-Up-Display (HUD):** CSIR-National Aerospace Laboratories (NAL) developed an indigenous Head-Up- display (HUD) for Indian Light Combat Aircraft, Tejas.
- HUD aids the pilot in flying the aircraft and in critical flight manoeuvres including weapon aiming.
- **Indigenous Gyrotron:** Design and development of indigenous gyrotron for nuclear fusion reactors have been accomplished.
- A gyrotron is a vacuum electronic device (VED) capable of generating high-power, high-frequency THz radiation.

Energy & Environment:

- **Solar Tree:** It was designed by CSIR- The Central Mechanical Engineering Research Institute (CMERI) lab in Durgapur. It occupies the minimum space to produce clean power.
- **Lithium-Ion Battery:** The Central Electrochemical Research Institute (CECRI), Karaikudi in Tamil Nadu, has set up the first indigenous Li-ion fabrication facility that has applications in defence, solar-powered devices, railways and other high-end usages.

Agriculture:

- **Samba Mahsuri Rice Variety:** CSIR in collaboration with ICAR developed an improved bacterial blight-resistant Samba Mahsuri variety.
- **Rice Cultivar (Muktashree) for Arsenic Contaminated Areas:** A rice variety has been developed which restricts assimilation of Arsenic within the permissible limit.
- **White-fly Resistant Cotton Variety:** Developed a transgenic cotton line which is resistant to whiteflies.

Healthcare:

- **JD Vaccine for Farm Animals:** Vaccine developed and commercialized for Johne's disease (JD) affecting Sheep, goats, cows and Buffalo so as to immunize them and increase milk & meat production.
- **Plasma Gelsolin Diagnostic Kit for Premature Births, and Sepsis-related Deaths** to diagnose premature birth and sepsis.
- **GOMED:** A programme called GOMED (Genomics and other omics technologies for Enabling Medical Decision) has been developed by the CSIR which provides a platform for disease genomics to solve clinical problems.

Food & Nutrition:

- **Ksheer-scanner:** It is a new technological invention by CSIR-Central Electronics Engineering Research Institute (CEERI) to detect the level of milk adulteration and adulterants in 45 seconds at the cost of 10 paise.
- **Double-Fortified Salt:** Salt fortified with iodine and iron has improved properties developed and tested for addressing anaemia in people.
- **Anti-obesity DAG Oil:** Oil enriched with Diacylglycerol (DAG) instead of conventional triacylglycerol (TAG) developed.

Water:

- Aquifer Mapping of Water Scarce Areas: Heliborne transient electromagnetic and surface magnetic technique-based aquifer mapping was carried out in six different geological locations in Rajasthan (2), Bihar, Karnataka, Maharashtra and Tamil Nadu.
- Understanding the Special Properties of Ganga Water: An assessment of water quality & sediment analysis of Ganga from different parts being done.

Waste to Wealth:

- Non-toxic radiation shielding materials utilizing industrial waste like red mud (from aluminium industries) and fly ash (Thermal Power Plants) developed which have been accredited by Atomic Energy Regulatory Board (AERB) for application in diagnostic X-Ray rooms.
- Waste Plastic to Fuel: Process for conversion of waste plastics to gasoline/diesel or aromatics developed.

Traditional Knowledge Digital Library:

- CSIR has established the first-ever 'Traditional Knowledge Digital Library' in the world. It is accessible in five international languages (English, German, French, Japanese and Spanish).
- CSIR successfully challenged the grant of patent in the USA for use of Haldi (turmeric) for wound healing and neem as an insecticide on the basis of traditional knowledge.
- Genome sequencing: CSIR completed the sequencing of the Human Genome in 2009.
- Computing: Flo solver, India's first parallel computer was built in 1986. Flo solver's success triggered other successful parallel computing projects in the country such as PARAM.
- CSIR envisages a vision of CSIR@2030 as to "Enhance quality of life of the citizens of India through innovative Science and Technology, globally competitive R&D, by developing sustainable solutions and capacity building to fulfil dream of Aatmanirbhar Bharat".
- This vision of CSIR is aligned to the Government of India's vision for the next 25 years 'Amrit Kal' when independent India becomes 100 years old.

About NGRI:

- The **National Geophysical Research Institute (NGRI)**, a constituent research laboratory of the **Council of Scientific and Industrial Research (CSIR)** was established in 1961 with the mission to carry out research in multidisciplinary areas of the highly complex structure and processes of the Earth system and its extensively interlinked subsystems.
- **NGRI is situated in Hyderabad.**

The research activities fall broadly under three themes:

- **Geodynamics**, which revolve round investigating and modelling fundamental aspects of the Earth system and processes.
- **Earthquake Hazards**, which encompass features on the surface and subsurface of crust which may potentially endanger lives and properties through catastrophes like earthquakes and
- **Landslides** as well as deterioration in pollution levels of groundwater and soil, changes in climatic conditions and associated environmental issues.
- The Institute is structured into seven major R&D Groups and twenty one Activities, which include expertise in a variety of geophysical, geochemical, geological techniques like Seismology, Magnetotellurics, GPS, Paleo-seismology, Structural geology, Controlled source seismics, Gravity and Magnetics, Geochemistry, Geochronology, Paleomagnetism, Planetary geology, Geomagnetism, Airborne geophysics, Shallow subsurface geophysics

and Rock Mechanics, Hydrochemistry, Paleo-environmental studies and Modelling and simulation of Earth processes.

About Early warning systems in Himalayan States

Application:

- Against major and sudden floods, rockslides, landslips, glacier lake bursts and avalanches and to prevent Chamoli kind of disasters in future.

Significance:

- These instruments are crucial for the safety of large infrastructure projects and hydroelectric power plants in this region.
- The NGRI has started utilising Machine Learning to detect these observations faster than the normal approach because time becomes crucial during a warning.

Mahanadi Coalfields Ltd (MCL)

In News: The Supreme Court of India has ruled in favour of residents of four Odisha villages (Tumulia, Jhupuranga, Ratansara and Kirpsara) whose land had been acquired by Mahanadi Coalfields Ltd (MCL) in 1988.

- The landowners will be given compensation per the Rehabilitation and Resettlement Act, 2013 (which replaced the old Land Acquisition Act, 1894)
- This is the first time the State has been obligated to ensure that resettlement and rehabilitation were provided in addition to compensation.
- Compensation by MCL includes developing housing plots, one-time cash settlements of Rs 25 lakh and to provide employment to two members of the displaced families with other monetary and tangible benefits.

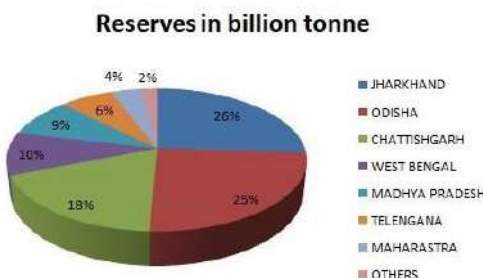
About Mahanadi:

- It is a major river in East Central India.
- It arises from Raipur district of Chhattisgarh and flows for about 851 km through the states of Chhattisgarh and Odisha and finally merged with Bay of Bengal.
- Its tributaries include Seonath, the Jonk, the Hasdeo, the Mand, the Ib, the Ong and the Tel.
- Hirakud Dam is located on the river.



About Coal reserves in India:

- India ranks 5th in terms of coal reserves in the world.
- A total of 326.49 Billion tonnes of reserves estimated as in 2019 by Geological Survey of India.



- India has 50 Gondwana coalfields (250 mn years old) and 18 Tertiary coalfields (15-60 mn years old).
- Gondwana coal fields make up 98% of the total coal reserves and 99% of total coal production in India.
- Talcher coalfield, Odisha, is having the pride of highest geological reserve of 51.220 BT in the country.

Distribution of coal in India is as follows:



Jharkhand coal fields are as follows:

About Mahanadi Coalfields Limited (MCL):

- It is one of the eight subsidiaries of Coal India Limited.
- It was carved out of South Eastern Coalfields Limited in 1992 with its headquarters at Sambalpur.
- In 2019, it got Miniratna status.
- Joint Ventures of MCL include Mahanadi Basin Power Limited (SPV), MJSJ Coal Limited, MNH Shakti Limited, Mahanadi Coal Railway Limited.

Battle of Rezang La

Context: November 18, 2022, marks the 60th anniversary of the Battle of Rezang La, one of the few bright spots in the War of 1962 with China.

About Rezang La:

- It is also called Rechin La.
- It is a mountain pass on the Line of Actual Control between Indian-administered Ladakh and the Chinese-administered Spanggur Lake basin that is also claimed by India.
- The pass is located on the eastern watershed ridge of the Chushul Valley that China claims as its boundary.
- It is at the head of the Rezang Lungpa valley, which houses a stream draining into the Spanggur Lake.

About the war memorial:



- It is dedicated to those who laid down their lives in the Battle of Rezang La during the 1962 war.
- It will now include the names of Army personnel who lost their lives in the violent clash at Galwan last year.
- 18th November marks the 60th anniversary of the Battle of Rezang La in which Troops from the 13 Kumaon Regiment defeated several waves of

the Chinese Army at a height of over 16,000 feet.

Post 120 Memorial:

- In October 2020, the Army had built a memorial at Post 120 in Eastern Ladakh for the 20 personnel killed in the violent clash at Galwan Valley on June 15 that year.

Kosasthalaiyar river & Ennore Creek

- Post 120 lies along the Darbuk Shyok-Daulat Beg Oldi (DBO)

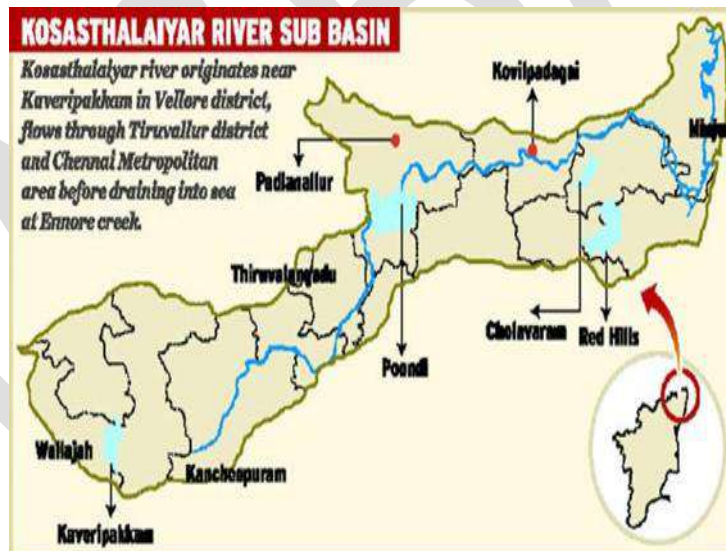
In News: The Water Resources Department has called for tenders to build a training wall at the mouth of Ennore creek to prevent sand deposit and flooding along the Kosasthalaiyar river, based on the recommendations of the National Institute of Ocean Technology (NIOT).

About the project:

- Training walls are a collection of boulders.
- While they are like groynes, the training walls would prevent sedimentation and flooding near the creek.
- The structure would divert the silt towards the ocean side and enable the mouth to be open.
- The training wall would provide better access to small fishing boats and also shelter them in the creek during storms, in the Ennore Creek.

About Kosasthalaiyar river:

- Kosasthalaiyar river or Kortalaiyar, is one of the three rivers that flow in the Chennai metropolitan area.
- the Kosasthalaiyar to the north
- the Adyar river to the south
- the Cooum flowing between them across central Chennai
- It originates near Pallipattu in Thiruvallur district and drains into the Bay of Bengal.
- Its catchment area is spread over Vellore, Chittoor, North Arcot, Thiruvallur and Chennai districts.
- Tributaries: Nagari river (north)
- From Poondi reservoir, the river flows through Thiruvallur District, enters the Chennai metropolitan area, and joins the sea at Ennore Creek.

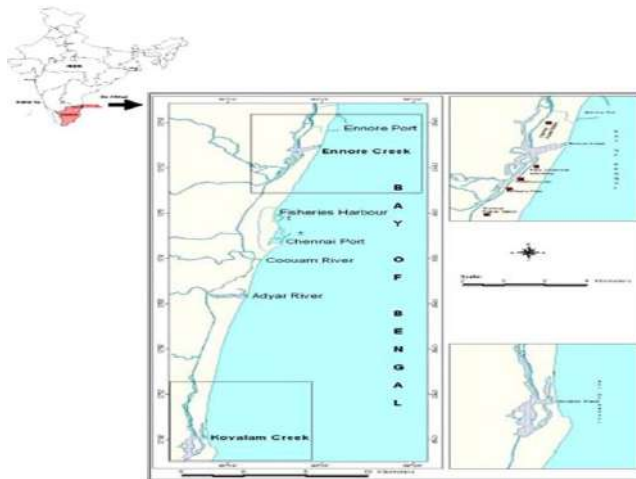


Source: Water Resources Department

Ennore Creek:

- Ennore Creek is a backwater located in Chennai along the Coromandel Coast of the Bay of Bengal.
- It is in the zone comprising lagoons with salt marshes and backwaters, submerged under water during high tide and forming an arm of the sea with the opening to the Bay of Bengal at the creek.

- The creek sustains the livelihood of the fisherfolk families in many neighbouring villages.
- Kosasthalaiyar river had a maximum flood discharge capacity of nearly 1.25 lakh cusecs (cubic feet per second) near the creek.
- As the creek's mouth was open for a width of up to 80 metres, areas upstream of the Kosasthalaiyar river, including Manali New Town, were inundated whenever the river had a peak flow.



National Institute of Ocean Technology (NIOT):

- Established in 1993 as an autonomous society under the Ministry of Earth Sciences in India.
- NIOT is managed by a Governing Council and is headed by a director.
- It is based in Chennai.
- The major aim is to develop reliable indigenous technologies to solve various engineering problems associated with harvesting of non-living and living resources in India’s exclusive economic

zone, which is about two-thirds of the land area of India.

New species of black corals

Context: Recently Scientists discovered five new species of black corals living as deep as 2,500 feet (760 meters) below the surface in the Great Barrier Reef and Coral Sea off the coast of Australia by using a remote-controlled submarine.

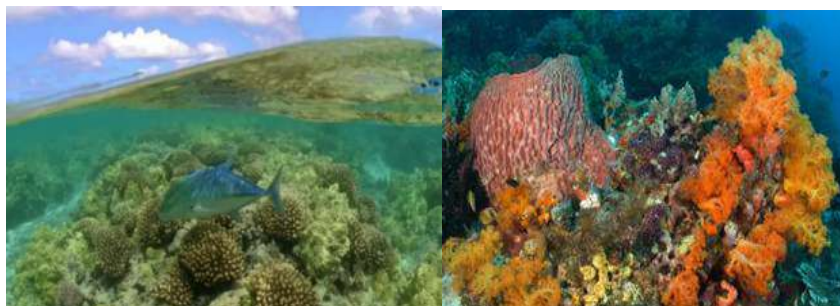
About black corals:

- Black corals or antipatharians are colonial animals which are related to sea anemones and stony corals.
- They are named for the colour of their stiff, black or brownish skeleton.
- More than 150 species of black corals have been described. At least 14 species of black corals are currently known from Hawai’i.
- Distribution: Black corals are found in all oceans, but are most common in deep water habitats of tropical and subtropical seas.
- Black corals are carnivores.
- Black corals can be found growing both in shallow waters and down to depths of over 26,000 feet (8,000 meters), and some individual corals can live for over 4,000 years.
- Black corals are filter feeders and eat tiny zooplankton that are abundant in deep waters.
- While colourful shallow-water corals rely on the sun and photosynthesis for energy.



About Corals:

- Coral reefs are the most diverse of all marine ecosystems. They teem with life, with perhaps one-quarter of all ocean species depending on reefs for food and shelter.
- Because they are so diverse, coral reefs are often called the rainforests of the sea.



- Shallow water corals that live in warm water often have another source of food, the zooxanthellae (pronounced zo-o-zan-THELL-ee).
- These single-celled algae photosynthesize and pass some of the food they make from the sun's energy to their hosts, and in exchange the coral animal gives nutrients to the algae.
- The zooxanthellae also provide much of the green, brown, and reddish colours that corals have.

Coral Diversity:

- In the so-called true stony corals, which compose most tropical reefs, each polyp sits in a cup made of calcium carbonate.
- Stony corals are the most important reef builders, but organpipe corals, precious red corals, and blue corals also have stony skeletons.
- There are also corals that use more flexible materials or tiny stiff rods to build their skeletons—the seafans and sea rods, the rubbery soft corals, and the black corals.
- The fire corals (named for their strong sting) are anthozoans, which are divided into two main groups.
- The hexacorals have smooth tentacles, often in multiples of six, and the octocorals have eight tentacles, each of which has tiny branches running along the sides. All corals are in the phylum Cnidaria, the same as jellyfish.

Reproduction:

- Corals have multiple reproductive strategies – they can be male or female or both, and can reproduce either asexually or sexually.
- Asexual reproduction is important for increasing the size of the colony, and sexual reproduction increases genetic diversity and starts new colonies that can be far from the parents.

Coral distribution across the world:

- Corals are found across the world's ocean, in both shallow and deep water, but reef-building corals are only found in shallow tropical and subtropical waters.
- This is because the algae found in their tissues need light for photosynthesis and they prefer water temperatures between 70-85°F (22-29°C).
- There are also deep-sea corals that thrive in cold, dark water at depths of up to 20,000 feet (6,000 m).
- Both stony corals and soft corals can be found in the deep sea.
- Deep-sea corals do not have the same algae and do not need sunlight or warm water to survive, but they also grow very slowly. One place to find them is on underwater peaks called seamounts.

Australia's Great Barrier Reef (GBR)

- The reef is located in the Coral Sea, off the coast of Queensland, Australia.

- This reef was selected as a World Heritage Site in 1981.
- A large part of the reef is protected by the Great Barrier Reef Marine Park.

Threats:

- Ocean Acidification
- Overfishing and overharvesting of corals
- coral bleaching
- Sunscreen chemicals
- Many corals are threatened by illegal harvesting for jewellery.

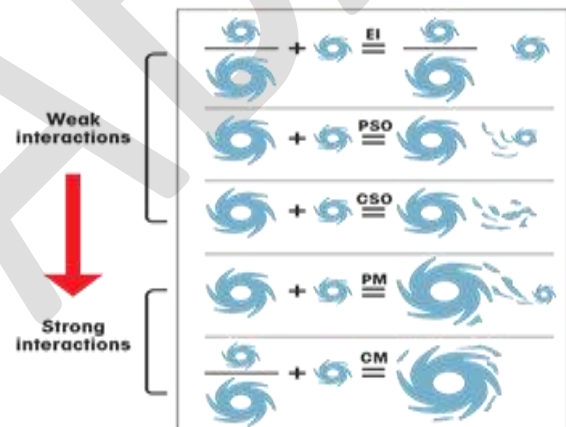


Fujiwhara Effect

In News: On September 1, 2022, super typhoon Hinnamnor, the strongest tropical cyclone of the year, was hurtling towards Taiwan from the western Pacific Ocean and another tropical storm called Gardo was moving towards Hinnamnor from its southeast and as they approached each other, they showed a textbook example of what is known as the Fujiwhara Effect.

About Fujiwhara effect:

- It refers to any interaction between tropical storms formed around the same time in the same ocean region with their centres or eyes at less than 1,400 km, with intensity that could vary between a depression (wind speed under 63 km per hour) and a super typhoon (wind speed over 209 km per hour).
- The interaction could lead to changes in the track and intensity of either or both storms systems.
- In rare cases, the two systems could merge, especially when they are of similar size and intensity, to form a bigger storm.
- There are five different ways in which Fujiwhara Effect can take place.
- Elastic interaction in which only the direction of motion of the storms changes and is the most common case but difficult to assess and need closer examination.
- Partial straining out in which a part of the smaller storm is lost to the atmosphere.
- Complete straining out in which the smaller storm is completely lost to the atmosphere. The straining out does not happen for storms of equal strengths.
- Partial merger in which the smaller storm merges into the bigger one
- Complete merger which takes places between two storms of similar strength.
- During a merger interaction between two tropical cyclones the wind circulations come together and form a sort of whirlpool of winds in the atmosphere.
- Fujiwhara effect was identified by Sakuhei Fujiwhara, a Japanese meteorologist in 1921.



Elastic Interaction (EI): Interaction of vortices (storms) of same or different sizes, resulting in changes only in the direction of motion. This is the most commonly seen interaction

Partial Straining-Out (PSO): Interaction of vortices of unequal sizes. Part of the smaller vortex lost to the atmosphere.

Complete Straining-Out (CSO): Interaction of vortices of unequal sizes. The smaller vortex completely lost to the atmosphere

Partial Merger (PM): Interaction of vortices of unequal sizes Part of the smaller vortex merged to the bigger vortex

Complete Merger (CM): Interaction of vortices of same or different sizes, resulting in complete merger of both the storms

- The first known instance of the effect was in 1964 in the western Pacific Ocean when typhoons Marie and Kathy merged.

Effect:

- It makes cyclones more unpredictable due to their rapid intensification, carrying of more rain and newer ways of moving over warming oceans.
- This is because each of the interactions between the two storm systems is unique and very difficult to capture with current climate models.
- This may result in large-scale devastation.
- In an increasingly warming world, a dance and merger between two large enough tropical cyclones over any of the global oceans could lead to the formation of a mega cyclone, causing devastation along coast-lines.

Examples:

- In April 2021, in Indian Ocean, cyclone Seroja interacted with cyclone Odette just off the coast of western Australia.
- Seroja became a unique storm because the north western coast of Australia is prone to cyclones while the southwestern part hit by the cyclone does not get much storm activity.

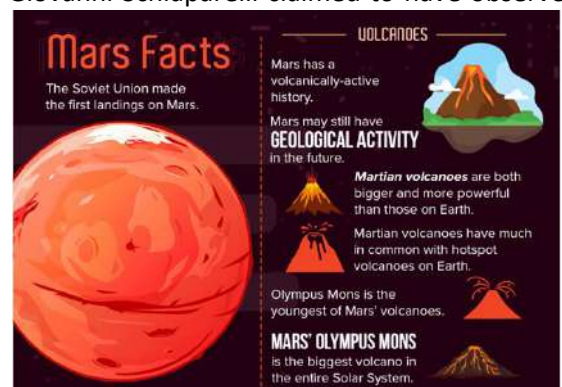
Red planet day

In news: Commemorating the day one of the most significant space missions to Mars was launched, November 28 is marked as Red Planet Day.

- On this day in 1964, the United States launched the space probe Mariner 4 on a course towards Mars, which it flew past in July 1965, sending back pictures of the red planet.
- This was the first time that a spacecraft undertook the first flyby of the red planet, becoming the first-ever spacecraft to take close-up photographs of another planet.

About Mars:

- Mars has two moons Phobos and Deimos
- In late 19th century, Italian astronomer Giovanni Schiaparelli claimed to have observed linear patterns on the surface of the planet that he called Canali.
- This was mistranslated into English as canals, leading some to believe canals were built by intelligent beings on Mars — an early instance of Mars being thought to have life, similar to Earth.
- 1964 Mariner 4 showed lunar-type impact craters, some of them having frost.
- A television camera took pictures of about 1% of the planet.
- Mariner 4 lasts about three years in solar orbit
- Viking missions of the 1970s and the 1980s carried out the first chemical analysis of Martian soil, as well as four biology experiments to detect biological activity.
- Scientists hypothesised that certain meteorites might have a source region in Mars.
- In 1984, a study showed that the isotopic composition of rare gases (Xenon, Krypton, Neon and Argon) matched the isotopic ratios of the Martian atmosphere measured by the Viking spacecraft.
- Odyssey, 2001 and water on Mars: Gamma Ray Spectrometer on board the Mars Odyssey spacecraft detected a fascinating hydrogen signature that seemed to indicate the

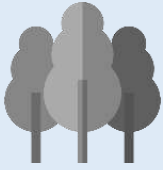


presence of water ice. But there was ambiguity – this was because hydrogen can be part of many other compounds as well.

- NASA's Phoenix landed on the Martian North Pole in May 2008, and survived for about 150 days.
- The robotic arms of Phoenix scooped soil and ice from the surface, heated the material in eight ovens, and measured the composition of the gases with a mass spectrometer.
- The Phoenix mission established conclusively that the initial discovery of hydrogen by Mars Odyssey in 2002 was indeed water ice.

Mars missions:

- NASA has a lander (Mars Insight), a rover (Curiosity), and three orbiters (Mars Reconnaissance Orbiter, Mars Odyssey, MAVEN)
- India's Mars Orbiter Mission (Mangalyaan-1)
- A technology demonstration venture — carried five payloads (total 15 kg) collecting data on surface geology, morphology, atmospheric processes, surface temperature and atmospheric escape process.
- UAE – Hope
- study the Martian atmosphere
- address question of how and why Mars lost its atmosphere
- EU has 2 orbiters (Mars Express and ExoMars Trace Gas Orbiter)
- China – Tianwen-1



ENVIRONMENT



Invasive Species

In News: An invasive species, *Senna spectabilis*, an exotic tree, has taken over between 800 and 1,200 hectares of the buffer zones of the Mudumalai Tiger Reserve (MTR) especially the Singara and Masinagudi forest ranges, as well as in Kargudi range in the core area of the reserve.

About:

- Introduced as an ornamental species and for use as firewood from South and Central America or for paper-making, the species has become highly invasive in the Sigur plateau in both the core and buffer zones of the MTR.
- It has bright yellow flowers and has a negative effect on local biodiversity, crowding out native species and limiting food availability for wildlife.
- Forest Department is formulating a 10-year-plan to systematically remove *Lantana camara*, the other major weed that poses a threat to biodiversity in both the core and buffer zones of the Tiger Reserve.



Major invasive species of Nilgiris are: *Senna spectabilis*, *Lantana camara*, wattle, Eucalyptus, Pine

- Eucalyptus and Pine, though exotic, do not spread as quickly as the other species and are considered easier to manage
- Funds raised from the removal of the species will be used in eco-restoration to help bring back native species.

Invasive species:

- Invasive alien species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health.
- They regenerate at an alarming speed and threaten to edge out the indigenous flora

Concerns:

- The thick foliage arrests the growth of other indigenous species of trees and grass, and causes food shortage for the wildlife population, especially herbivores, during summer.
- Moreover, wildlife would not feed on the leaves of the tree as it was not palatable for them
- Some of the invasive plants have a toxic impact on the landscape after remaining underwater.
- Some weeds have herbal properties, but their toxicity outweighs their utility. For instance, wild boars love to gorge on the succulent rootlets of the *Leea macrophylla* or 'kukura thengia' that is fast clogging the patrolling paths and grasslands.

Examples of Invasive Animal species: Indian Bullfrog – Andaman and Nicobar, Papaya Mealy Bug – Assam, Amazon sailfin catfish – West Bengal, Cannibal Snail / Rosy wolf snail – Indian Ocean and African apple snail – Andaman and Nicobar

Examples of Invasive species:

- Ipomoea (Ipomoea carnea)
- Mimosa (Mimosa himalaica)
- Parthenium (Parthenium hysterophorus) is believed to have come to India as contaminants in a consignment of wheat imported from the U.S. in the 1950s
- Lantana (Lantana camara) was brought by the British as ornamental plants from South America two centuries ago.
- Bombax ceiba (locally called Semul)
- Largetstroemia speciosa (locally called ejhar)
- Cestrum diurnum or day-blooming jasmine of West Indies origin; otherwise, a source of vitamin D3. Once the modalities are finalised, this weed can be turned into a commercial crop for the people in the vicinity of Kaziranga. Pharmaceutical companies need tonnes of dry leaves of this plant periodically
- Cane is a commercial plant that is threatening to be an invasive plant in Kaziranga.

Mudumalai Tiger Reserve (MTR):

- Mudumalai Tiger Reserve is located in the Nilgiris District of Tamil Nadu state at the tri-junction of three states, viz, Karnataka, Kerala and Tamil Nadu.
- It is a part of Nilgiri Biosphere Reserve (1st Biosphere Reserve in India) along with
- Wayanad Wildlife Sanctuary (Kerala) in the West
- Bandipur National Park (Karnataka) in the North
- Mukurthi National Park
- Silent Valley in the South.
- **Flora:** The Reserve has tall grasses, commonly referred to as ‘Elephant Grass’.
- Bamboo of the giant variety, valuable timber species like Teak, Rosewood, etc.
- There are several species of endemic flora.
- **Fauna:** Flagship Species: Tiger and Asian Elephant.



Other Tiger Reserves in Tamil Nadu

- Anamalai Tiger Reserve (ATR)
- Kalakad Mundanthurai Tiger Reserve (KMTR)
- Sathyamangalam Tiger Reserve (STR)

Rhinos

In news: According to a recent study, published in the latest edition of People and Nature by the British Ecological Society, which used an interesting research approach—analysing artwork and photographs of the animal spanning more than five centuries.

- It relied on a repository of images maintained by the Netherlands-based Rhino Research Centre (RRC).

About Rhinos:

- Rhinos have long been hunted for their horns, which are highly valued in some cultures.
- The five surviving rhino species (Black and White African rhino, Asian rhino species – greater one horned, Sumatran and Javan rhinos) are still threatened by habitat loss and hunting.

IUCN Status:

- Greater one horned Rhino: Vulnerable
- Sumatran Rhino: Critically Endangered
- Javan Rhino: Vulnerable
- Black African Rhino: Critically Endangered
- White African Rhino: Near Threatened

Greater One-Horned Rhinoceros:

- Also known as Indian rhino, it is the largest of the rhino species.
- India is home to the largest number of Greater One-Horned Rhinoceros in the world.
- At present, there are about 2,600 Indian rhinos in India, with more than 90% of the population concentrated in Assam’s Kaziranga National Park.



Habitat:

- The species is restricted to small habitats in Indo-Nepal terai and northern West Bengal and Assam.
- In India, rhinos are mainly found in Kaziranga NP, Pobitora WLS, Orang NP, Manas NP in Assam, Jaldapara NP and Gorumara NP in West Bengal
- Dudhwa TR in Uttar Pradesh.

Threats:

- Poaching for the horns
- Habitat loss
- Population density
- Decreasing Genetic diversity

Protection Status:

- IUCN Red List: Vulnerable.
- CITES: Appendix-I
- Wildlife Protection Act, 1972: Schedule I.

Pangolins

Context: During recently concluded the 19th Conference of Parties (COP19) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) urged countries, to remove references to parts and derivatives of pangolins “from the official pharmacopoeia” to help save the species.

About Pangolins:

- Scientific Name: Manis crassicaudata
- The Indian pangolin is the largest among eight pangolin species.
- Of the eight species of pangolin worldwide, two are found in India. They are Chinese pangolin (manis pentadactyla), mostly found in northeast India and Indian pangolin (Manis crassicaudata).



Animal Description:

- It has large, overlapping scales on its body that act as armour.
- It can also curl itself into a ball (volvation) as self-defence against predators such as the tiger.

- The nocturnal animal lives in burrows and feed on ants and termites.

Habitat and Distribution:

- The species is understood to occur in various types of tropical forests as well as open land, grasslands and degraded habitats, including close to villages.
- The species can adapt well to modified habitats, provided its ant and termite prey remains abundant
- It is widely distributed in India, except in the arid region, high Himalayas and the North-East.
- It can be found at elevations up to 2500 m. The species also occurs in Bangladesh, Pakistan, Nepal and Sri Lanka.

Threats:

- Poaching for its meat and scales, which are used and consumed by local people, but are also increasingly traded internationally.
- The scales serves as base component for indigenous (traditional) psychotropic substances.
- China is main illicit hub (market) for smuggled scales of Pangolins, where they have huge demand for medicinal and magical purposes.

Protection status: Indian Pangolins

- **Schedule I under Wildlife (Protection) Act, 1972.**
- **Appendix I of the International Convention of Trade in Endangered Species (CITES).**
- **Endangered in IUCN Red List.**
- **Chinese pangolin** has been listed as “critically endangered” by UN affiliated International Union for Conservation of Nature’s (IUCN) Red List.

About CITES:

- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as the Washington Convention) is a multilateral treaty to protect endangered plants and animals from the threats of international trade.
- It was drafted as a result of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature (IUCN).
- AIM: Its aim is to ensure that international trade (import/export) in specimens of animals and plants included under CITES, does not threaten the survival of the species in the wild.
- Although CITES is legally binding on the Parties it does not take the place of national laws.
- Rather it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.

Nagaland’s Bird Count drive

In News: A recent 4-day birding drive called Tokhü Emong Bird Count (TEBC), was organised in Nagaland during Tokhü Emong post-harvest festival of the Lotha Nagas.

- Birding is a unique enterprise in which birdwatchers contribute crucial information on the behaviour, distribution, and occurrence of bird species to ornithological knowledge.

About the event:

- Organised in collaboration with the Wokha Forest Division, Nagaland Forest Management Project, Wokha, Nagaland and Bird Count India.
- Aim: To get people interested in birds, create awareness, celebrate the rich bird diversity of the state and set a benchmark against which future studies of avian populations can be compared.
- This initiative involves local communities to identify different species that are found in the state.
- It has documented a total of 178 bird species in the state.

- eBird is an online platform to record their observations.
- Nagaland is known as the “Falcon Capital of the World”.

Species reported included:**Brown Shrike**

- Warblers — Ashy-throated, Buff-barred, Yellow-browed, Dusky, Grey-cheeked, Greenish, and Yellow-bellied Warblers, Whistler’s, Blyth’s Leaf, Grey-hooded, Brown Bush, and Brownish-flanked Bush Warbler.

Spot-breasted Parrotbill

- Partridge — Hill, Rufous-throated, and Mountain Bamboo-Partridge.
- Raptors included Eurasian Sparrowhawk, Himalayan Buzzard, Oriental Scops-Owl and Amur Falcon.
- Asian Barred and Collared Owlet
- Scops-Owl — Mountain Scops-Owl, Collared Scops-Owl and Oriental Scops-Owl

Black-tailed Crane.

- Bulbul — Black-crested, Crested Finchbill, Striated, Red-vented, Red-whiskered, Flavescent, Himalayan Black, Mountain Bulbul;
- Thrush — Long-billed, Black-breasted, Eyebrowed, Blue Whistling-Thrush
- Wagtail — Grey, Eastern Yellow, and White Wagtail.

About Bird Count India:

- Bird Count India is an informal partnership of organizations and groups working together to increase our collective knowledge about bird distributions and populations.
- The eBird India portal is managed by Bird Count India.

Gangetic Dolphins

In News: Dolphins have started coming back to the Ganga River with improvement in the quality of its water through the Namami Gange programme, said the Uttar Pradesh government.

- With the completion of 23 projects under the ambitious programme started in 2014, the State has successfully stopped flowing of more than 460 MLD of sewage into the Ganga in the State.

About:

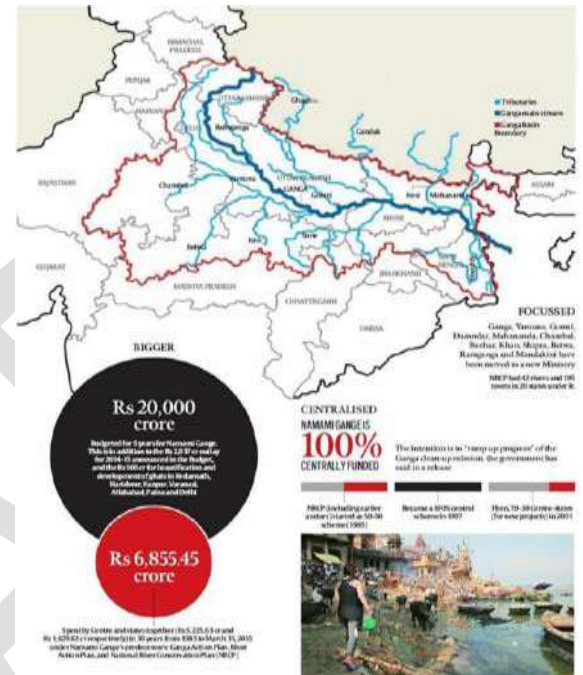
- Dolphins have also been seen breeding in Brijghat, Narora, Kanpur, Mirzapur and Varanasi, which is likely to increase their number further in the coming days.
- At present, the population of dolphins in Ganga in Uttar Pradesh is estimated to be around 600.
- There has been a lot of improvement in dissolved oxygen (DO), biochemical demand (BOD) and faecal coliform (FC) parameters as well,
- As per the assessment of river water quality, pH (how acidic the water was) at 20 locations met the water quality criteria for bathing.

The Namami Ganga programme:

- It was launched in 2014 with the objective to rejuvenate Ganga by adopting an integrated approach which focused on the interception and diversion of sewage by tapping the drains flowing into the river Ganga.
- Under the aegis of National Mission for Clean Ganga (NMCG) & State Program Management Groups (SPMGs) States and Urban Local Bodies and Panchayati Raj institutions will be involved in this project.
- Chacha Chaudhary is the declared Mascot.

NEED:

- Rising in the Himalayas and flowing to the Bay of Bengal, the river traverses a course of more than 2,500 km through the plains of north and eastern India.
- The Ganga basin – which also extends into parts of Nepal, China and Bangladesh – accounts for 26 per cent of India’s landmass.
- The Ganga also serves as one of India’s holiest rivers whose cultural and spiritual significance transcends the boundaries of the basin.
- Rapidly increasing population, rising standards of living and exponential growth of industrialization and urbanization have exposed water resources to various forms of degradation.
- The deterioration in the water quality of Ganga impacts the people immediately.
- Major components of the project will be Wetland inventory and assessment, Wetland management planning, Wetland’s monitoring, and Capacity development and outreach.
- Aims at creating a knowledge base and capacities for effective management of floodplain wetlands in the 12 Ganga districts in Bihar to ensure sustained provision of wetlands ecosystem services and securing biodiversity habitats.



Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

Context: Indian Veterinary Research Institute (IVRI) has demanded a ban on using aceclofenac in cattle after a new study showed that the drug metabolises into diclofenac in water buffaloes — as it does in cows.

NSAIDs as a major threat to vultures in India:

- The rampant use of the three non-steroidal anti-inflammatory drugs (NSAIDs) threatens to undo the Centre’s two decades of work to arrest the dwindling vulture population in the wild.
- The three drugs—aceclofenac, ketoprofen and nimesulide—were introduced as alternatives to diclofenac, that India banned in 2006 for animal use because it caused widespread vulture deaths.
- The country’s vulture population crashed from over 40,000 in 2003 to 18,645 in 2015, as per the last vulture census conducted by intergovernmental body Bird Life International.
- India’s vulture conservation action plan for 2020-25 recommends a ban on the veterinary use of the three drugs.
- India is also a signatory to the Convention on Migratory Species’ Multi-species Action Plan to Conserve African-Eurasian Vultures, which recognises NSAIDs as a major threat to vultures in India.
- The vulture action plan recommends meloxicam over diclofenac. Tolfenamic acid is the other safe option.

About Aceclofenac:

- It is used for the relief of pain and inflammation in rheumatoid arthritis, osteoarthritis and ankylosing spondylitis.
- IVRI and its collaborators conducted the study and found that aceclofenac was rapidly converted to diclofenac while injecting the same water buffaloes.
- Such metabolisms pose a threat to vulture populations in the country.

Diclofenac :

- Anti-inflammatory drug was banned for veterinary use by the Government of India in 2006.
- It was found to be the main cause of a dramatic decline (99 per cent) of the vulture population across Asia.
- The drug caused accidental poisoning in raptors after they fed on carcasses of cattle injected with it.
- Aceclofenac in water buffaloes poses the same threat to vultures as it is a pro-drug of diclofenac.
- Vulture Action Plan 2020-2025 also mentions the drug as toxic, asking the Drugs Controller General of India (DGCI) to ban its veterinary use — along with other drugs like nimesulide and ketoprofen.

MUST READ: [Vulture Conservation in India](#)
Apis karinjodian

In news: A new species of endemic honeybee has been discovered after a gap of more than 200 years. The new species has been named *Apis karinjodian* and given the common name Indian black honeybee.

- The new find has increased the species of honeybees in the world to 11.
- Molecular analysis of mitochondrial DNA was also carried out and molecular sequence data available in the public open database NCBI-GenBank also helped confirm the species status of the new honeybee.

About:

- The Indian black honeybee, ranges from the central Western Ghats and Nilgiris to the southern Western Ghats, covering the States of Goa, Karnataka, Kerala and parts of Tamil Nadu.
- The last honeybee described from India was *Apis indica* in 1798 by Fabricius. It was not considered a valid species till now.
- The research team restored the status of *Apis indica* based on a new measure for species discrimination in honeybees termed 'Radio-Medial Index (RMI)'.
 • *Apis karinjodian* has evolved from *Apis cerana* morphotypes that got acclimatised to the hot and humid environment of the Western Ghats.
- Till date, only a single species, *Apis cerana* was noted across the plains of central and southern India and Sri Lanka as a 'fairly uniform population' in the Indian subcontinent.
- IUCN status: near threatened

Significance:

- The research has given a new direction to apiculture in the country by proving that it has three species of cavity nesting honey bees viz., *Apis indica*, *Apis cerana*, and *Apis karinjodian*, the last being visibly dark in appearance.
- The ability of the Indian black honeybee to produce higher quantities of honey, which is thicker in consistency, opens up new avenues for increasing honey production.

COP14 of Ramsar Convention on Wetlands

In news: The 14th Meeting of the Conference of the Contracting Parties (COP14) to the Ramsar Convention on Wetlands began to discuss the state of wetlands globally.

Mangroves in China:

- China Mangrove Conservation and Restoration Strategy Research Project in 2020 was China's first research report to comprehensively assess the state of mangroves in the country.
- Mangrove forests in China are growing in the northern edge of the global mangrove distribution. Limited by the low temperature, China has less mangrove species compared with other Southeast Asian countries.
- Mangroves in China were distributed in the provinces of Hainan, Guangdong, Guangxi, Fujian, Zhejiang, as well as Hong Kong, Macao and Taiwan. All these areas are located in the extreme tropical south of the country.
- Mangrove area in China had decreased sharply to 22,000 hectares in 2000, only 45 per cent that of the early 1950s.

About Mangroves:

- Mangroves are a group of halophyte trees and shrubs that live in the coastal intertidal zone, in dense thickets or forests along tidal estuaries, in salt marshes, and on muddy coasts – they can tolerate salt.
- Mangroves are typically tropical in nature than temperate because they cannot withstand freezing temperatures. Indonesia alone contains between 26% and 29% of the entire global mangrove stock.
- These trees grow in areas with low-oxygen soil, where slow-moving waters allow fine sediments to accumulate.
- They have a dense tangle of prop roots —i.e., exposed supporting roots that make the trees appear to be standing on stilts above the water. This intricate root system:-
- allows the trees to handle the daily rise and fall of tides, which means that most mangroves get flooded at least twice per day.
- Filter salt out of sea water, stay upright in soft, waterlogged soils and give them access to oxygen and nutrients.
- slows the movement of tidal waters, causing sediments to settle out of the water and build up the muddy bottom.
- stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides.
- makes these forests attractive to fish and other organisms seeking food and shelter from predators.
- Its flowers are pale yellow in colour.

Greenwashing

In News: In the first official acknowledgment of 'greenwashing', UN Secretary General warned private corporations to desist from such practices and mend their ways within a year.

About Greenwashing:

- Greenwashing is the process of conveying a false impression or misleading information about how a company's products are environmentally sound.
- Greenwashing involves making an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly or have a greater positive environmental impact than is true.
- Greenwashing may occur when a company attempts to emphasize sustainable aspects of a product to overshadow the company's involvement in environmentally damaging practices.

- Performed through the use of environmental imagery, misleading labels, and hiding trade-offs, greenwashing is a play on the term “whitewashing,” which means using false information to intentionally hide wrongdoing, error, or an unpleasant situation in an attempt to make it seem less bad than it is.
- There is a growing tendency among firms and governments to mark all kinds of activities as climate-friendly.
- Many of these claims are unverifiable, misleading, or dubious. While they help in boosting the image of the entity, sometimes even helping them garner benefits, they do nothing in the fight against climate change.

Greenwashing – Example

- A classic example of greenwashing is when Volkswagen admitted to cheating emissions tests by fitting various vehicles with a “defect” device, with software that could detect when it was undergoing an emissions test and altering the performance to reduce the emissions level.
- This was going on while to the public the company was touting the low-emissions and eco-friendly features of its vehicles in marketing campaigns. In actuality, these engines were emitting up to 40 times the allowed limit for nitrogen oxide pollutants.

Effects of greenwashing:

- Greenwashing has numerous effects on consumers, companies, green industries and the planet itself.
- For consumers – there is a growing body of evidence that shows consumer sentiment is slanted toward being green and environmentally sustainable.
- When a company, product or service is caught or discovered to be greenwashing, there is a general sense of distrust that occurs. Consumers will no longer trust the brand or product in question, and might also begin to question other claims.
- For companies engaged in greenwashing – consumers will likely choose other organizations that are more ethical.
- Greenwashing can degrade customer satisfaction, erode brand loyalty and potentially affect repeat purchases.
- Companies also run the risk of fines from government and regulatory agencies around the world.
- For green industries – the risk of greenwashing is a lack of trust from consumers. If there is a lot of greenwashing, then consumers will simply not trust green claims from anyone – including legitimately green industries – as they will not know whom to trust.

On Planet – Ultimately, the biggest effect of greenwashing is existential.

- Each act that an organization or individual doesn’t take with real green initiatives has a potential negative effect on the planet.
- With the effects of climate change continuing to manifest on humanity, there is no time to waste in taking steps to help improve sustainability such that humanity and Earth itself will continue to survive.

Mangrove Breakthrough

In news: Being launched at COP27 by the Global Mangrove Alliance (GMA) in collaboration with the UN Climate Change High-level Champions as a unified global approach towards mangrove conservation.

About Mangrove Breakthrough (MB):

- The Mangrove Breakthrough is a science-based, measurable, and achievable global initiative that provides a framework for public-private players to join forces through a

coalition and strengthen their actions every year, in every sector and in scaling up investment in mangrove protection and restoration.

- It is built on the Breakthrough Agenda launched at COP26, and the Global Mangrove Alliance
- It is part of a set of Sharm El Sheikh Adaptation Agenda of the Marrakech Partnership Adaptation and Resilience Breakthroughs which collectively define global milestones and high-impact solutions to reduce climate risks, particularly in vulnerable communities, through adaptation action.
- Aim: To catalyse the financial support needed to scale proven solutions by working to channel finance to the ground through the Global Mangrove Alliance.

It aims to secure the future of 15 million hectares of mangroves globally by 2030 through collective action on:

- Halting mangrove losses
- Restoring half of recent mangrove losses
- Doubling the protection of mangroves globally.
- Ensuring sustainable long-term finance for all existing mangroves by achieving an investment of 4 billion USD by 2030
- Current signatories to the breakthrough include Global Mangrove Alliance members, the Ocean Risk and Resilience Action Alliance (ORRAA), and Salesforce, among many others.

Significance of mangroves:

- Critical coastal ecosystems and are proven nature-based solutions to climate change.
- Provide food, extreme weather protection, and livelihoods, while harbouring incredible biodiversity, building coastal resilience, and acting as immense carbon sinks
- Stabilize shorelines and provide fish nurseries throughout tropical and warm temperate coasts.

About The Global Mangrove Alliance(GMA):

- Formed in 2018 by
- Conservation International (CI)
- the International Union for Conservation of Nature (IUCN)
- The Nature Conservancy (TNC)
- Wetlands International
- World Wildlife Fund (WWF)
- This partnership now includes over 30 member organizations
- Aim of scaling up the recovery of mangroves through equitable and effective expansion of both mangrove protection and the restoration of former mangrove areas.
- The GMA works worldwide in supporting research, advocacy, education and practical projects on the ground with local and community partners.
- It is a world-wide collaboration between NGOs, governments, academics and communities working together towards a global vision for accelerating change and building a host of opportunities for coastal peoples and biodiversity around the planet.

Global Mangrove Watch (GMW):

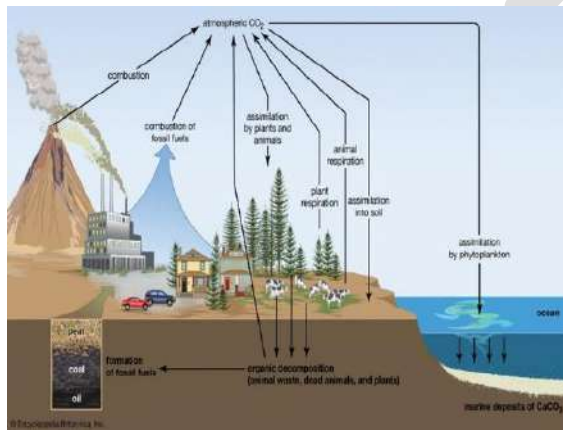
- It is an online platform that provides the remote sensing data and real time information about changes and tools for monitoring mangroves across the world, and highlights why they are valuable.

- Established in 2011 under the Japan Aerospace Exploration Agency's (JAXA) Kyoto & Carbon Initiative by Aberystwyth University, solo Earth Observation and the International Water Management Institute.
- Aims to provide open access geospatial information about mangrove extent and changes to the Ramsar Convention on Wetlands.
- In collaboration with Wetlands International and with support from DOB Ecology, the first GMW baseline maps were released in 2018 at the Ramsar COP13.
- The GMW maps also constitute the official mangrove datasets used by UNEP for reporting on Sustainable Development Goal 6.6.1 (change in the extent of water-related ecosystems over time).

Soil carbon sequestration

In News: International Crops Research Institute for The Semi-Arid Tropics (ICRISAT) has published a modelling study that revealed how the right combination of fertilisers, biochar, and irrigation could potentially increase soil carbon by 300%.

About Carbon sequestration:



- Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide.
- The carbon sequestration increased by more than 300 per cent in combination with fertiliser, biochar, and irrigation.
- Biochar is a charcoal-like substance that burns organic material (biomass) from agricultural and forestry wastes in a controlled process called pyrolysis.
- Biochar has safely reduced

contamination and stored carbon.

- Biochar increased carbon value in the soil by 130-300 per cent over 30 years with little difference in yield.
- Optimal use of fertilizers increased the carbon and output by up to 30 per cent.
- Improved nutrients, crop/variety, landform, minimum tillage and residue addition led to a significant increase in soil carbon.
- Carbon sequestration increased by 100 kg ha per year with the improved practices of landform management, fertilizers and crop varieties over 45 years.

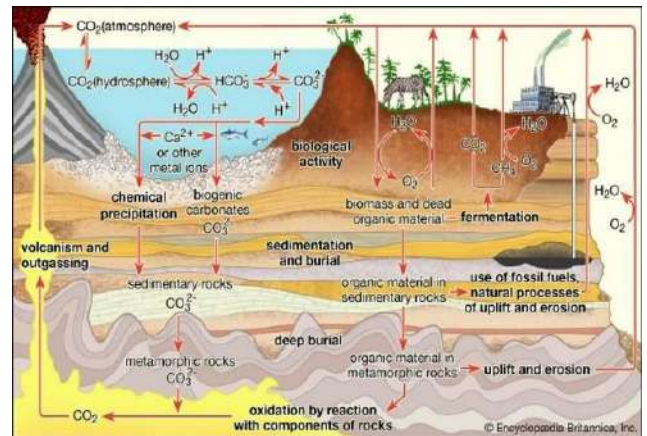
Two major types: geologic and biologic

- Geologic carbon sequestration is the process of storing carbon dioxide (CO2) in underground geologic formations like rocks.
- Biologic carbon sequestration refers to storage of atmospheric carbon in vegetation, soils, woody products, and aquatic environments.
- Carbon sequestration occurs both naturally and as a result of anthropogenic activities.
- The Kyoto Protocol under UNFCCC allows countries to receive credits for their carbon-sequestration activities in the area of land use, land-use change, and forestry.
- Carbon capture and storage (CCS): carbon dioxide is first separated from other gases contained in industrial emissions. It is then compressed and transported to a location that is isolated from the atmosphere for long-term storage.

Carbon cycle is as follows:

Significance:

- Food systems account for nearly one-third of greenhouse gas (GHG) emissions.
- In 2015, food-system emissions amounted to 18 Gt CO₂ equivalent per year globally, representing 34 per cent of total GHG emissions.
- Soil carbon is critical for crop yield and climate adaptation or mitigation measures, which are heavily reduced by both intensive agriculture and indiscriminate use of chemicals leading to increased carbon emissions.
- Carbon sequestering can provide an additional source of income for the farmers.



Methane Alert and Response System (MARS)


In News: The Methane Alert and Response System (MARS) was launched at the 27th Conference of Parties (COP27) to the United Nations Framework Convention on Climate Change in Sharm El-Sheikh, Egypt.

About MARS:

- A new satellite-based system to detect methane emissions and tackle them to slow climate change.
- The data-to-action platform was set up as part of the UN Environment Programme’s (UNEP) International Methane Emissions Observatory (IMEO) strategy to get policy-relevant data into the right hands for emissions mitigation.
- The system will be the first publicly available global system to connect methane detection to notification processes transparently.
- It will use state-of-the-art satellite data to identify significant emission events, notify relevant stakeholders, and support and track mitigation progress.
- MARS partners will also provide technical or advisory services, such as help in assessing mitigation opportunities.
- UNEP will monitor the event location and make the data and analysis available to the public between 45 and 75 days after detection.

About Methane:

- Methane is a short-lived climate pollutant like hydrofluorocarbons and stays in the Earth’s atmosphere for a few years, unlike carbon dioxide.
- Methane is the second-most abundant greenhouse gas in the atmosphere, after carbon dioxide
- Methane is an 80 times more potent greenhouse gas than carbon dioxide at trapping atmospheric heat in the 20 years following its release.
- Methane has contributed to about one-third of the current anthropogenic greenhouse gas-driven warming.
- Major sources of Methane:
 - Natural: decay of plant material in wetlands, termites, oceans, digestion of food by cattle or the seepage of gas from underground deposits.

	<ul style="list-style-type: none"> • Anthropogenic: landfills, oil and natural gas systems, agricultural activities, coal mining, stationary and mobile combustion, wastewater treatment, and industrial processes • India: Agriculture – 61%, Energy sector – 16.4%, waste – 19.8% (as per Global Methane tracker) • Methane enters the atmosphere due to leaks in oil and gas industries, rearing livestock and the decomposition of waste in landfills. • Currently, only 2 per cent of global climate finance goes to methane. • Global methane emissions in 2030, can be reduced by 57 per cent using available strategies and technologies. This reduction can cause lower global warming by around 0.25°C in 2050 and 0.5°C by the end of the century.
<p>Flame Lily</p>	<p>Context: The commercial cultivation of flame lily had attracted many in Tamil Nadu since the 1980s as a kilogram of the seeds of the flower, with its therapeutic properties, fetched up to ₹8,000 in a pharmaceutical-driven market. That’s no longer the case at present.</p> <p>About flame lily:</p>  <ul style="list-style-type: none"> • Flame lily occupies a special place in Tamil literature. • The Sangam-era poet, Kapilar, refers to it in his Kurinchipattu that describes the landscape of the mountainous terrain. • When the State of Tamil Nadu was formed in 1956, flame lily was named as its official flower. • It is also known as: Gloriosa superba/Kanvali kizhangu/Karthigaipoo/Senkanthalpoo • It is commonly found in scrubland, forests, thickets and even sand dunes. • Both the roots and the seeds are important pharmaceutical ingredients in indigenous Indian and African medicine. • They have been part of therapies to treat or manage ailments such as cancer, gout, arthritis, leprosy and dyspepsia.
<p>Climate Change Performance Index (CCPI)</p>	<p>In news: The latest Climate Change Performance Index has put India eighth amongst a group of 59 countries and the European Union (which account for 92% of the total GHG emissions)</p> <ul style="list-style-type: none"> • Denmark and Sweden have been assessed to be the top performers this year as well. • The UK has been ranked 11, Germany 16, while China and the United States are placed at 51st and 52nd ranks respectively (China has dropped 13 places). <p>About CCPI:</p> <ul style="list-style-type: none"> • Published annually since 2005, it tracks countries’ efforts to combat climate change. • Germanwatch, the New Climate Institute and the Climate Action Network publish the index. • It aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries. • The national performances are assessed based on 14 indicators in the following four categories: <ul style="list-style-type: none"> • GHG emissions (weighting 40%) • Renewable energy (weighting 20%) • Energy use (weighting 20%) • Climate policy (weighting 20%) <p>About India’s performance:</p> <ul style="list-style-type: none"> • India moved up two ranks.

- India earns a high rating in the GHG Emissions and Energy Use categories, with a medium for Climate Policy and Renewable Energy.
- The country is on track to meet its 2030 emissions targets (compatible with a well-below 2-degree Celsius scenario). However, the renewable energy pathway is not on track for the 2030 target.
- India’s upgraded NDC (nationally determined contributions)
- net zero target for 2070.
- at least 50 per cent of its electricity generation in 2030 from renewable energy sources (up from 40 per cent earlier)
- cuts in emissions intensity, 45 per cent from 2005 levels by 2030, instead of the 33-35 per cent which was the earlier target.
- India’s climate actions were still not consistent with the 1.5-degree Celsius goal since India has plans to increase its oil and gas production by over 5 per cent by 2030.

Great Knot / Calidris tenuirostris

Context: Unveiling yet another mystery of avian migrations, a great knot from Russia, belonging to the endangered Calidris tenuirostris (Horsfield, 1821), has found its way to Kerala’s coast, flying over 9,000 km for a winter sojourn.

About Great Knot:



- It is a small wader.
- It is the largest of the Calidris species
- It is listed as an ‘endangered’ species by the IUCN.
- It is listed in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals.

Habitat:

- Grassland, Marine Neritic, Marine Intertidal, Marine Coastal/Supratidal.

- This species breeds in northeast Siberia, Russia, wintering mainly in Australia, but also throughout the coastline of South-East Asia and on the coasts of India, Bangladesh, Pakistan, and the eastern coast of the Arabian Peninsula.

Threats:

- Loss of intertidal stopover habitats in the Yellow Sea region is thought to be a key driver in the population declines of shorebirds
- It is also potentially threatened by climate change.
- Recent evidence shows a very rapid population decline caused by the reclamation of non-breeding stopover grounds, and under the assumption that further proposed reclamation projects will cause additional declines in the future.

The Global Snow Leopard Ecosystem Protection Program (GSLEP)

Context: Recently Indian scientists receive international award on behalf of snow leopard conservation alliance.

About the Award:

- The Spain-based BBVA Foundation Awards for Biodiversity Conservation seek to recognise and support the work done by conservationist organisations, institutions and agencies in carrying forward environmental conservation policies and projects.

About The Global Snow Leopard Ecosystem Protection Program (GSLEP):

- The GSLEP is a first-of-its-kind intergovernmental alliance for the conservation of the snow leopard and its unique ecosystem.

- GSLEP was created in 2013 when officials, politicians and conservationists arrived at a common conservation strategy enshrined in the Bishkek Declaration (2013) to cooperate in the conservation of this species and its habitat.
- It is led by the environment ministers of 12 countries in Asia that form the home range of the snow leopard.
- These are Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan.
- The total range spans two million square kilometres.
- The GSLEP Program's secretariat is based in Bishkek, and is hosted by the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic.

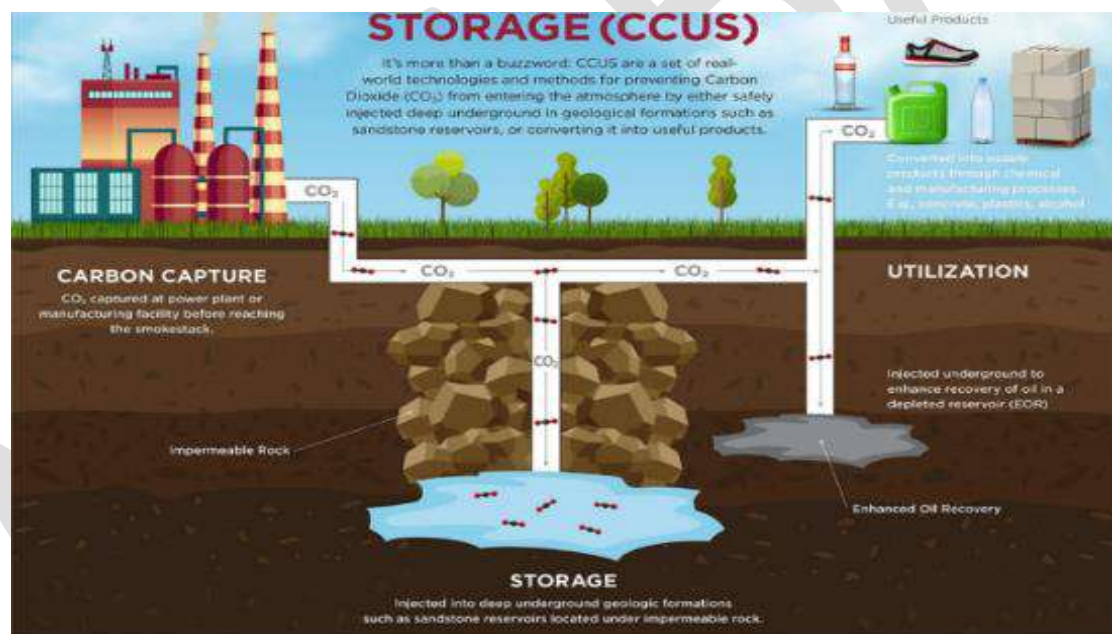
MUST READ: [Snow Leopard and its conservation status](#)

Carbon Capture Utilisation and Storage

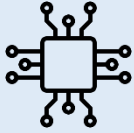
In News: A report on the policy framework of the Carbon Capture Utilisation and Storage or CCUS prepared by the **Niti Aayog and MN Dastur & Company** says CCUS has a critical role to play for the country to halve CO₂ emissions by 2050 and reach net-zero by 2070.

- India's per capita CO₂ emissions were about 1.9 tonnes per annum, which was less than 40% of the global average and about one-fourth of that of China.

About CCUS:



- It is the technology for **decarbonising carbon dioxide (CO₂)** from high polluting sectors such as steel, cement, oil, gas, petrochemicals, chemicals and fertilisers (contribute to 70% of emission).
- The technology would help in promoting the low carbon-hydrogen economy and in removal of the CO₂ stock from the atmosphere.
- It could enable the production of clean products while utilising rich endowments of coal, reducing imports and thus leading to a self-reliant India economy.
- It could enable sunrise sectors such as coal gasification and the nascent hydrogen economy in India.
- Creation of value-added products such as green methanol, green ammonia.
- The key challenge would be to reduce the cost of the mechanisms to implement the technology.
- CCUS sector in India through tax and cash credits and later should transition to carbon taxes.



SCIENCE & TECHNOLOGY



Marie Curie

In News: The 155th birth anniversary of Marie Curie, a name synonymous with one of the earliest examples of women’s successes in STEM (Science, Technology, Engineering and Mathematics), was celebrated.

About Marie Curie:

- Marie Skłodowska Curie was born on November 7, 1867 in in Russia-occupied Poland.
- She got married in 1895 to Pierre Curie.
- Curie’s death in 1934, at age 66, was likely caused by radiation exposure.
- Curie did her thesis on radiation, which was discovered in uranium by Henri Becquerel.

Achievements:

- First individual to win the Nobel Prize twice in two different fields of science – Physics (1903) and Chemistry(1911) and still is the only individual to receive the prize in two different science categories.
- Nobel prize in Physics (1903): Curie became the 1st woman to win Nobel Prize in Physics when she and her husband discovered polonium.
- It was a new element that was 400 times more radioactive than uranium and was added to the Periodic Table in 1898 (named after Curie’s birth country of Poland).
- Nobel prize in Chemistry (1911): Given to Curie in recognition of her services to the advancement of chemistry by the discovery of the elements radium and polonium, by the isolation of radium and the study of the nature and compounds of this remarkable element.
- Curie discovered an even more radioactive element, radium, and made the discovery that radiation was not dependent on the organisation of atoms at the molecular level but the atom itself. The atom was not, as scientists believed at the time, inert, indivisible, or even solid.
- Curie promoted the use of radium to treat diseases and during World War I and personally volunteered for the work.
- Marie became the first woman to teach at Sorbonne University, Paris.
- More substantially, the doors Curie opened have led to significant increases in the number of women involved in STEM, not by one action but simply through pioneering working in the field at a time when women were thought incapable of possessing intellectual capabilities for working in STEM.

PSLV-C54 launch

In news: ISRO successfully placed nine satellites, including an Earth Observation Satellite (EOS-06) in multiple orbits with the help of the space agency’s Polar Satellite Launch Vehicle (PSLV-C54).

- The mission was accomplished from Satish Dhawan Space Centre SHAR.
- This is the 56th flight of the Polar Satellite Launch Vehicle (PSLV) and the 24th flight of the PSLV-XL version with 6 PSOM-Xls.
- The nano satellites include ISRO Nano Satellite-2 for Bhutan (INS-2B), Anand, Astrocast (four satellites), and two Thybolt satellites.

About the satellites:

EOS-6:

- It is the Oceansat series’ third-generation satellite, which provides continued services of Oceansat-2 with enhanced payload capability.

- The satellite onboard carries four payloads.
- It is envisaged to observe ocean colour data, sea surface temperature and wind vector data to use in oceanography, climatic and meteorological applications.
- The satellite also supports value added products such as potential fishing zone using chlorophyll, SST and wind speed, and land based geophysical parameter.
- Astrocast, a 3U spacecraft with 4 Satellites is from Spaceflight Inc, U.S.
- Thybolt is a 0.5U spacecraft bus that includes a communication payload to enable rapid technology demonstration and constellation development for multiple users from Dhruva Space using their own Orbital Deployer with a minimum lifetime of one year.
- The Anand is a three-axis stabilised nano satellite and a technology demonstrator for miniaturised electro-optical payload.
- INS-2B satellite or India-Bhutan satellite has two payloads namely NanoMx, a multispectral optical imaging payload developed by Space Applications Centre (SAC) and APRS-Digipeater, which is jointly developed by DITT-Bhutan and URSC.
- Sub-systems like TTC, power, onboard computer and ADCS from Pixel, India was also placed in the orbit.

Future launches:

- Aditya-L1, a coronagraphy spacecraft to study the solar atmosphere, with a PSLV rocket.

About Polar Satellite Launch Vehicle(PSLV):

- PSLV is known as the ‘workhorse’ of ISRO.
- It is the third generation launch vehicle of India.
- It is a four-staged launch vehicle with first and third stages using solid rocket motors and second and fourth stages using liquid rocket engines.
- It is the first Indian launch vehicle to be equipped with liquid stages.



DNA Sequencing

In news: An international team of scientists have completed the genome sequencing of the wild brown trout — one of the most genetically diverse group of vertebrates.

- It is part of an ambitious project to track the DNA of tens of thousands of lifeforms in the United Kingdom.
- It will answer a long-standing debate about whether they are a single species or several.

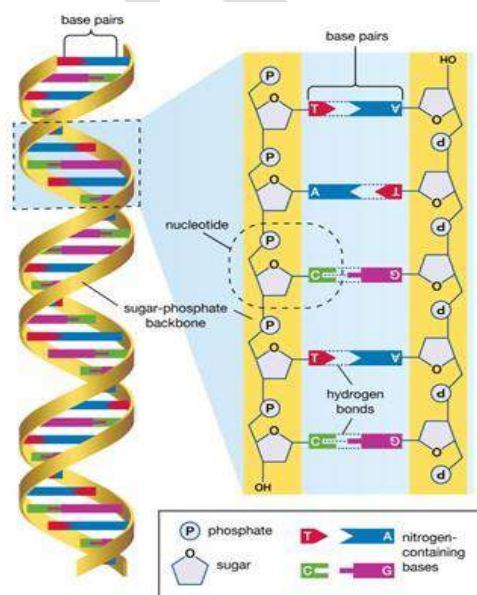
Brown trout:

- Also called, Salmo Trutta, it has only 3 to 50 species.

- It has 38 to 40 chromosomes and multiple copies of those chromosomes within its genome.

DNA Sequencing:

- DNA sequencing is the process of determining the nucleotide sequence of DNA (deoxyribonucleic acid).
- DNA is made up of four chemical building blocks – called “bases” – adenine, guanine, cytosine, and thymine.
- It involves determining the sequence of these bases which encodes the biological information that cells use to develop and operate.
- The nucleotide sequence is the most fundamental level of knowledge of a gene or genome. It is the blueprint that contains the instructions for building an organism.
- Human genome contains about 3 billion base pairs that spell out the instructions for making and maintaining a human being.



DNA sequencing methods:

- Maxam-Gilbert sequencing
- Chain-termination methods
- Shotgun sequencing
- Single molecule real time (SMRT) sequencing
- Nanopore DNA sequencing
- In India, Next Generation Sequencing (NGS) facilities are available; which are also represented in the Indian SARS-CoV -2 Genomics Consortium (INSACOG).

Melocanna Baccifera

Context: Melocanna Baccifera, a tropical bamboo species, has long intrigued researchers for its association with the occurrence of ‘bamboo death,’ ‘rat floods’ and famines in northeast India.

About Melocanna Baccifera:

- Melocanna Baccifera is an evergreen bamboo with an elongated rhizome that produces single culms arising at a distance of about 60 cm apart and reaching a height of 10 – 20 metres.
- The thin-walled culms have a diameter of 50 – 90mm, with internodes 30 – 60cm long. It is an aggressive bamboo, easily occupying large open areas, due to its vigorous long rhizomes and, when fruiting, due to its easily germinating fruits.
- One of the most useful bamboos within its native range, especially in Bangladesh, it provides edible shoots, medicine and culms that have a wide range of uses.
- The plant is also grown as an ornamental purposes.

Cultivation of Melocanna Baccifera:

- A plant of the moist tropics. It grows best in areas where the mean annual temperature falls within the range 20 – 33°C, though it can tolerate 15 – 38°C.
- It prefers a mean annual rainfall in the range 2,000 – 3,000mm, tolerating 600 – 4,400mm.

- Succeeds in moist soils, preferring a fertile medium to heavy soil.
- Young shoots are harvested in the rainy season. Culms are considered mature when 2 years old.
- The average green culm yield is estimated at 12,000 culms/ha per 3 years, weighing about 84 tonnes.
- Bamboos have an interesting method of growth. Each plant produces a number of new stems annually – these stems grow to their maximum height in their first year of growth, subsequent growth in the stem being limited to the production of new side branches and leaves.
- Bamboos in general are usually monocarpic, living for many years before flowering, then flowering and seeding profusely for a period of 1 – 3 years before usually dying.
- The plant flowers gregariously, with a flowering cycle of 30 – 45 years. In the season before flowering no new shoots are produced. Flowering may continue for about 10 years over a tract that is sometimes called a flowering wave.

Uses of Melocanna Baccifera:

Edible Uses:

- Young shoots – cooked
- The shoots are also sliced and dried in the sun for preservation
- The remarkable large fruits are fleshy and edible
- They are used as a famine food
- The leaves may be used in brewing liquor

Medicinal Uses:

- Tabashir, which is a siliceous concretion found in the culms of the bamboo stem, can be collected from the culms.
- It is used as a tonic in treating respiratory diseases.

Other Uses:

- The culms are widely used in house building; to make woven wares such as baskets, mats, handicrafts, wall plates, screens and hats; and for domestic utensils
- The culms are an important source of superior paper pulp

OneWeb Satellites

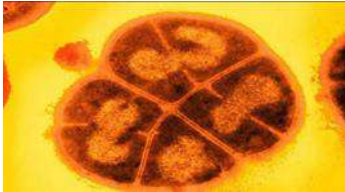
Context: Describing the simultaneous placement of 36 OneWeb satellites in space recently as a major feat, Prime Minister of India said that, the move would strengthen digital connectivity across the whole country.

About OneWeb:

- It is a global communications network, powered from space, enabling connectivity for governments, businesses, and communities.
- OneWeb has teamed up with NewSpace India Limited (NSIL), the commercial arm of national space agency Indian Space Research Organisation (ISRO) to facilitate the launch.

How our connectivity works



	<ul style="list-style-type: none"> • OneWeb Constellation Summary: OneWeb Constellation operates in a LEO Polar Orbit • Satellites are arranged in 12 rings (Orbital planes) with 49 satellites in each plane. • Each satellite completes a full trip around the earth every 109 minutes. • The earth is rotating underneath satellites, so they will always be flying over new locations on the ground. <p>MUST READ: NewSpace India pvt ltd</p>
<p>Coronal Holes</p>	<p>Context: Recently, NASA’s Solar Dynamics Observatory caught the Sun “smiling.” Seen in ultraviolet light, these dark patches on the Sun are known as coronal holes and are regions where fast solar wind gushes out into space.</p> <p>About Coronal holes:</p> <ul style="list-style-type: none"> • These are regions on the sun’s surface from where fast solar wind gushes out into space. • Because they contain little solar material, they have lower temperatures and thus appear much darker than their surroundings. • Here, the magnetic field is open to interplanetary space, sending solar material out in a high-speed stream of solar wind. • Coronal holes can last between a few weeks to months. • They can last much longer during solar minimum – a period of time when activity on the Sun is substantially diminished • These coronal holes are important to understand the space environment around the earth. • While it is unclear what causes coronal holes, they correlate to areas on the sun where magnetic fields soar up and away, without looping back down to the surface as they do elsewhere.  <p>Geomagnetic Storm:</p> <ul style="list-style-type: none"> • Geomagnetic storms relate to earth’s magnetosphere – the space around a planet that is influenced by its magnetic field. • When a high-speed solar stream arrives at the earth, in certain circumstances it can allow energetic solar wind particles to hit the atmosphere over the poles. • Such geomagnetic storms cause a major disturbance of the magnetosphere as there is a very efficient exchange of energy from the solar wind into the space environment surrounding earth. • In cases of a strong solar wind reaching the earth, the resulting geomagnetic storm can cause changes in the ionosphere, part of the earth’s upper atmosphere. • Radio and GPS signals travel through this layer of the atmosphere, and so communications can get disrupted.
<p>Deinococcus Radiodurans/ Conan the Bacterium</p>	<p>Context: Recently, researchers simulated the harsh ionising radiation on Mars in a new study where they found that ancient bacteria could potentially survive close to the surface of the planet much longer than previously thought.</p> <ul style="list-style-type: none"> • A new study shatters that record, finding the hearty bacterium could survive 280 million years if buried. This means evidence of life could still be dormant and buried below Mars’ surface. <p>About Deinococcus Radiodurans:</p> 

	<ul style="list-style-type: none"> • Many of the terrestrial microorganisms proved that they might be able to survive on Mars, but one particular microbe called <i>Deinococcus Radiodurans</i> seemed particularly well-suited to living on the planet. • The researchers nicknamed the bacteria “Conan the bacterium” for its ability to survive massive amounts of radiation while frozen. • This means that scientists might even find bacteria and bacteria remains when the first samples from Mars come back to our planet. • To understand whether any life forms could survive the harsh climatic conditions on Mars, the research team exposed six different terrestrial bacteria and fungi under conditions similar to life on the red planet. • They did this by freezing the microbes and hitting them with gamma rays and protons.
<p>Coronary Artery Disease</p>	<p>In news: A study conducted by Sir Ganga Ram Hospital has said that Indians have an increased risk of Coronary Artery Disease (CAD) because of their smaller body surface area and not just a smaller diameter of arteries.</p> <ul style="list-style-type: none"> • It was based on observational impact on 250 patients. • 51 per cent respondents were hypertensive, 18 per cent were diabetic, four per cent were smokers, 28 per cent were dyslipidemic and 26 per cent had a family history of heart disease. <p>Findings:</p> <ul style="list-style-type: none"> • This study was done to estimate the size of normal coronary arteries in the Indian population, index it to BSA, and see if there is any significant difference when compared to the Caucasian population. • There has been an assumption that Asians, and particularly Indians, have increased risk of atherosclerosis (fatty deposits in arteries) because of their small coronary artery diameter. • However, from our observational study, it is proved that the coronary artery dimensions in the Indian population are not small, the risk is due to their small Body Surface Area. Thus, the rationale for small dimensions of arteries being a risk factor for CAD is not valid in the Indian population. • The mean vessel diameter for males was significantly larger than those for females but when indexed to the Body Surface Area, these values were not significant. • The study might also provide some insight into the use of diameters indexed to BSA as a cut off for deciding the need for re-vascularisation (a procedure that can restore blood flow in blocked arteries or veins).
<p>Chinese Space Station</p>	<p>In news: China’s third and final module called Mengtian docked with its permanent space station called Tiangong to further a more than decade-long effort to maintain a constant crewed presence in orbit, as its competition with the U.S. grows increasingly fierce.</p> <ul style="list-style-type: none"> • 3 astronauts arrived for a six-month stay on board, during which they will complete the station’s assembly, conduct space walks and carry out additional experiments.



About Mengtian:

- Mengtian is the third and final module which was blasted into space from the Wenchang Satellite Launch Centre on the southern island province of Hainan.
- Mengtian, or “Celestial Dream,” joins Wentian as the second laboratory module for the station, collectively known as Tiangong, or “Celestial Palace.” Both are connected to the Tianhe core module where the crew lives and works.
- Like its predecessors, Mengtian was launched aboard a Long March-5B carrier rocket, a member of China’s most powerful family of launch vehicles.
- Mengtian weighs in at about 23 tons, is 17.9 meters (58.7 feet) long and has a diameter of 4.2 meters (13.8 feet). It will provide space for science experiments in zero gravity, an airlock for exposure to the vacuum of space, and a small robotic arm to support extravehicular payloads.
- The already orbiting 23-ton Wentian, or “quest for the heavens” laboratory is designed for science and biology experiments and is heavier than any other single-module spacecraft currently in space.
- Following Mengtian’s arrival, an additional uncrewed Tianzhou cargo craft is due to dock with the station.

About Tiangong:

- It is currently populated by a crew of two male and one female astronauts.
- In all, the station will have about 110 cubic meters (3,880 cubic feet) of pressurized interior space, including the 32 cubic meters (1,130 cubic feet).
- China’s crewed space program is officially three decades old this year, with the Mengtian launch being its 25th mission. But it truly got underway in 2003, when China became only the third country after the U.S. and Russia to put a human into space using its own resources.
- The permanent Chinese station will weigh about 66 tons — a fraction of the size of the International Space Station, which launched its first module in 1998 and weighs around 465 tons.
- With a lifespan of 10 to 15 years, Tiangong could one day find itself the only space station still running, if the International Space Station adheres to its 30-year operating plan.

Other missions:

- Prior to launching the Tianhe module, China’s Manned Space Program launched a pair of single-module stations that it crewed briefly as test platforms.
- Next year, China plans to launch the Xuntian space telescope, which, while not a part of Tiangong, will orbit in sequence with the station and can dock occasionally with it for maintenance.
- China has also chalked up successes with uncrewed missions, and its lunar exploration program generated media buzz last year when its Yutu 2 rover sent back pictures of a rock. The rover is the first to be placed on the far side of the moon.
- China’s Chang’e 5 probe returned lunar rocks to Earth for the first time since the 1970s in December 2000 and another Chinese rover is searching for evidence of life on Mars.
- China is collaborating with the European Space Agency on experiments aboard Mengtian, and is cooperating with France, Germany, Italy, Russia, Pakistan and the UN Office for Outer Space Affairs (UNOOSA) on a range of projects from aerospace medicine to microgravity physics.
- China is also reportedly developing a highly secret space plane.

China's Beidou satellite navigation system (BDS)

In News: China outlined plans to further expand global reach of its home-grown Beidou satellite navigation system.

- South Asia and Southeast Asia – both of which are key BRI regions – are a current focus of expanding Beidou's presence.
- Built as its alternative to America's Global Positioning System (GPS).
- BDS has a "constellation" of 30 satellites in orbit.
- It began its international outreach once the set up was finished in 2018.
- Its application included use in guiding drones, autonomous cars, in agriculture and forestry, as well as launching with Chinese mobile phone companies, using Chinese chips, satellite-powered messaging for smartphones that provides for connectivity in remote areas even in the absence of ground reception.
- It is now in use "in more than half of the world's countries".
- Saudi Arabia is using Beidou in surveying and mapping, positioning people and vehicle in the desert
- Tajikistan is using BDS to monitor dams and lakes with precision.
- Lebanon is using BDS at Beirut port for marine survey and construction.
- In Burkina Faso, it is being used for survey and construction of hospitals.
- China and Russia have signed a strategic framework on their two navigation systems, taking forward a 2015 deal on interoperability between Beidou and GLONASS (Russia).
- Pakistan in 2014 became the first foreign country to set up a Beidou network.
- Beijing is strengthening regional cooperation with organisations such as ASEAN, the African Union, the League of Arab States, and the Community of Latin American and Caribbean States.
- For ASEAN, Beidou has set up a first of three Continuously Operating Reference Stations (CORS) for its network in Thailand in 2013.
- China and Sri Lanka also agreed plans to set up 10 CORS. CORS in Thailand and Sri Lanka will extend the BDS coverage at least 3,000 km more towards Southeast Asia and South Asia.
- China is also helping several BRI partners, including Pakistan and Sri Lanka, launch communication satellites.

Other countries navigation systems:

- GPS (USA)
- Galileo (Europe)
- GLONASS (Russia)
- QZSS or Quasi-Zenith Satellite System (Japan)
- Korea Positioning System

MUST READ: [NAVIC \(India\)](#)

Cordy gold nanoparticles

Context: Bodoland University’s collaborative work on fungus-powered biosynthesised nanogold particles earns international patent.

About Cordy gold nanoparticles:

- **Cordy gold nanoparticles (Cor-AuNPs)**, the outcome of a collaborative experiment by scientists from four Indian institutions, has earned an international patent from Germany.
- These nanoparticles, derived from the synthesis of the extracts of Cordyceps militaris and gold salts, could make drug delivery in the human body faster and surer.
- Cordyceps militaris is a high-value parasitic fungus.
- Gold salts are ionic chemical compounds of gold generally used in medicine.
- Penetration in the cells is more when the drug particles are smaller.
- Cordyceps militaris, called super mushroom for its tremendous medicinal properties, adds bioactive components to the synthesis of gold nanoparticles for better penetration.
- The wild Cordyceps mushroom is found in the eastern Himalayan belt.
- Biosynthesised nanogold particles indicate a new application of nanoparticles in the development of therapeutic drugs that can be delivered as ointments, tablets, capsules, and in other forms.



About Cordyceps militaris:

- Cordyceps militaris is a species of fungus in the family Cordycipitaceae, and the type species of the genus Cordyceps.
- It was originally described by Carl Linnaeus in 1753 as Clavaria militaris.
- Cordyceps militaris is entomopathogenic fungus, i.e., it parasitizes insects.
- It can be cultivated in a variety of media, including silkworm pupae, rice, and liquid nutrition.
- It is a potential harbourer of bio-metabolites for herbal drugs and there is evidence from ancient times for its applications for revitalization of various systems of the body.
- It contains a protein CMP18 which induces apoptosis in vitro via a mitochondrion-dependent pathway.

Lycopene

Context: A team of researchers from the Institute of Nano Science and Technology (INST), Mohali, has developed a nano-biosensor for detecting ‘lycopene’, a phytochemical with high commercial value. The sensor uses a portable smartphone-based upconverting reusable fluorescent paper strip.

About Lycopene:

- Lycopene, belonging to the carotenoids, is a tetraterpene compound abundantly found in tomato and tomato-based products.
- It is fundamentally recognized as a potent antioxidant and a non-pro-vitamin A carotenoid.
- It has been found to be efficient in ameliorating cancer insurgences, diabetes mellitus, cardiac complications, oxidative stress-mediated malfunctions, inflammatory events, skin and bone diseases, hepatic, neural and reproductive disorders.

Natural Sources of Lycopene:

- Tomato and tomato-based products are the major dietary sources of lycopene and account for approximately 80% of the consumption of lycopene in western countries.

- It is also present in a high amount in watermelon, guava, pink grapefruit, rosehips, papaya, and apricot.

Applications of Lycopene

Anticancer:

- Inflammation is known as one of the most important key points in cancer. Therefore, lycopene, as one of the most potent anti-inflammatory nutraceuticals, is under research in many preclinical and clinical cancer studies.

Antidiabetic:

- There is scientific evidence which supports the beneficial role of lycopene against diabetes. Regarding animal studies and epidemiological surveys, it can be used for both the prevention and treatment of diabetes.

Cardioprotective:

- Lycopene is a cardioprotective nutraceutical as different research showed a protective effect against atherosclerosis and several CVDs.
- It can scavenge some of the potent oxidants that are known to be associated with atherosclerosis.

Antioxidative:

- Lycopene is a well-known antioxidant. It can protect DNA, proteins, and lipids against oxidation.
- In addition, “lycopene can act on other free radicals such as hydrogen peroxide, nitrogen dioxide and hydroxyl radicals”

Against Dermatologic Diseases:

- Treatment with lycopene decreased UVB-caused cell proliferation while increasing apoptosis via declining CDK2 and CDK4 in hairless SKH-1 mice and human keratinocytes.

Neuroprotective:

- The lycopene consumption relieved cognitive defects, age-related memory loss, neuronal damage, and synaptic dysfunction of the brain.
- Furthermore, lycopene consumption considerably reduced age-related neuroinflammatory disorders by decreasing microgliosis (IBA-1), as well as down-regulating inflammatory mediators.

Bone Protective:

- Lycopene has several molecular and cellular effects on human osteoblasts and osteoclasts.
- It reduced osteoclast differentiation, whereas it did not change cell survival/cell density; calcium-phosphate resorbing was also reduced.

Targeting Reproductive Disorders:

- Lycopene can decrease sperm DNA fragmentation, as well as lipid peroxidation by its antioxidant activity in normospermia infertile men.
- It improved the sperm count and motility by decreasing H₂O₂ and lipid peroxidation, and improving mitochondrial enzymatic activity and non-enzymatic antioxidant level (GSH and ascorbate).

Falcon Heavy Rocket

Context: Elon Musk owned SpaceX recently launched the Falcon Heavy rocket into a geosynchronous Earth orbit in Florida, U.S.

About Falcon Heavy Rocket:

- This is considered as a National Security Space Launch for the U.S. military.
- The company hails this as the most powerful operational rocket in the world.
- This is the fourth launch of the giant rocket system, and the first one in nearly three years since its last launch in 2019.
- The rocket is carrying satellites to space for the U.S. military in a mission named as U.S. Space Force (USSF)-44.

The mission deployed two spacecraft payloads:

- One is the TETRA 1 microsatellite created for various prototype missions in and around the geosynchronous earth orbit.
- It will place the satellites for the Space Systems Command's Innovation and Prototyping.
- Space Systems Command (SSC) is the oldest military space organisation in the United States Armed Forces.
- It is responsible for developing, acquiring, equipping, fielding and sustaining lethal and resilient space capabilities.
- SSC mission capability areas include launch acquisition and operations, communications and positioning, navigation and timing, space sensing, battle management command, control, and communications, and space domain awareness and combat power.

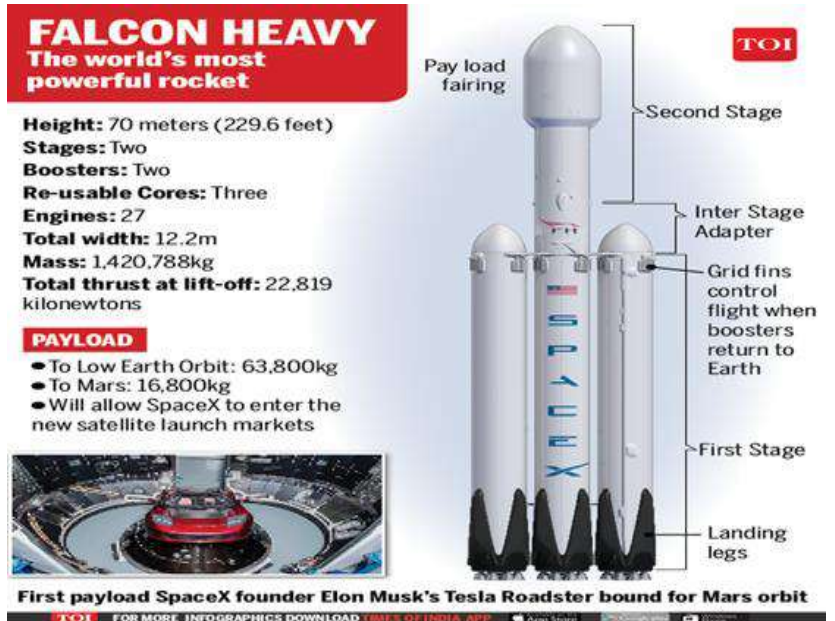
Glyphosate

In News: The Union Agriculture Ministry has restricted the use of glyphosate, a widely used herbicide.

- This comes even as the Supreme Court is about to take up a plea seeking a ban on all herbicide-tolerant crops, including transgenic hybrid mustard and cotton.

What is glyphosate?

- It is a herbicide used to kill weeds — undesirable plants that compete with crops for nutrients, water and sunlight.
- Glyphosate is a broad-spectrum herbicide that can control a wide range of weeds, whether broadleaf or grassy.
- It is also non-selective, killing most plants.
- When applied to their leaves, it inhibits the production of a protein '5-enolpyruvylshikimate-3-phosphate synthase (EPSPS)'.
- This enzyme, produced only by plants and microorganisms, synthesises aromatic amino acids that are necessary for their growth.



Use in India

- There are nine glyphosate-based formulations containing different concentrations of the chemical registered for use under the Insecticides Act, 1968
- These are approved largely for weed control in tea gardens and non-crop areas such as railway tracks or playgrounds.
- Farmers also apply glyphosate on irrigation channels and bunds to clear these of weeds, making it easier for water to flow and to walk through them.

Concerns

- In general, though, the scope for glyphosate use is limited for the very reason that it is non-selective.
- Designed to kill all plants coming into contact with it, the chemical cannot ordinarily distinguish between crop and weed.
- Hence, it can be used in tea or rubber plantations, but not in fields where the crops and weeds are at almost the same level..

Must Read: [GM Crops and their regulation](#)

India's first private rocket - Vikram-S

In News: India's first privately developed rocket — Vikram-S — is set for a launch between November 12 and 16, Hyderabad-based space startup Skyroot Aerospace announced.

- The maiden mission of Skyroot Aerospace, named 'Prarambh' (the beginning), will carry three customer payloads and is set for launch from Indian Space Research Organisation's launchpad at Sriharikota.
- The launch mission will be a suborbital spaceflight.
- Among the three payloads is a 2.5kg satellite of another space startup, Space Kidz India, which has been built by students from India, the US and Indonesia.
- Skyroot, a two-time national award winner, is the first start-up to sign a Memorandum of Understanding (MoU) with ISRO in this regard.

Vikram-S rocket:

- The Vikram series, named after the founder of India's space programme Dr Vikram Sarabhai, are all-carbon-fibre structures that can launch up to 800 kg of payloads to the Low Earth Orbit.
- The Vikram-S rocket is a single-stage sub-orbital launch vehicle which would carry three customer payloads and help test and validate the majority of the technologies in the Vikram series of space launch vehicles.

Suborbital spaceflight:

- A suborbital spaceflight refers to a height of around 100km from the Earth's surface, and is done at a lower altitude than an orbital flight, which reaches at least a low-Earth orbit — between around 200km to 2,000km from Earth.
- Suborbital flights are known to be important for conducting tests of space missions, before final commercial missions take place.

New era for Indian space sector:



	<ul style="list-style-type: none"> With this mission, Skyroot Aerospace is set to become the first private space company in India to launch a rocket into space, heralding a new era for the space sector which was opened up in 2020 to facilitate private sector participation. <p>Must Read: Privatisation of Space Sector + Role of private sector in Space</p>
<p>Xenotransplantation</p>	<p>Context: Recently researchers have said that genetically modified pig heart took longer to generate a heartbeat than hearts of pigs or humans usually do. The 57-year-old recipient lived for 61 days after the transplant in January 2022.</p> <p>About Xenotransplantation:</p> <ul style="list-style-type: none"> Xenotransplantation is any procedure that involves the transplantation, implantation or infusion into a human recipient of either (a) live cells, tissues, or organs from a nonhuman animal source, or (b) human body fluids, cells, tissues or organs that have had ex vivo contact with live nonhuman animal cells, tissues or organs. In 2021, surgeons at New York University Langone Health transplanted kidneys from the same line of genetically modified pigs into two legally dead people with no discernible brain function. The organs were not rejected, and functioned normally while the deceased recipients were sustained on ventilators. <p>Benefits :</p> <ul style="list-style-type: none"> Recent evidence has suggested that transplantation of cells and tissues may be therapeutic for certain diseases such as neurodegenerative disorders and diabetes, where, again, human materials are not usually available. <p>Issues :</p> <ul style="list-style-type: none"> The use of xenotransplantation raises concerns regarding the potential infection of recipients with both recognized and unrecognised infectious agents and the possible subsequent transmission to their close contacts and into the general human population. Moreover, new infectious agents may not be readily identifiable with current techniques.
<p>Beaver blood moon</p>	<p>In News: A rare spectacle of a “Beaver blood moon” was seen as the Earth, moon and sun align to produce a total lunar eclipse for the last time until 2025.</p> <ul style="list-style-type: none"> This was the second blood moon of the year. It was visible across eastern Asia & Australia (in evening moonrise), the Pacific and North America (in early morning hours) It will be visible to the naked eye wherever skies are clear in those regions. A total lunar eclipse occurs when the Earth casts its shadow completely over a full moon, blocking reflection of all direct sunlight from the lunar orb and dimming the colour of the moon to a reddish hue, hence the term “blood moon.” <div data-bbox="320 1637 871 1944" data-label="Image"> </div> <ul style="list-style-type: none"> This is only possible when the orbits of the Earth, moon and sun align so that the moon is directly behind Earth relative to the sun. Moon’s orbit around Earth is usually tilted relative to Earth’s orbit about the sun. <p>Hence, the moon passes above or below Earth’s shadow because of its orbit.</p> <ul style="list-style-type: none"> Outer shadow is called “penumbra,” and the darker, inner shadow is called the “umbra,” before reaching totality.

	<ul style="list-style-type: none"> • Reddish appearance of the lunar surface is caused by rays of sunlight around the outer edge of the eclipse shadow, or umbra, being filtered and refracted as it passes through Earth's atmosphere, bathing the moon indirectly in a dim copper glow. • Degree of redness depends on atmospheric conditions that vary with levels of air pollution, dust storms, wildfire smoke and even volcanic ash. • Rarity: Total lunar eclipses occur, on average, about once every year and a half, but the interval varies. • Beaver moon: is a moniker for November's full moon adopted by the Old Farmer's Almanac supposedly from Algonquian languages once spoken by Native Americans in the New England territory. When combined with the phenomena of a total lunar eclipse, it is widely referred to as a "Beaver blood moon" in the United States.
Benzene found in dry shampoos	<p>In News: Valisure, a New Haven, Connecticut-based analytical laboratory, tested 148 batches from 34 brands of spray-on dry shampoo and found that 70% contained benzene.</p> <p>About Benzene:</p> <ul style="list-style-type: none"> • Benzene is a colourless or light-yellow liquid chemical at room temperature. • It is used primarily as a solvent in the chemical and pharmaceutical industries, as a starting material and an intermediate in the synthesis of numerous chemicals, and in gasoline. • Benzene is produced by both natural and man-made processes. • It is a natural component of crude oil, which is the main source of benzene produced today. • Other natural sources include gas emissions from volcanoes and forest fires. • Cigarette smoke is another source of benzene exposure. • Benzene may also be found in glues, adhesives, cleaning products, and paint strippers. • Outdoor air contains low levels of benzene from second-hand tobacco smoke, gasoline fumes, motor vehicle exhaust, and industrial emissions.
Mastodon	<p>Context: Amid concerns over the direction that Twitter seems to be taking after its takeover by billionaire Elon Musk, a number of users are flocking to a platform called Mastodon, a decentralised, open source social media platform.</p> <p>About Mastodon:</p> <ul style="list-style-type: none"> • Mastodon was founded in 2016 by a German software developer. • Unlike Facebook, Twitter, Reddit, and Instagram, it is a decentralised, open source, ad-free platform that is essentially made up of thousands of different servers, or "instances", run across the world. • All the different instances on Mastodon can communicate to each other, that is, what users in a certain instance are posting is accessible to users in a different instance. • Users or organisations can even start their own servers. • Otherwise, there's a list of servers which focus on specific locations or topics of interest. • The admin of each server can decide the content moderation guidelines for that particular server. • It essentially means that anyone can download, modify and install Mastodon on their own server. • The developers of the platform don't own the copyright. • However, if someone creates a platform using Mastodon's code, they will have to acknowledge the source of the code. <p>Content moderation on Mastodon:</p>

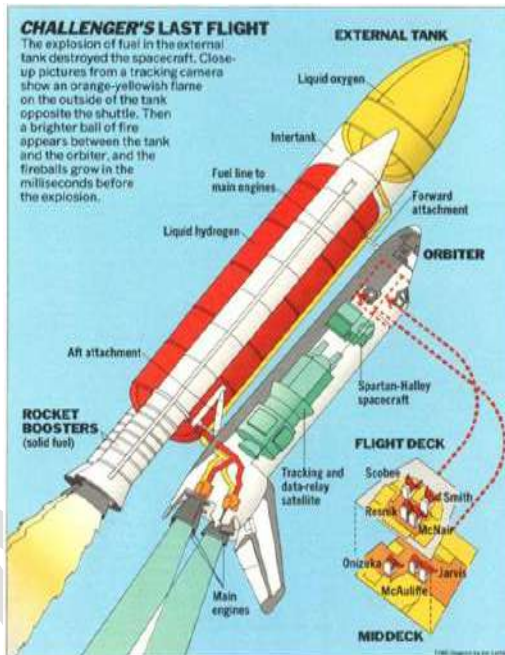
- Since Mastodon is a collection of thousands of different servers, there is not a singular content moderation strategy for the entire platform.
- Content moderation is done by admins of each server who can set their own rules — this means that a kind of speech allowed on one server may not be allowed on a different one.
- Users can also migrate to other instances on Mastodon.

Challenger spaceship

Context: NASA has announced the recovery of debris from the Challenger spaceship that exploded 73 seconds after lift-off killing all seven astronauts aboard 37 years ago.

About the mission:

- The shuttle mission, which was NASA’s 25th, was supposed to be a six-day mission wherein, the seven-member crew was to deploy a large communications satellite, deploy and retrieve an astronomy payload to study Halley’s Comet.
- A teacher, also the first civilian to head to space, was to conduct lessons for schoolchildren from orbit.
- The primary objective of the STS-51L mission was to launch the second Tracking and Data Relay System (TDRS) satellite into orbit.



The Space shuttle disaster:

- The spacecraft broke apart on January 28, 1986 after it suffered a major malfunction less than 2 minutes into its flight with investigations revealing freezing temperatures having affected the integrity of O-ring seals in the solid rocket booster segment joints.
- The O-ring seals are used to keep fluids from leaking and components sealed.
- Ice had formed on the shuttle amid freezing temperatures as Challenger remained on the launch pad overnight.
- The last Challenger mission was dubbed as STS-51L.

Antimicrobial Resistance (AMR)

Context: Recently an international network under Natural Livestock Farming Foundation (NLF) a non-profit has developed an effective methodology to support farmers in reducing their use of antibiotics and other veterinary drugs in smallholder and large-scale dairy systems.

About Antimicrobials and Anti-microbial resistance:

- Antimicrobials – including antibiotics, antivirals, antifungals and antiparasitics – are medicines used to prevent and treat infections in humans, animals and plants.
- Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death.
- As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or impossible to treat.

Factors that accelerates the emergence and spread of AMR:

- AMR occurs naturally over time, usually through genetic changes. Antimicrobial resistant organisms are found in people, animals, food, plants and the environment (in water, soil and air).
- They can spread from person to person

or between people and animals, including from food of animal origin.

- The main drivers of antimicrobial resistance include the misuse and overuse of antimicrobials; lack of access to clean water, sanitation and hygiene (WASH) for both humans and animals; poor infection and disease prevention and control in health-care facilities and farms; poor access to quality, affordable medicines, vaccines and diagnostics; lack of awareness and knowledge; and lack of enforcement of legislation.

About Global Action Plan on Antimicrobial Resistance (GAP):

- Globally, countries committed to the framework set out in the Global Action Plan1 (GAP) 2015 on AMR during the 2015 World Health Assembly and committed to the development and implementation of multisectoral national action plans.
- It was subsequently endorsed by the Governing Bodies of the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE).
- Prior to the endorsement of the GAP in 2015, global efforts to contain AMR included the WHO global strategy for containment of Antimicrobial Resistance developed in 2001 which provides a framework of interventions to slow the emergence and reduce the spread of AMR.

World Antimicrobial Awareness Week (WAAW):


- WAAW was previously called World Antibiotic Awareness Week. Since 2020, it has been called World Antimicrobial Awareness Week.
- Held annually event since 2015, WAAW is a global campaign that aims to raise awareness of antimicrobial resistance worldwide and encourage best practices among the general public, health workers and policy makers to slow the development and spread of drug-resistant infections.
- The Tripartite Executive Committee decided to set all future WAAW dates as 18 to 24 November. The overarching slogan used for the last 5 years was “Antibiotics: Handle with Care.” This was changed to “Antimicrobials: Handle with Care” in 2020.

The Global Antimicrobial Resistance and Use Surveillance System (GLASS):

- WHO launched the Global Antimicrobial Resistance and Use Surveillance System (GLASS) in 2015 to continue filling knowledge gaps and to inform strategies at all levels.
- GLASS provides a standardized approach to the collection, analysis, interpretation and sharing of data by countries, territories and areas, and monitors the status of existing and new national surveillance systems, with emphasis on representativeness and quality of data collection.

About the National Dairy Development Board (NDDB):

- The National Dairy Development Board initially registered as a society under the Societies Act 1860 was merged with the erstwhile Indian Dairy Corporation, a company formed and

	<p>registered under the Companies Act 1956, by an Act of India’s Parliament – the NDDDB Act 1987 with effect from 12 October, 1987.</p> <ul style="list-style-type: none"> • The new body corporate was declared an institution of national importance by the Act. • Its head office is in Gujrat. • The general superintendence, direction, control and management of NDDB’s affairs and business vests with the Board of Directors. • The Dairy Board was created to promote, finance and support producer-owned and controlled organisations. • NDDB began its operations with the mission of making dairying a vehicle to a better future for millions of grassroots milk producers. • The mission achieved thrust and direction with the launching of “Operation Flood”, a programme extending over 26 years and which used World Bank loan to finance India’s emergence as the world’s largest milk producing nation. • As of March 2019, India’s 1,90,500 village dairy cooperatives affiliated to 245 milk unions & marketing dairies and 22 federations & apex bodies procured on an average 508 Lakh kg of milk every day. 16.9 million farmers are currently members of village dairy cooperatives.
<p>Cerebrotendinous Xanthomatosis (CTX)</p>	<p>Context: Recently researchers from Hyderabad have rescued a nine year old boy from a rare progressive genetic disease identified as Cerebrotendinous Xanthomatosis or CTX at an early stage.</p> <p>About Cerebrotendinous Xanthomatosis (CTX):</p> <ul style="list-style-type: none"> • Cerebrotendinous xanthomatosis (CTX) is a lipid storage disease characterized by infantile-onset Diarrhea, childhood-onset cataract, adolescent- to young adult-onset tendon xanthomas, and adult-onset progressive neurologic dysfunction (dementia, psychiatric disturbances, pyramidal and/or cerebellar signs, dystonia, atypical parkinsonism, peripheral neuropathy, and seizures).  <ul style="list-style-type: none"> • Patients with CTX are unable to break down different forms of cholesterol, which build up in certain areas of the body. • CTX is characterized by fatty yellow nodules (xanthomas) located in the connective tissues within the brain. • These deposits can cause progressive damage to the brain and other areas of the body. • Patients with CTX do not have elevated levels of cholesterol in their blood; however, they do have elevated levels in their tissues.
<p>The Centre for Development of Telematics (C-DOT)</p>	<p>Context: The government of India has approved a Rs 124 crore proposal for setting up incubation centres in the Delhi and Bengaluru campuses of the Centre for Development of Telematics (C-DoT) under the Digital Communication Innovation Square (DCIS) under Champion Services Sector Scheme.</p> <p>About The Centre for Development of Telematics (C-DOT):</p> <ul style="list-style-type: none"> • Centre for Development of Telematics (C-DOT) was established in August 1984 as an autonomous Telecom R&D centre of Dept o Telecommunication, Govt. of India. • It is a registered society under the Societies Registration Act, 1860.

- It is a registered ‘public funded research institution’ with the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology, Government of India.
- C-DOT as a torch bearer of indigenous telecom R&D continues to develop latest technology products in areas like Optical, Switching, Wireless, Security and Network Management while also working on futuristic technologies like M2M/IOT, 5G, AI, etc.
- C-DOT reiterates its unequivocal commitment to the betterment of country’s telecom sector by working towards realizing the objectives of various flagship programs of the Government of India that include Digital India, Make in India, BharatNet, Skill India, Startup India and Smart Cities.
- Chairman: Union Minister of Communication & IT
- Vice Chairman: Union Minister of State for Communication & IT
- Members: 10 other members from various ministries and telecom sectors
- Customer Segments: Defence organizations & Strategic agencies, public sector / Govt. , Educational institutions, Manufacturing sector / Toll Operate Transfer partners, TSPs and ISPs etc

Success stories of C-DOT:

- ‘GyanSetu’ is an internet based real-time ICT system designed by C-DOT, primarily to provide various eservices to the under privileged rural population of India.
- **MAX-NG, C-DOT’s Next Generation Network (NGN) solution** addresses the needs of the changing telecom scenario and enables a smooth transition from Plain Old Telephone System (POTS) to NGN based Voiceover-IP (VoIP).
- Launch of Broadband Products:
- During Digital India Week, C-DOT launched four products and inaugurated IMS compliant NGN Services in MTNL network.
- High Speed, long distance Wi-Fi solution is Ideal for increasing the penetration of broadband services in difficult and inaccessible terrains e.g., hilly areas, dense vegetation, islands, unconnected villages. disaster sites, border areas, tunnels, Battlefield Surveillance.

Inauguration of Terabit Router & FTTD Solution:

- C-DOT has designed and developed India’s first indigenous Terabit Router.
- Hon’ble Minister of Communications & IT inaugurated C-DOT Terabit Router along with GPON based Fiber-to-the-Desk solution (FTTD) during a TSDSI function held at C-DOT Campus in October 2014.

India’s first-ever night sky sanctuary in Ladakh

Context: According to sources, the work on India’s first-ever night sky sanctuary in Ladakh will be completed in a month.

About the Sanctuary:

- It is being set up by Council of Scientific and Industrial Research under Union Ministry of Science & Technology.
- The proposed Dark Sky Reserve will be located at Hanle in Ladakh as a part of Changthang Wildlife Sanctuary.



red, and gamma-ray telescopes.

- Hanle is located in Ladakh's cold desert region, away from any form of human disturbance with clear sky conditions and dry weather conditions that exist throughout the year.

- The Changthang Wildlife Sanctuary is a high altitude wildlife sanctuary located in the Ladakh adjunct of the Changthang plateau.

- It will boost Astro tourism in India and will be one of the world's highest-located sites for optical, infra-

SARAS radio telescope

In news: In a first-of-its-kind work, using data from SARAS 3, researchers from the Raman Research Institute (RRI), Bengaluru, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, along with collaborators at the University of Cambridge and the University of Tel-Aviv, have estimated the energy output, luminosity, and masses of the first generation of galaxies that are bright in radio wavelengths.

About SARAS:

- It is called Shaped Antenna measurement of the background Radio Spectrum 3 (SARAS) telescope.
- Indigenously designed and built at Raman Research Institute
- Deployed over Dandiganahalli Lake and Sharavati backwaters, located in Northern Karnataka, in early 2020.
- SARAS 2 was the first to inform the properties of earliest stars and galaxies.
- The results from the SARAS 3 telescope are the first time that radio observations of the averaged 21-centimeter line have been able to determine the properties of radio luminous galaxies formed just 200 million years post the Big Bang (or Cosmic Dawn) and which are usually powered by supermassive black holes.
- SARAS 3 informs us that less than 3 percent of the gaseous matter within early galaxies was converted into stars, and that the earliest galaxies that were bright in radio emission were also strong in X-rays, which heated the cosmic gas in and around the early galaxies.
- It is used to reject claims of the detection of an anomalous 21-cm signal from Cosmic Dawn made by the EDGES radio telescope developed by researchers from Arizona State University (ASU) and MIT, USA.
- This refusal helped restore confidence in the concordant model of cosmology that was brought into question by the claimed detection.
- The analysis has shown that the 21-cm hydrogen signal can inform about the population of first stars and galaxies.

About the study:

- Scientists study the properties of very early galaxies by observing radiation from hydrogen atoms in and around the galaxies, emitted at a frequency of approximately 1420 MHz
- The radiation is stretched by the expansion of the universe, as it travels to us across space and time, and arrives at Earth in lower frequency radio bands 50-200 MHz, also used by FM and TV transmissions.
- The cosmic signal is extremely faint, buried in orders of magnitude brighter radiation from our own Galaxy and man-made terrestrial interference.

	<ul style="list-style-type: none"> • Therefore, detecting the signal, even using the most powerful existing radio telescopes, has remained a challenge for astronomers. • Usage: Even non-detection of this line from the early Universe can allow astronomers to study the properties of the very first galaxies by reaching exceptional sensitivity.
Bluebugging	<p>In News: Apps that let users connect smartphones or laptops to wireless earplugs can record conversations, and are vulnerable to hacks including iPhones.</p> <ul style="list-style-type: none"> • Any app with access to Bluetooth can record users' conversations with Siri and audio from the iOS keyboard dictation feature when using AirPods or Beats headsets. <p>About Bluebugging:</p> <ul style="list-style-type: none"> • It is a form of hacking that lets attackers access a device through its discoverable Bluetooth connection. • Once a device or phone is bluebugged, a hacker can • download phone books, call lists, listen to the calls • read and send messages • steal and modify contacts • install malware • gain unauthorised access to apps with Bluetooth access and control them. • Bluebugging attacks work by exploiting Bluetooth-enabled devices which is in discoverable mode (which is the default setting on most devices) and 10-metre radius of the hacker. • The hacker then tries to pair with the device via Bluetooth. Once a connection is established, hackers can use brute force attacks to bypass authentication. • Hackers can use booster antennas to widen the attack range. <p>Susceptibility:</p> <ul style="list-style-type: none"> • Smartphones and Laptops or any Bluetooth-enabled device • Wireless earbuds like AirPods can record conversations as they enable users to connect to their TWS (True Wireless Stereo) devices • Devices with short PINs for a password can be easily cracked. <p>Prevention:</p> <ul style="list-style-type: none"> • Turning off Bluetooth and disconnecting paired Bluetooth devices when not in use (make it undiscoverable) from Bluetooth settings • Updating the device's system software to the latest version • Limiting the use of public Wi-Fi • Using VPN as an additional security measure • Watch out for suspicious activities on their devices eg. phone is suddenly disconnecting and reconnecting calls, or if you notice messages that haven't been sent by you • Reset the device to its factory settings or uninstall any apps you don't recognise • Monitor sudden spikes in data usage. • Modern anti-virus software can also help thwart such attacks by helping users to detect strange and spam-like content by filtering, blocking and consistently reminding people to be alert.
Polygraph test	<p>In news: Delhi Police approached a court to conduct a polygraph test on Aaftab Poonawala, suspected of killing his partner Shraddha Walkar, to help investigators find the missing weapon and other evidence in the murder case.</p> <p>About polygraph test:</p>

- **A polygraph test is a lie detector test.**
- It assumes that physiological responses (heartbeat, changes in breathing, sweating, etc.) triggered when a person is lying are different from what they would be otherwise.
- First done in the 19th century by the Italian criminologist Cesare Lombroso, who used a machine to measure changes in the blood pressure of criminal suspects during interrogation.
- **Neither polygraph tests nor narco tests have been proven scientifically to have a 100% success rate, and remain contentious in the medical field as well.**
- The results of the tests cannot be considered “confessions”.
- However, any information or material subsequently discovered with the help of such a voluntarily-taken test can be admitted as evidence, the Supreme Court said, in ‘**Selvi & Ors vs State of Karnataka & Anr**’ (2010).
- **No lie detector tests should be administered except based on consent of the accused.**
- **The consent should be recorded before a judicial magistrate.**
- Those who volunteer must have access to a lawyer, and have the physical, emotional, and legal implications of the test explained to them by police and the lawyer.
- **the ‘Guidelines for the Administration of Polygraph Test on an Accused’ published by the National Human Rights Commission in 2000, must be strictly followed.**



The **Supreme Court** took into consideration international norms on **human rights, the right to a fair trial, and the right against self-incrimination under Article 20(3) of the Constitution**, as it is feared that a false confession could be obtained at times when a case needs to be solved quickly.



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EWS quota

In News: Supreme Court, in a 3:2 majority decision, upheld the validity of 103rd constitutional amendment and held that the 10% EWS quota to “poorest of poor” among forward castes did not pose any danger to the Basic Structure of the Constitution.

Background: Reservation is a form of quota-based affirmative action governed by constitutional laws in India.

Current reservation in India: ST- 7.5%, SC - 15%, OBC - 27%, EWS - 10%, Total - 59.5%.

- Article 14 states that the State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India. Supreme Court held that where equals and unequal’s are treated differently, Article 14 does not apply.
- Article 15 provides that the State shall not discriminate against any citizen on grounds only of religion, race, caste, sex or place of birth.
- Exception to article 15 – The 103rd Constitutional Amendment provides 10% reservation in government jobs and educational institutions to the ‘economically weaker sections’ of the society but excludes the ‘poorest of poor’ among Scheduled Castes (SC), Scheduled Tribes (ST), Socially and Educationally Backward Classes (SEBC) and Other Backward Classes (OBC) from its scope.

Current issues in reservation:

- Indira Sawhney judgment in 1992: SC upheld the principle that the combined reservation beneficiaries should not exceed 50% of India’s population. However, with EWS reservation of 10%, the total reservation in India’s population amounts to almost 60%.
- Rohini Commission report: Asymmetrical distribution of reservation – 97% of central OBC quota benefits go to just under 25% of its castes. As many as 983 OBC communities — 37% of the total — have zero representation in both central government jobs and admissions to central universities.
- Data Deficiency: There is hardly any legible data on the socio-economic conditions of varied social groups at State & local level. Also, we do not know what liberalisation has done to castes which remained tied to more traditional sources of income.
- The creamy layer threshold: SC admits plea challenging Rs 8 lakh EWS annual income criteria is the same as that for the creamy layer of Other Backward Classes quota and is unfair.
- Lack of merit-based recognition

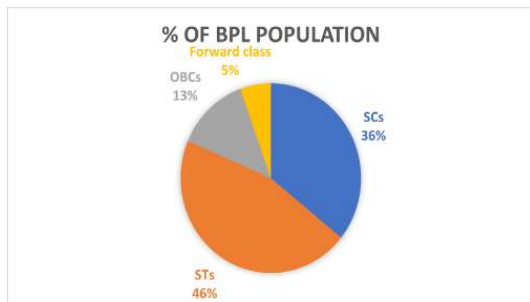
Significance of the judgement:

- Expansive view: Reservation was an “instrument of affirmative action by the state” and should not be confined to just SCs, STs, SEBCs, and the non-creamy layer of OBCs, but also include “any class or sections so disadvantaged as to answer the description of ‘weaker section’”
- 103rd Amendment only created “a separate class of EWS without affecting the special right of reservation provided to SEBCs, STs, SCs and OBCs”.
- Even the SC/ST/SEBC/OBC members had been treated as a separate category for the purpose of the 50% reservation. Now, they cannot be treated at par with citizens belonging to the general or unreserved category.
- Article 14: Just as equals cannot be treated as unequal’s, unequal’s cannot be treated equally. Treating unequal’s as equals will offend the doctrine of equality in Article 14.

Concerns:

- Existing reservation should not be seen as a “free pass to equal opportunity” for these backward classes, he noted, but as a reparative and compensatory mechanism to level the field for those crippled by social stigmatisation.
- Hostile discrimination: Excluding the SC/ST/OBC/SEBC communities, on the ground that they already enjoy the benefits of a pre-existing 50% reservation based on their caste and class origins, would amount to heaping injustice based on their past disability and struck at the essence of the “Non-Discriminatory Rule” and destroyed the Equality Code of the Constitution.
- Orwellian exclusion: Such an exclusion was simply “Orwellian” as the government’s statistics itself showed that the “bulk of economic deprived section of the society belonged to SC/ST/SEBC/OBC”.
- Narrow scope: The petitioners had argued that the exclusion of SC/ST/SEBC/OBC had left only the “middle class” among the forward castes drawing less than ₹8 lakh as annual family income to reap the benefits of the EWS quota.
- 50% ceiling limit: Permitting the breach of 50% ceiling limit would become “a gateway for further infractions and result in compartmentalisation”.

BPL population: Of the 31.7 crore people living under the poverty line in the country, the classification is as follows:



Way forward:

- Both sides agreed on the state’s power to make special provisions for implementing reservation in private unaided institutions, including professional colleges.
- The Amendment cannot be said to violate Basic Structure by permitting the state to make special provisions in relation to admission to private unaided institutions.

Fake News on social media

Context: Recently, Election Management Bodies (EMBs) expressed their expectation from social media sites to proactively flag fake news.

- For propagating fake news, the Indian government has recently shut down some YouTube news channels and other social media accounts.
- This is the first time action has been taken against Indian YouTube-based news providers since the notification of the new Information Technology (IT) Rules, 2021.
- This reflects the extent of the fake news menace and the threat it poses to the Indian democracy.

What is fake news?



- Fake news is a kind of yellow journalism that comprises intentional misinformation or hoaxes distributed through conventional print, broadcasting news media, or Internet-based social media.
- Fake news is intentionally written in order to gain financially or politically through sensationalist, exaggerated, or false headlines for capturing the attention of the people.

Causes of the spread of fake news:

- Internet: Everyone with an internet connection and a social media presence is now a content generator. Free internet service has provided access to everyone to post whatever they want and hence created a trend of fake news spreading like wildfire.

- Not checking authenticity: Everyone is in a hurry to like/share/comment instead of checking the authenticity of the news.
- Lack of regulator: in social media platforms like we have in print or television media.
- Emotions: are trumping reasons when it comes to sharing news. For example, the idea of nation-building is trumping the truth when it comes to sharing stories that have nationalistic messages like India's progress, Hindu power, and revival of lost Hindu glory without any attempt at fact-checking.

Consequences of fake news:

Political:

- Targeting a specific organization or person with an intent to either glorify or bring malice to it.
- Political parties try to get political benefits by polarizing the voter's mind.
- For example, a news channel was established just to support the accused in Jessica Lal's Murder Case.
- Another example is the extensive use of social media in influencing public opinion in the last US Presidential election.

Economic:



- Hoaxes of GPS chips in the Rs 2,000 note after the demonetization initiative of the government through both media and WhatsApp messages led to widespread confusion among holders of the new note.
- Fake news has also been used to deceive illiterate people financially. Example- Chit fund schemes introduced the concept of online fraud through spam emails.

Society:

- It affects the spirit of common brotherhood and increases intolerance in the country.
- Example: Spreading fake photos to bring about communal clashes in the country/region.
- 2012 mass exodus of North-Eastern people from Bangalore on false online threats.

Security:

- Media companies tend to get easy viewership by means of promoting sensational news.
- For example: branding foreign prisoners as spies or terrorists without valid proof.
- Another example is the fake news circulation in the Kashmir valley showing shocking attacks on the Army and inhumane repression of civilians.

Nation's reputation:

- The portrayal of India as an unsafe place for women by international media has created a false image of the nation.

Personal reputation:

- Fake news results in harassment and threatening of innocent people and damages their reputations.
- It can also result in deaths. For example, rumours about child lifters and cattle thieves led to mob attacks and deaths across India.

Faith in media:

- Fake news reduced people's belief in social, print, and electronic media = affecting the benefits of these media.

Challenges with preventing fake news on social media:

- **User-generated content:** It is unreasonable to put the blame on the social media platforms for the fake news menace.
 - Because the platforms such as Facebook, WhatsApp, etc. are not generating the content, but by the users themselves cannot hold all of them responsible.
 - So rather than forcing a solution on technology providers alone, the centre needs to address the consumer end as well and adopt a collaborative way to tackle the menace of fake news.

- **Privacy rights:** Security requirements should also consider the rights of millions of genuine users as traceability would undermine the end-to-end encryption, and weaken consumer privacy and cybersecurity.
- **Need for high encryption:** Data leaks at Facebook and Uber in the recent past have shown that the encryption has to be so high.
- **The welfare of Indians:** It could actually affect the welfare of Indian digital users.
 - For instance, WhatsApp is crucial for rural people to cheaply connect with their family members far away and also send pictures of their products to clients all over India.
- **Jurisdiction issues:** As WhatsApp users converse outside Indian boundaries, the storage of foreign users' data could come with its own jurisdiction issues.

Tackling fake news on social media:

- **Digital Literacy:** An effective approach to deal with fake news is to improve digital literacy i.e., the ability to identify real news from fake news. Government, media, and technology should work together to improve the overall digital literacy in India.
- **Ombudsman:** should be created to deal with the credibility of news sources and also ensure facts are reported.
- **An Independent agency:** should be established to verify the data being circulated on social and other media.
- **Innovative approaches:**
 - With the utilization of metadata (data about data) and human content moderation, WhatsApp could prevent fake news, and misinformation and even punish bad actors, without breaking end-to-end encryption.
 - When a message is reported and identified as fake, it should be permanently tagged if someone tries to circulate it months later, it should only be transmitted with a statutory warning.
- **Police machinery:** The state police machinery should be strengthened to catch anyone responsible for spreading fake messages.
- **Hefty fines:** Similar to Germany, India should also impose hefty fines on social media companies if they constantly fail to remove illegal content from their platforms.
- **Internal mechanisms:** Print and Electronic media should have an internal ombudsman to verify incidents, facts, and figures.
- **Role of NGOs:** and other civil society organisations in spreading awareness about the ill effects of fake news.
- **Legal remedies to tackle fake news:** Indian Broadcast Foundation (IBF), The Press Council of India, IPC Sections 153A and 295, Broadcasting Content Complaint Council (BCCC), Defamation Suit, The Information Technology (IT) Act, Contempt of Court laws and The Constitution of India.

Way Forward:

- **Policy-makers:** Although the policy-makers' steps and regulations are in the right direction; the existing loopholes need to be filled.
 - All the stakeholders—lawmakers, online intermediaries, and citizens have a collective responsibility to curb fake news.
- **Lawmakers:** While lawmakers can keep amending the laws, the citizens' duty lies to gain awareness about media literacy.
- **Online intermediaries:** On the other hand, tech platforms need to ensure the use of a sophisticated algorithm to present the public with correct, accurate, and truthful information.
- **Citizens:** The responsibility lies equally among the general public to educate with the necessary information to critically analyze information and then make deductive conclusions.

Early Childhood Care and Education (ECCE)

Context: ECCE is enshrined in the Indian Constitution (article 21-A) to provide free and compulsory education for all children up to 14 years of age.

- Yet, its implementation remains tentative for many reasons, primary of which is the absence of a clear government guideline regarding which Ministry is tasked with policymaking and implementation.

Evolution:

- In 1986, the government announced a National Policy of Education (NPE), which viewed ECCE as an important input.
- In 2002, the government passed the 86th Constitutional Amendment, comprising two insertions: Article 21-A which made the Right to Education (RTE) of a child between six to 14 years, a fundamental right; and Article 51A(k) that assigned the “fundamental duty” of educating a child to their parent or guardian.
- Additionally, the old Article 45 was substituted by a new one through the same Constitutional amendment which introduced the concept of ECCE and provided for a directive to the State to bring into effect the mandate of providing ECCE to children up to 6 years of age.
- It is mandated under the Right of Children to Free and Compulsory Education (RTE) Act 2009.
- In 2020 the Ministry of Education (MoE) released the National Education Policy (NEP) 2020, which rekindles the aspirations for ECCE.

RTE Act 2009:

- The Right of Children to Free and Compulsory Education Act 2009 (or the RTE Act) was enacted in 2009 and its primary objective is a verbatim reiteration of the aim of Article 21 of the Constitution.
- It imposed an enforceable duty or legislative mandate upon the respective Central and State governments to provide ECCE under section 11, as provided for under non-enforceable Article 45 of the Constitution.
- The Preamble of the RTE Bill refers to Article 45 as one of the components of the RTE Act.
- In turn, this created a corresponding enforceable right of the citizens to demand ECCE in the law, as a matter of statutory right.

Governing Ministry issues:

- RTE Act provide for rulemaking powers of the Union government as well as the appropriate Ministry for the implementation of the law.
- The Ministries can administer and act only on the subject matters specifically allocated to them.
- The matter of “elementary education” has been allocated to the MoE through the Department of School Education and Literacy.
- However, there is no mention in the Government of India (Allocation of Business) Rules 1961 about the MoE being tasked to provide ECCE.
- It clearly shows that ECCE is not an allocated business of the MoE.
- Indeed, ECCE is a subject matter that relates to the Ministry of Women and Child Development (MoWCD) through the Integrated Child Development Scheme (ICDS) and the deployment of Anganwadi Centres (AWCs) that implements it.

Concerns:

- Multitude of services related to early childhood care (i.e., health, nutrition, and immunisation, among others), the component of education has often been given low priority across the country
- Duplicity: Neither the MoWCD nor the MoE has a clear demarcation of each other’s subject matters and have passed the responsibility of ECCE to the other.
- ECCE in India has long suffered from scarce funding—in 2020-21, the public expenditure on early childhood care and education was a mere 0.1 percent of GDP.

- ICDS is poorly governed and implemented such as deficiency in the number of AWCs and in the infrastructure and skilled workforce of the centres that are striving to remain operational.
- There is no fund allocation to MoWCD specifically for ECCE that requires to be reviewed by CAG.
- Non-recognition of MoWCD's role for ECCE under the RTE Act, no budgetary allocation
- Budgetary allocation for the RTE Act is taken from the Samagra Siksha Scheme –which is an umbrella program for school education extending from pre-school to grade 12 that focuses on school effectiveness, access, and learning outcomes.
- According to MoWCD, ICDS has four pillars: early childhood care education and development; care and nutrition counselling; health services; community mobilisation awareness, advocacy and information; and education and communication.
- The Ministry's own data shows that there has been no significant spending on the first component, i.e. ECCE.
- Failure of the government to implement the letter and spirit of Section 11 of the RTE in relation to ECCE (the Bombay High Court, in Dr. Jagannath S/o Shamrao Patil v. Union of India & Ors)

Suggestions:

NEP 2020 outlines the following strategies:

- strengthening and expansion of AWCs
- co-location of AWCs in primary schools
- co-location of pre-primary grades in existing primary schools
- increased standalone pre-primary schools
- Recognise which Ministry has been allocated to provide for ECCE
- the responsibilities of pre-school education or ECE can be undertaken by the MoE but the overall charge of ECCE should be retained with the MoWCD.
- An important distinction also needs to be clarified between legislation and policy. NEP 2020 is a policy document and mostly directional or aspirational in nature. In order to operationalise the spirit of the policy, legislative changes are needed to both the RTE Act as well as the business conduct rules.
- Recognise and popularise the concept of ECCE being a vital part of the RTE Act including budgetary allocation specifically for ECCE, repeal of overlapping and diverging schemes including SSS as well as ICDS.
- It will create justiciability: i.e., the right of an aggrieved person to approach Court(s) while holding concerned ministry accountable for its inactions, ineffective implementation, and non-compliances in providing ECCE.

Way forward:

- The National Education Policy 2020 has come at the right time and provides a beacon of hope that adequate attention will henceforth be paid to ECCE.
- However, NEP remains essentially an aspirational policy, and not an enforceable legislation.
- For substantive changes to happen in the domain of ECCE, the country's lawmakers need to step up and, first, revisit Section 11 of the RTE Act considering the increased advocacy for ECCE.
- It is also crucial to understand that while ECCE adopts a more holistic approach to the overall development of younger children, the mandate and expertise of delivering education lies with the MoE and not MoWCD.
- This would need to be adequately translated into practice, not just through laws but also through adequate financing and standardised policies.

India's transparency regime

Context:

- India's transparency regime is in trouble as the very institution mandated to guard it (Central Information Commission or CIC) has become responsible for its downfall.

- It had passed orders seeking transparency in many cases of public importance.
- However, the present set of Information Commissioners have together adopted a new jurisprudence that has created additional hurdles in a citizen's quest for accountability.

About Central Information Commission:

- Established under the Right to Information (RTI) Act 2005, it is the apex body under India's transparency regime.
- Its most vital mandate is to decide the disclosure or the non-disclosure of information.
- Citizens can file applications under the Right to Information Act with any public body and are guaranteed a reply from the public information officer of that public body within 30 days.
- Under the RTI Act, when an applicant is denied information by a government department, the first appeal is made to the appellate authority in the department. If unresolved, the RTI applicant can move the office of the Central Information Commission (CIC)—for queries related to central government—or State Information Commission.
- Information Commissioners (ICs) appointed to the CIC are equal in status to the Chief Election Commissioner, and that of a Supreme Court judge; having a a five-year fixed term and terms of service.
- In its current form, Section 8 of the RTI Act lists ten exemptions, ranging from any information that may hurt national security, impede the process of ongoing investigations to cabinet papers and deliberations of the council of ministers.

Challenges to RTI:

- Centre's dominance: After the amendments of 2019, the Centre gave itself powers to change and decide these terms whenever it wished, thereby striking at the independence of the commission and those who man it.
- Lack of public welfare orientation: The CIC has become more like a walking dead institution, where records will show that not a single order for disclosure has been forthcoming in matters of public importance.
- Delay in hearings: Cases at the CIC come up for a hearing roughly after a two year wait. If the matter is not already infructuous or lost its significance, one can look forward to the commission deciding one's case.
- In a case seeking disclosure of documents relating to the making of the Unlawful Activities (Prevention) Amendment Act, 2019, the commission has resorted to keeping the matter pending for final order for more than three months now, something which is unheard of.
- Lack of transparency: In matters of public importance, such as cases seeking disclosure of files related to the national lockdown during COVID-19, or the case seeking disclosure of data pertaining to phone tapping orders passed by the Home Ministry, the Commission has adopted a new way of delegating its mandate — to decide cases — to the Ministry before it.
- Vagueness: In most cases, the Ministries reiterate their stand of non-disclosure, most often under vague grounds of national interest.
- Lack of procedure: The CIC refuses to accept any further challenge to such orders, therefore, refusing to do its duty of deciding the cases.
- One of the cardinal rules of natural justice is that no one should be a judge in their own cause.
- However, the commission now allows, or rather wants, the very Ministry that stands accused of violating the RTI Act to act as the judge in their own cause and decide whether a disclosure is necessary.
- Such as, CIC refused to hear the Internet Freedom Foundation's challenge to the fresh non-disclosure order passed by the Home Ministry in the phone tapping case.
- Ultra-virus actions: In another case related to disclosure of non-performing assets and top defaulters of a co-operative bank, the matter was listed out-of-turn to issue a "stay" order against the Bank's First Appellate Authority's order for disclosure. A stay order is unheard of and there is no provision in the RTI Act for the same.

- High number of vacancies: information commissions are purposely deprived of commissioners to scuttle the effective functioning of the RTI Act.

Suggestions for future:

- **Simplicity:** Unlike court cases, RTI matters do not involve complex legal arguments and are simple to adjudicate.
- **Reduce pendency:** In May 2014, close to 35,000 appeals were pending before the CIC.
 - In June 2019, about 31,000 appeals were pending, over 9,000 of those pending for over a year.
- **Fill vacancy:** Currently, four out of the ten positions of information commissioners are vacant.
 - Several information commissions in the states were either non-functional or working at a reduced capacity.
- **Prune the exemption list:** In an RTI ratings report by the Canada-based Centre for Law and Democracy, India's rank slipped from second position in 2011 to eighth in 2018.
 - It flagged blanket exemptions from the RTI to "security, intelligence, research and economic institutes" and "information held by private entities which perform a public function".
- **Protect whistle-blowers:** In March 2018, Nanji Sondarva was allegedly clubbed to death in Gujarat's Rajkot district after filing an RTI application seeking details of a newly constructed road in his village.
 - 84 RTI activists have been murdered since 2005 for seeking information on illegal construction, alleged scams in social welfare scheme.
- **CIC as a constitutional body:** the RTI is safeguarding a fundamental right guaranteed under the Constitution.
 - Article 19 (1)(a) of the Constitution guarantees freedom of speech and expression to citizens, but without the RTI, one cannot express oneself, including while making an electoral choice.
 - the Supreme Court has also interpreted RTI as a fundamental right—in 1975 and 1982.
- **Political parties under RTI:** Political parties are reluctant to share information with citizens.
 - The CIC classified political parties as a public authority since they benefit from land allotted by the government at cheap rates, free air time with state broadcasters during elections, and are allowed to claim income tax exemptions.

Way forward:

- Citizens must mount intense pressure on authorities to act and appoint commissioners of integrity.
- Lawyers must help willing citizens take matters to court and seek justice.
- If there is a failure to do so, India will lose its cherished right to know.

Amendment to Aadhaar Rules

Context: Recently, the government has amended Aadhaar regulations. The Aadhaar (Enrolment and Update) Regulations have been updated to reflect the changes.

About Aadhaar:

- A 12-digit unique identity for every Indian individual, including children and infants
- Enables identification for every resident Indian.
- Establishes uniqueness of every individual on the basis of demographic and biometric information.
- It is a voluntary service that every resident can avail irrespective of present documentation.
- Each individual will be given a single unique Aadhaar ID number.
- Aadhaar will provide a universal identity infrastructure which can be used by any identity-based application (like ration card, passport, etc.)
- 134 crore Aadhaar numbers have been issued till date.
- Around 1000 government schemes – 650 from state governments and 315 from central government use Aadhaar authentication services to avoid deduplication and removal of ghost beneficiaries.

- Aadhaar enrolment of adult citizens is nearing 100 per cent.

About the new rules:

- **Updating the documents:** As per the regulations earlier, residents who were older than 15 years at the time of enrolment were recommended to update their biometric data every 10 years.
 - The process of updating documents is not mandatory.
- **Ensuring accuracy:** This process will help in ensuring the accuracy of information in the Central Identities Data Repository (CIDR).
- **Demographic information:** The amendment of the Aadhaar regulation is limited to updating demographic information and does not involve biometric data such as fingerprints.

Issues with Aadhar:

- Aadhaar act allows cancellation of Aadhaar number for any reason by the government and citizens have no recourse.
- A Centralized database is a concern because once it is compromised everyone is at risk.
- There is no ID or address verification and there is no means of identifying fakes.
- There is no data protection law in place in India.
- Enrolment software hacks allowed foreign nationals to create Aadhaar numbers thus creating a national security risk.
- UIDAI does not have a monitoring mechanism but only an audit mechanism.
- Data goes to third parties vulnerability increases due to that.

Usage of Aadhaar:

For Governments, Service Agencies:

- UIDAI issues Aadhaar numbers to the residents only after de-duplicating their demographic and biometric attributes against its entire database.
- Aadhaar seeding enables elimination of duplicates under various schemes which leads to substantial savings to the government exchequers.
- It also provides the government with accurate data on the beneficiaries and enables implementation of direct benefit transfer (DBT) programmes. Aadhaar authentication enables the implementing agencies to verify the beneficiaries at the time of service/benefits delivery and also ensures the targeted delivery of benefits to them. All these activities will lead to:-
- **Curbing Leakages through Targeted Delivery:** All social welfare programmes where beneficiaries are required to be confirmed before the service delivery, stand to benefit from UIDAI's authentication services.
 - This will result in curbing leakages and ensuring that services are delivered to the intended beneficiaries only.
 - Examples include subsidized food and kerosene delivery to Public Distribution System (PDS) beneficiaries, worksite attendance of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) beneficiaries, etc.
- **Improving Efficiency and Efficacy:** With the Aadhaar platform providing accurate and transparent information about the service delivery mechanism, government can improve disbursement systems and utilize its scarce development funds more effectively and efficiently.

For Residents

- Aadhaar system provides single source offline/online identity verification across the country for the residents.
- Once residents enroll, they can use their Aadhaar number to authenticate and establish their identity multiple times using electronic means or through offline verification, as the case may be.
- It eliminates the hassle of repeatedly providing supporting identity documents each time a resident wishes to access services, benefits or subsidies.

- Since Aadhaar is universal identity accepted across the whole country, the Aadhaar system enables mobility to millions of people who migrate from one part of the country to another by providing a portable proof of identity that can be verified through Aadhaar authentication on-line anytime, anywhere.

Additional Information:**About Unique Identification Authority of India (UIDAI) & Aadhar****Aadhaar Act & Establishment of UIDAI:**

- The UIDAI is a statutory authority established under the provisions of the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016 (“Aadhaar Act 2016”) by the Government of India, under the Ministry of Electronics and Information Technology (MeitY).

Need of UIDAI:

- UIDAI was created to issue Unique Identification numbers (UID), named as “Aadhaar”, to all residents of India. The UID had to be –
- Robust enough to eliminate duplicate and fake identities, and
- Verifiable and authenticable in an easy, cost-effective way.
- Under the Aadhaar Act 2016, UIDAI is responsible for:
- Aadhaar enrolment and authentication, including operation and management of all stages of Aadhaar life cycle,
- Developing the policy, procedure, and system for issuing Aadhaar numbers to individuals and
- Perform authentication and the security of identity information and authentication records of individuals.

Quasi-Judicial Courts

Context: The functioning of quasi-judicial courts is of paramount importance as they deal with vital land and related issues. Their failure to administer speedy justice leads to harassment of citizens, besides abetting criminal activity by unscrupulous elements.

About Quasi-Judicial Courts:

- A Quasi-Judicial Body is a body, usually of a Public Administrative Agency, that has powers and processes similar to those of a Court of Law or Judge and is required to impartially establish the facts and draw conclusions from them in order to serve as the foundation for an official action.
- According to another definition, a quasi-judicial body is “an organ of government other than a court or legislature, which impacts the rights of private parties either through adjudication or rulemaking.”
- National Human Rights Commission, National Commission for Women, National Commission for Minorities, etc. are examples of quasi-judicial bodies.

Features of Quasi-judicial bodies:

- **Similar to law imposing bodies:** Quasi-Judicial bodies are institutes which have power similar to law imposing bodies but these are not courts. The courts have the power to supervise over all types of disputes but the quasi-judicial bodies are the ones with the powers of imposing law on administrative agencies.
- **Specific purpose:** These are created for specific purpose. For example,
 - **National Human right commission:** National Human Rights Commission is a quasi-judicial body which looks into cases of specifically Human Rights violation. It was established under the Human right act 1993. They can investigate human right abuse and can recommend the steps to be taken.
 - **Election commission:** It is constitutional bodies that mainly function for the conduct, control, supervise the election. It also performs judicial function e.g., determination of disqualification of Member of legislator or examining the violation of model code of conduct.
 - **National river water dispute tribunal:** National River water dispute tribunal has the power to grant the award to share the water among disputing states.
 - **Central administrative tribunal:** This is constituted to look into the matter related to service dispute of civil servants. For example, determination of age of civil servant in case of dispute etc.

- **Other regulatory bodies:** SEBI, TRAI, IRDA etc. are some other quasi-judicial regulatory bodies. Their main function is to ensure transparency in the market economy. They also take judicial measures e.g., punishing in case of violation of rules through fines etc.
- **Nature of bodies:** They can be statutory, regulatory or constitutional in nature. For example, the National Human Rights Commission is a statutory body, while Finance Commission is a constitutional body created under Article 280. Whereas SEBI is a regulatory body which performs judicial functions too.
- **Expertise:** These bodies need not only be headed by a judge rather experts too can be included having sectoral knowledge like Finance, Economics, and Law etc.
- **Judicial review:** Verdict of these bodies can be challenged in a court of law which is the final authority.

Issues associated with the quasi-judicial bodies:

- **Lack of access to electronic platforms:** Computers and video recorders are not available in many of these courts. Only a few states such as Maharashtra, Madhya Pradesh and Rajasthan have electronic platforms for supporting activities such as the filing of cases, publication of cause lists and sending summons.
- **Lack proper knowledge of law and procedures:** Several of the presiding officers lack proper knowledge of law and procedures which has landed many a civil servant in deep trouble in sensitive matters such as those related to arms licences.
- **Understaffed:** The maladies that these agencies suffer from are far graver than judicial set-ups, as they are staffed by revenue authorities who have several other functions. Usually, many of these offices are understaffed.
- **Burdened with duties other than court work:** Their engagement with duties such as law and order, protocol, coordination, and other administrative functions leaves them with much less time for court work. Their access to court clerks and record keepers is limited.
- **Lack of adequate supervision:** The most critical issue faced by these systems is the lack of adequate supervision and ownership by the administrative and political leadership.
- **Lack of compilation of data:** Data on the level of pendency or the speed of disposal is not compiled in many states. This is why there is scarcely any attempt to increase staff strength. There is hardly any public scrutiny say by the press or legislature.

Suggestive measures to improve their functioning:

- **Establishment of Electronic platforms:** An electronic platform should be established to handle all ancillary work related to the administration of justice, such as filing of complaints, issue of summons, movement of case records between courts, issuing copies of the judgments and so on.
 - It could establish a sound basis for analysing the functioning of these bodies and facilitate the publication of statistics.
- **Annual Audit process:** Annual inspections of the subordinate courts should be made mandatory.
 - This should be an important indicator for assessment by the superior authority.
 - The inspections could become the basis of customised training of presiding officers.
- **Efficient functioning:** The government should make the efficient functioning of these agencies a priority and clearly articulate its position on the issue.
- **Detailed data collection and its utilization:** Detailed data on the functioning of these agencies must be collected and published from time to time — at least annually. These should be laid before the concerned legislatures.
 - These results should be the basis of decisions regarding the rationalising of staff strength.
 - If the pendency exceeds a certain threshold, additional officials should be posted to exclusively handle judicial functions. This data should be used to enforce accountability.
- **Interdisciplinary Research:** Interdisciplinary research on the functioning of these courts should be encouraged.

- This would identify the areas of improvement such as legal reforms or issue of clear guidelines.
- **Regular training and orientation:** Regular training and orientation of the adjudicating authorities should be taken up from time to time.
 - If it is possible to deliver customised orientation to the adjudicating officers in their areas of weakness, the benefit is likely to be multiplied.
- **State index of performance:** The state index of performance of these quasi-judicial courts be made and published.
 - It would draw the attention of the states to their performance in comparison to others and help them identify areas of weakness.
- **Compilation of important decisions and guidelines:** Important decisions, guidelines and directions could be compiled and published on the portal of the apex adjudicating forum such as the Board of Revenue. These would be helpful to lower-level agencies.
- **Rigorous Induction Training:** More rigorous induction training of officials handling judicial work would help. Usually, training academies, at the Central or state levels, largely focus on the executive magistrate's courts, rather than on revenue courts.
 - The importance of judicial work should be instilled among the trainees and the skill and confidence in handling them should be developed.
- **Procedural Reforms:** Procedural reforms such as minimising adjournments, mandatory filing of written arguments and other such reforms proposed by bodies like the Law Commission for reform of the Civil Procedure Code should be adopted by these adjudicating bodies.

Way Forward:

- A multi-pronged action plan inclusive of legal, governance and HR reforms is required to move ahead.
- For the ease of living of citizens, it is not only required to ensure the reduction of licences and regulations but also to make adjudication by administrative authorities timely, accessible, and affordable.
- Adjudicating authorities should embrace procedural reforms such reducing adjournments, requiring the submission of written arguments, and other similar improvements suggested by organisations like the Law Commission for revision of the Civil Procedure Code.

As a whole, a quasi-judicial body is a good concept as it reduces the burden on Judiciary but there are some loopholes there in this system also. Govt should choose individuals with both technical and legal knowledge and providing them with power to take decisions will be a booster to this organ of Government.

Global Hunger Index (GHI) and India's malnutrition problems

Context: The Global Hunger Index (GHI) 2022 has brought more unwelcome news for India, as far as its global ranking on a vital indicator of human development is concerned. India ranked 107 out of 121 countries.

- The Government of India attempted to discredit the index immediately in its attempt to deny the findings of the report, even going so far as to term it a conspiracy against India.

About Malnutrition:

- It refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients.
- It is a chronic problem and a longstanding challenge for the public administration of India.
- The term malnutrition addresses 3 broad groups of conditions:
 - **Undernutrition:**
 - It includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age)
 - Together, the stunted and wasted children are considered to be underweight, indicating a lack of proper nutritional intake and inadequate care post-childbirth.
- **Micronutrient-related malnutrition:**

- It includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and
- **Overweight:**
 - It includes obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers).

About Global Hunger Index:

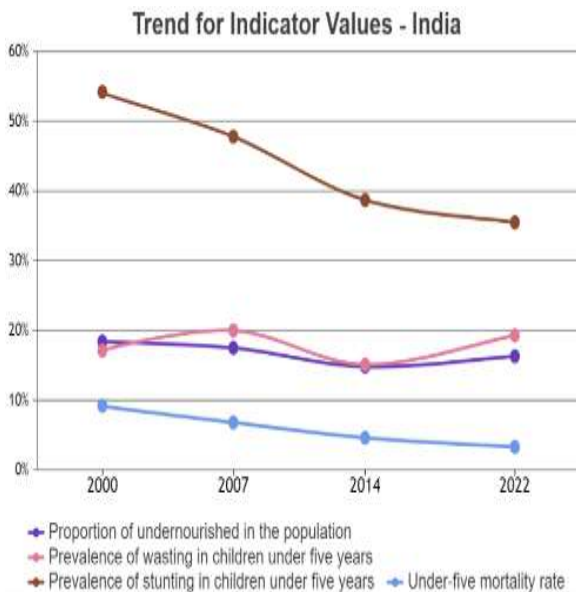


- The GHI is an important indicator of nutrition, particularly among children, as it looks at 4 factors:
 - Child stunting
 - Child wasting
 - Child mortality
 - Undernutrition (caloric deficiency) across the population.

- GHI is a tool for comprehensively measuring and tracking hunger at global, regional, and national levels.
- It is an annual by European NGOs of Concern Worldwide and Welthungerhilfe.

India's performance in GHI 2022:

- India has a score of 29.1 which places it under 'serious' category.
- Among the South Asian countries, India (107) is ranked below Sri Lanka (64), Nepal (81), Bangladesh (84), and Pakistan (99). Afghanistan (109) is the only country in South Asia that performs worse than India on the index.



Issues with addressing the problem of malnutrition:

- **Manpower constraints:** Over 50% Child Development Project Officer (CDPO) posts were vacant in Jharkhand, Assam, Uttar Pradesh, and Rajasthan, pointing to severe manpower constraints in successfully implementing the scheme of such importance.
 - No routine in social audits: Social audits that are meant to allow for community oversight of the quality of services provided in schools are not carried out routinely.
- **Inadequate funding & implementation:** Gaps remain in how the already existing centrally-sponsored schemes are funded and implemented.
 - The budgets being allocated are nowhere near the scale of the funds that are required to improve nutrition in the

country.

- For example, the Saksham Anganwadi and Prime Minister's Overarching Scheme for Holistic Nutrition (POSHAN) 2.0 scheme (which now includes the Integrated Child Development Services (ICDS) scheme), which seeks to work with adolescent girls, pregnant women, nursing mothers and children below three.
- However, the budget for this scheme for FY2022-23 was less than 1% more than the actual spend in FY2020-21.
- **Issues with cash transfers:**
 - Cash transfers seem to be a favoured solution for several social sector interventions in India today, and this includes the health and nutrition sectors.
 - But evidence of the impact of cash transfer on child nutrition in India is limited so far.

- The effect of cash transfers is also limited in a context where food prices are volatile and inflation depletes the value of cash.
- **Social Factors:**
 - Equally, there are social factors such as 'son preference', which sadly continues to be prevalent in India and can influence household-level decisions when responding to the nutrition needs of sons and daughters.
- **Other factors:**
 - Malnutrition persists due to depressed economic conditions in large parts of the country, the poor state of agriculture in India, persistent levels of unsafe sanitation practices, etc.

Measures Taken to Tackle Malnutrition:

- **Poshan Abhiyan:** It is a multi-ministerial convergence mission with the vision to ensure the attainment of malnutrition free India by 2022.
 - The Ministry of Women and Child Development (MWCD) is implementing POSHAN Abhiyaan.
- **Prime Minister's Overarching Scheme for Holistic Nutrition (POSHAN) 2.0 scheme:** It now includes the Integrated Child Development Services (ICDS) scheme, which seeks to work with adolescent girls, pregnant women, nursing mothers and children below three.
- **Integrated Child Development Services:** It represents one of the world's largest and unique programmes for early childhood care and development.
 - The beneficiaries under the Scheme are children in the age group of 0-6 years, pregnant women and lactating mothers.
 - The Ministry of Women and Child Development is the implementing agency.
- **Mid-Day Meal Scheme:** The Mid-day Meal Scheme is a school meal programme in India designed to better the nutritional standing of school-age children
 - It covers all school students studying in Classes 1 to 8 of government schools, government-aided schools, special training centres, including madrasas supported under Samagra Shiksha Abhiyan.
- **National Food Security Mission:** It was launched in 2007-08 by the Ministry of Agriculture and Farmers' Welfare as a Centrally Sponsored Scheme.
 - It focuses on the sustainable increase in the production of targeted crops through area expansion and productivity enhancement.
- **National Nutrition Mission:** It is the government's flagship programme to improve nutritional outcomes for children, pregnant women and lactating mothers.
 - To reduce stunting and wasting by 2 percent per year (total 6 per cent until 2022) among children and anaemia by 3 percent per year (total 9 per cent until 2022) among children, adolescent girls and pregnant women and lactating mothers.
 - The Ministry of Women and Child Development is the nodal ministry for implementation.

Suggestions Measures to Improve Malnutrition in India:

- **Need of a comprehensive programme:** A comprehensive programme targeting adolescent girls is required if the intergenerational nature of malnutrition is to be tackled.
- **Cash transfers:** Cash transfers can also be used to incentivise behavioural change in terms of seeking greater institutional support.
 - Food rations through PDS and special supplements for the target group of pregnant and lactating mothers, and infants and young children, are essential.
- **Fixing the pre-existing schemes:** Fixing the pre-existing schemes is the obvious answer to addressing India's multi-dimensional nutrition challenge.
 - Getting the already existing schemes right requires greater involvement of local government and local community groups in the design and delivery of tailored nutrition interventions.

- **Keeping it a top priority:** The need of the hour is to make addressing child malnutrition the top priority of the government machinery, and all year around.

Electoral Bond Scheme

Context: The government has shelled out Rs 9.53 crore of taxpayers' money towards commission and printing costs of the Electoral Bonds (EBs) issued to fund political parties.

About Electoral Bond Scheme:



- Introduced with the Finance Bill, 2017, the Electoral Bond Scheme was notified on January 29, 2018.
- An Electoral Bond is like a promissory note that may be purchased by a person who is a citizen of India or incorporated or established in India.
- A person being an individual can buy Electoral Bonds, either singly or jointly with other individuals.
- The bonds are like banknotes that are payable to the bearer on demand and are interest-free.
- Only the Political Parties registered under Section 29A of the Representation of the People Act (RPA), 1951 and which secured not less than one percent of the votes polled in the last General Election to the House of the People or the Legislative Assembly of the State, shall be eligible to receive the Electoral Bonds.

Procedure:

- The State Bank of India (SBI) has been authorised to issue and encash Electoral Bonds through its 29 Authorized Branches.
- The bonds are sold by the SBI in denominations of Rs 1,000, Rs 10,000, Rs 1 lakh, Rs 10 lakh and Rs 1 crore.
- One can purchase these bonds only digitally or through cheques.
- The Electoral Bonds can be encashed by an eligible Political Party only through a Bank account with the Authorized Bank.
- The Electoral Bond deposited by an eligible Political Party in its account is credited on the same day.
- Electoral Bonds shall be valid for fifteen calendar days from the date of issue and no payment is being made to any payee Political Party if the Electoral Bond is deposited after expiry of the validity period.

Advantages of Electoral Bonds:

- **Ensures Accountability:** Donations through Electoral Bonds will only be credited in the party bank account disclosed with the ECI.
 - As encashment of all the donations are through banking channels, every political party shall be obliged to explain how the entire sum of money received has been expended.
- **Discouraging Cash:** The Purchase will be possible only through a limited number of notified banks and that too through cheque and digital payments. Cash will not be encouraged.
- **More Transparency:** It helps the political parties to operate in a more transparent manner with the election commission, regulatory authorities and the general public at large.
- **Maintains Anonymity:** The individuals, groups of individuals, NGOs, religious and other trusts are permitted to donate via electoral bonds without disclosing their details. Therefore, the identity of the donor is being preserved.

Criticism of Electoral Bonds:

- **Hindering Right to Know:** Voters will not know which individual, company, or organisation has funded which party, and to what extent. Before the introduction of electoral bonds, political parties had to disclose details of all its donors, who have donated more than Rs 20,000.
 - The change infringes the citizen's 'Right to Know' and makes the political class even more unaccountable.

- **Unauthorized Donations:** In a situation where the contribution received through electoral bonds are not reported, it cannot be ascertained whether the political party has taken any donation in violation of provision under Section 29B of the RPA, 1951 which prohibits the political parties from taking donations from government companies and foreign sources.
- **Leading to Crony-Capitalism:** It could become a convenient channel for businesses to round-trip their cash parked in tax havens to political parties for a favour or advantage granted in return for something. Anonymous funding might lead to infusion of black money.
- **Loopholes:** Corporate Entities may not enjoy the benefit of transparency as they might have to disclose the amount donated to the Registrar of Companies; Electoral bonds eliminate the 7.5% cap on company donations which means even loss making companies can make unlimited donations etc.

Supreme Court's Stance on Electoral Bonds:

- The Supreme Court (SC) agreed that the scheme protects the identity of purchasers of electoral bonds in a cloak of anonymity, but highlighted that such purchases happened only through regular banking channels.
- In 2019, the Supreme Court asked all the political parties to submit details of donations received through electoral bonds to the ECI. It also asked the Finance Ministry to reduce the window of purchasing electoral bonds from 10 days to five days.
- The Election Commission of India (ECI) also told the Supreme Court of India that while it was not against the Electoral Bonds Scheme, it did not approve of anonymous donations made to political parties.

Way Forward:

- It can be said that the release of electoral bonds will restrict the generation of black money up to some extent. But the rule that identity of the donors will be kept confidential may make futile the exercise to eliminate black money, as it may just end up making Black money White.
- The government may reconsider and modify certain provisions of the Electoral Bonds Scheme to ensure full disclosure and transparency. At the same time, the bonds should ensure that the funds being collected by the political parties are accounted for clean money from the appropriate channels without any obligation of give and take.



ECONOMY



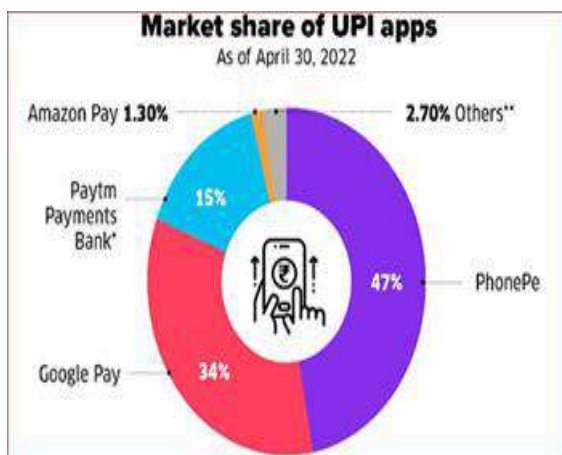
Push for Unified Payments Interface (UPI) enabled payments

Context: Policymakers trying to transition India to a less-cash economy have been confounded by a peculiar phenomenon of currency in circulation growing right alongside rising digital adoption.

About Unified Payments Interface (UPI):

- It is a system that facilitates instant fund transfer between two bank accounts on a mobile platform, without requiring details of the beneficiary's bank account.
- It is an advanced version of Immediate Payment Service (IMPS) round-the-clock funds transfer service to make cashless payments faster, easier and smoother.
- It is developed by National Payment Corporation of India (NPCI) and regulated by RBI.
- NPCI launched UPI with 21 member banks in 2016.
- India is expanding UPI based infrastructure in many foreign countries such as Singapore's PayNow has been linked with UPI.

Importance of UPI:



- With the mushrooming of mobile wallets, QR-based apps and the Unified Payments Interface (UPI), the volume of digital transactions leapfrogged from 293 crore in March 2020 to 799 crore by March 2022, as per RBI data.
- But CIC (currency in circulation) as a proportion of GDP has been rising too.
- After hovering at 11-12 per cent until FY20, it hit 14 per cent in FY21 and remained at 13 per cent in FY22.
- CIC in developed economies tends to be in the single digits.
- But a recent study by SBI Ecowrap offers hope that digital payments may finally be reducing the need for hard cash, in some respects.

- For the first time, the Diwali week this year saw a dip in CIC as opposed to sharp spikes witnessed in the last 20 years.
- The lower need for cash can mainly be traced to the widespread adoption of UPI.

Evolution of UPI:

- UPI has gone a long way in enabling the digitalization of India's payments economy.
- It has added layers of convenience in the way people transact with money.
- UPI being an indigenous 'Made in India' product has helped India find its unique place in the globe in the digital payments arena.
- Likely to be a \$180 billion market by 2026, India is among top nations in this space.
- With UPI expanding beyond the borders, it has certainly brought a lot of pride to the nation.

Significance of UPI enabled payments:

- Low-Cost Source of Funds : UPI's use prompts bank account holders to hold larger balances in their savings accounts, providing banks with a low-cost source of funds.
- UPI manages to materially reduce the need for the public to deal in cash.

- Greater traceability of transactions: Substitution of anonymous cash payments with digital ones also allows for greater traceability of transactions for the taxman looking to widen the tax base.
- Reduce Logistic Costs: If the demand for paper currency diminishes, banks would save on the logistics costs involved in safely storing and transporting paper currency and regularly refilling their ATMs.
- Increasing tax revenue: With digitalization, the market's black money can be diminished, increasing compliance and increasing tax revenue.

Key Issues associated with UPI payment systems:

- High transaction failure rates: Digital payments are currently characterised by high transaction failure rates.
- A Large Number of people left Behind: With options such as mobile wallets, payment apps and QR code readers available only on smartphones, feature phone users who make up roughly half of India's mobile subscriber base have been left behind.
- Many people lack digital literacy: Since most people lack digital literacy, they are unable to use the UPI system.

Way Forward:

- There has to be widespread awareness campaign to educate users about the safe use of UPI and the convenience it brings.
- Digital payment services like UPI were currently used by just a fifth of the population.
- Unless a third adopted it, cash in circulation would not see a durable reduction.
- Despite affluent consumers embracing them in a big way, digital payments are still far from ubiquitous. Policymakers may need to address all the issues to further the reach of digital payments.

Additional Information:

- **Currency in circulation** refers to the amount of cash—in the form of paper notes or coins—within a country that is physically used to conduct transactions between consumers and businesses.
- **Currency in circulation** is all of the money that has been issued by a country's monetary authority, minus cash that has been removed from the system.
- It represents part of the overall money supply, with a portion of the overall supply being stored in checking and savings accounts.

Old Pension vs New Pension Scheme (NPS)

Context: India is a welfare state and thus the welfare of its citizens is its foremost priority. To do so, the government from time to time has taken several steps. The pension system in India is one such initiative that seeks to ensure social and economic justice to the Indian labour force after the end of their working years.

- The pension sector in India not only provides financial support to the beneficiaries but also has a major role to play in the overall welfare of Indian society.

What is the history of Pension in India?

- It was after the Revolt of 1857 that the British introduced the pension system in India which was more or less a reflection of the pension system prevailing in Britain at that time.
- However, the provisions of the plan discouraged the employees from creating a financial cover for their post-retirement life.
- To counter the shortcomings that were present in the prevailing plan, the British came up with the Indian Pension Act, 1871.
- Regular revisions were done following rising prices and the concept of dearness allowance also came into being to satisfy pensioners.
- However, there was no universal social security system as it existed in other countries to protect the elderly or the aged-labour force from economic deprivation.

- It was by the Royal Commission on Civil Establishments in 1881 that the government employees were awarded pension benefits for the first time.
- Further provisions were introduced by the Government of India Acts 1919 and 1935.
- All these schemes were consolidated later on and expanded to provide retirement benefits to the entire working population of the public sector.
- After independence, several provident funds were set up which extended to the private-sector labour force also.
- These include provident funds, gratuity and pension plans.

Their general features are:

- They are mandatory.
- They are occupation-based.
- They are related to one's earning.
- They have embedded insurance cover in case of disability or death.

What is the need for providing pension in India?

- Greater Life Expectancy: With the advancement of technology and healthcare, people would be living more and hence pension support would be required for survival.
- Burgeoning Old Population: As per a recent UN report, the share of older persons in India is projected to increase to nearly 20 per cent in 2050. This calls for giving due protection to them.
- Changing Family Structures: The breakup of joint family system and emergence of nuclear families has increased instances of abandonment of parents by children. In such times, the pension can give hope to survive and reduce the suicide rate among the elderly.
- Prevents Social Crisis: Schemes like Pradhan Mantri Kisan Maan Dhan Yojana (PMKMY) will help small and marginal farmers lead a dignified life in their elderly years by providing due financial support. If such support is not provided, then there would be instances like farmer suicides.
- PMKMY is a pension scheme for small and marginal farmers having cultivable land up to 2 hectares. Farmers within the age group of 18-40 years are eligible to get themselves enrolled in the scheme. It aims at providing an assured pension of 3,000 rupees per month once the farmer attains the age of 60 years.

What are issues with the Pension system?

- Inadequate Coverage: A large part of the Indian population remains uncovered under any pension scheme. Those who remain uncovered usually belong to the unorganised sector.
- Inadequate amounts: For those persons who are covered under various pension schemes, the amount received is very meagre that is not sufficient for their sustenance.
- The Parliamentary Standing Committee on Rural Development observed the meagre amount of assistance under the different components of the National Social Assistance Programme(NSAP). It ranged from 200-500 rupees per month.
- Inequitable Coverage: Furthermore, the benefits net of contributions and implicit rate of returns vary across programs, occupations, sectors etc. and thus the pension covers, in turn, become inequitable.
- Fiscal sustainability: The pension sector adds to the financial strain of the government's fiscal plan. Many studies reveal that the volume of expenses against the payment of pensions is growing at a faster pace than that of the taxes and duties.
- Inefficient Administration: There is criticism regarding the delays in processing and crediting claims and in the issuance of annual statements. Organisational governance structure also needs improvement. Also, there is a lack of portability in retirement benefit systems across different sectors due to government rules and regulations.
- Investment policy: The government instruments where provident funds invest are not freely marketable and thus the rate settings are not market-based. This leads to a low real rate of returns.

- Poor Regulation: A weak regulatory and administrative mechanism is another serious problem that is reflected in the quality of service in the mandatory schemes.
- CAG's Performance Audit Report found that PFRDA did not fix timelines to upload legacy data and transfer of contributions to the Trustee Bank. This affects the timely transfer
- Various ministries implementing pension schemes fail to constitute the Monitoring and Overseeing Committees. This will also result in poor implementation of pension schemes.
- Willingness to adopt: The citizens are not enthusiastic about voluntary pension schemes due to faulty design or lack of financial literacy. As per data on January 2020, no one has registered in the PMLVMY scheme from Mizoram and Lakshadweep.

What was the Old Pension Scheme (OPS) and why was it in news?

- Pension to government employees at the Centre as well as states was fixed at 50 per cent of the last drawn basic pay.
- The attraction of the Old Pension Scheme or 'OPS' lay in its promise of an assured or 'defined' benefit to the retiree. It was hence described as a 'Defined Benefit Scheme'.
- Also, like the salaries of government employees, the monthly pay-outs of pensioners also increased with hikes in dearness allowance or DA announced by the government for serving employees.
- DA — calculated as a percentage of the basic salary — is a kind of adjustment the government offers its employees and pensioners to make up for the steady increase in the cost of living.
- DA hikes are announced twice a year, generally in January and July.
- A 4% DA hike would mean that a retiree with a pension of Rs 5,000 a month would see her monthly income rise to Rs 5,200 a month.
- As on date, the minimum pension paid by the government is Rs 9,000 a month, and the maximum is Rs 62,500.
- However, New Pension System (NPS) came into effect from Jan 2004 to address some of the issues with OPS and usher towards a modern Pension system.
- However, off late Political parties like Congress and AAP are promising to switch to the Old Pension Scheme. Such proposals, driven by short-term political considerations threaten to undo the hard-won policy gains that have been achieved through bipartisan consensus.

What were the concerns with Old Pension Scheme?

- Pension liability remained unfunded: There was no corpus specifically for pension, which would grow continuously and could add burden for government finances.
- Inter-generational equity issues: The present generation had to bear the continuously rising burden of pensioners.
- Unsustainable: Pension liabilities would keep climbing since pensioners' benefits increased every year due to regular DA hikes. Also, better health facilities would increase life expectancy, and increased longevity would mean extended pay-outs.
- Huge Fiscal Burden: In 1990-91, the Centre's pension bill was Rs 3,272 crore, and the outgo for all states put together was Rs 3,131 crore. By 2020-21, the Centre's bill had jumped 58 times to Rs 1,90,886 crore; for states, it had shot up 125 times to Rs 3,86,001 crore. Overall, pension payments by states comprise around 26 per cent of their own tax revenue.
- Bad Politics: Funding a small number of former government employees by utilising a chunk of taxpayers' money cannot be good politics.

What is New Pension Scheme (NPS)?

- The New Pension Scheme (NPS) for Central government employees was notified on December 22, 2003. It was originally conceived for unorganised sector workers, but was adopted by the government for its own employees.

- Unlike some other countries, the NPS was for prospective employees — it was made mandatory for all new recruits joining government service from January 1, 2004.
- The defined contribution comprised 10 per cent of the basic salary and dearness allowance by the employee and a matching contribution by the government — this was Tier 1, with contributions being mandatory.
- On March 21, 2005, the UPA government introduced a Bill in Lok Sabha to give statutory backing to the Pension Fund Regulatory and Development Authority of India (PFRDAI), the regulator for the NPS.
- PFRDAI is the statutory Authority established by an enactment of the Parliament, working under the Ministry of Finance, to regulate, promote and ensure orderly growth of the NPS. It also administers Atal Pension Yojana (APY)
- In January 2019, the government increased its contribution to 14 per cent of the basic salary and dearness allowance.
- Individuals can choose from a range of schemes from low risk to high risk, and pension fund managers promoted by public sector banks and financial institutions, as well as private companies.
- Schemes under the NPS are offered by nine pension fund managers — sponsored by SBI, LIC, UTI, HDFC, ICICI, Kotak Mahindra, Aditya Birla, Tata, and Max.
- Over the last eight years, the NPS has built a robust subscriber base, and its assets under management have increased.
- As on October 31, 2022, the Central government had 23.3 lakh subscribers, states had 59 lakh subscribers, Corporate sector had 15,92,134 subscribers, and the unorganized sector 25,45,771.
- The total assets under management of all these subscribers stood at Rs 7,94,870 crore as on October 31, 2022.

What are the other Pension schemes in India?

National Social Assistance Programme (NSAP): Under NSAP, numerous pension schemes are there for the elderly, widows and disabled. These are:

Indira Gandhi National Old Age Pension Scheme (IGNOAPS)

- It was introduced in 1995 as a part of NSAP.
- It aims at expanding the social safety net for the poor.
- It is a non-contributory scheme and provides a monthly income for citizens or to refugees above 60 years, who have no other source of income.
- Under this scheme, BPL persons aged 60 years or above are entitled to a monthly pension ranging from Rs. 600-1000 depending upon the state government's share of the pension.
- Indira Gandhi National Widow Pension Scheme (IGNWPS)
- The Government of India launched this scheme in February 2009.
- Under this scheme, BPL widows in the age group of 40-64 years are provided with a pension of Rs. 600 per month.

Indira Gandhi National Disability Pension Scheme (IGNDPS)

- It was also launched in February 2009.
- It provides pension to BPL persons with severe or multiple disabilities between the age group of 18-64 years.

Atal Pension Yojana (APY)

- It was launched in 2015.
- It aims at creating a universal social security system for all Indians, especially the poor, the underprivileged and the workers in the unorganised sector.
- It is open to all bank account holders in the age group of 18 to 40 years.
- APY is administered by Pension Fund Regulatory and Development Authority (PFRDA).

PM Kisan Maandhan Pension Scheme (PM-KMY)

- It is an old-age pension scheme for all landholding Small and Marginal Farmers (SMFs) in the country.

- It is effective from the 9th of August, 2019.
- It is a voluntary and contributory pension scheme for the entry age group of 18 to 40 years.
- The Life Insurance Corporation of India (LIC) is the Pension Fund Manager and is responsible for pension pay-out.

Pradhan Mantri Shram Yogi Maan-Dhan Yojna (PM-SYM)

- This is a voluntary and contributory pension scheme.
- It is available to people engaged in the unorganised sector such as rickshaw pullers, street vendors, mid-day meal workers, head loaders, brick kiln workers, cobblers, rag pickers, domestic workers, washermen, home-based, agricultural workers, construction workers or in similar other occupations.
- It seeks to provide old-age protection and social security to the above-mentioned occupational groups.
- The entry age for the beneficiary is 18-40 years and he/she should not be a member of ESIC/EPFO or an income taxpayer.
- The Life Insurance Corporation of India (LIC) is the Fund Manager and is responsible for pension pay-out.

The Electricity (Amendment) Bill 2022

Context: Recently workers in the power sector have threatened an indefinite strike against the passing of the Electricity (Amendment) Bill, 2022. The National Coordination Committee of Electricity Employees and Engineers (NCCOEEE), an umbrella organization of trade unions has held that the Standing Committee has not held any discussions with the workers or the consumers, who are the biggest stakeholders in the sector.

About Key provisions under the Bill: In order to bring reforms in the sector, the Electricity (Amendment) Bill, 2022 was introduced in Lok Sabha on August 8, 2022. The Bill amends the Electricity Act, 2003 which regulates the electricity sector in India. It sets up the Central and State Electricity Regulatory Commissions (CERC and SERCs) to regulate inter-state and intra-state matters.

- **Multiple discoms in the same area:** The Act requires discoms to distribute electricity through their own network. The Bill removes this requirement. It adds that a discoms must provide non-discriminatory open access to its network to all other discoms operating in the same area, on payment of certain charges.
 - The central government may prescribe the criteria for determining the area of supply.
- **Power procurement and tariff:** Upon grant of multiple licenses for the same area, the power and associated costs as per the existing power purchase agreements (PPAs) of the existing discoms will be shared between all discoms.
 - Under the Act, in case of multiple discoms in the same area of supply, the SERC is required to specify the maximum ceiling for a tariff as well as a minimum tariff for such cases.
- **CERC gets licensing powers for multi-state retail supply:** In a major change, the Central Electricity Regulatory Commission (CERC) will now license applicants for distribution in more than one state.
 - Earlier, the licensing distribution was purely SERCs function.
- **Cross-subsidy Balancing Fund:** The Bill adds that upon grant of multiple licenses for the same area, the state government will set up a Cross-subsidy Balancing Fund. Cross-subsidy refers to the arrangement of one consumer category subsidizing the consumption of another consumer category.
 - Any surplus with a distribution licensee on account of cross-subsidy will be deposited into the fund.
- **Payment security:** The Bill provides that electricity will not be scheduled or despatched if adequate payment security is not provided by the discoms.
 - The central government may prescribe rules regarding payment security.
- **Contract enforcement:** The Bill empowers the CERC and SERCs to adjudicate disputes related to the performance of contracts.
 - These refer to contracts related to the sale, purchase, or transmission of electricity.

- **Renewable purchase obligation:** The Act empowers SERCs to specify renewable purchase obligations (RPO) for discoms.
 - The Bill adds that RPO should not be below a minimum percentage prescribed by the central government.
- **Selection committee for SERCs:** Under the Act, the Chairperson of the Central Electricity Authority or the Chairperson of the CERC is one of the members of the selection committee to recommend appointments to the SERCs.
 - Under the Bill, instead of this person, the central government will nominate a member to the selection committee.

Significance of the bill for consumers and suppliers:

- To be able to choose their own power supplier would be a major empowerment for consumers.
- The stipulated 90-day time to regulators for approval or application means regulators can no longer sit on applications for licences.
- Power regulators will set electricity tariffs every year, which will bring in dynamic prices based on emerging situations.
- Regulators being able to implement orders as a decree of the civil court will mean better and more timely compliance.
- The provision to remove regulatory body members for wilful violation/negligence will lead to better implementation of rules and processes.

Major concerns being raised against the bill:

- **Against the federal structure of the Indian Constitution:** By allowing multiple private agencies to distribute power in one place, the amendments will weaken the power of states.
 - The amendments will effectively curb the right of state governments to regulate tariffs and distribution and are against India's federal structure.
 - Despite electricity being on the concurrent list, the Centre gave no time to the states to express their views on the proposed amendments and in the process, the basic tenets of federalism were trampled upon. Adopting its provisions blindly would be against the letter and spirit of the Constitution of India.
- **Huge burden on the State exchequer:** The implications of the bill can put a huge burden on the State exchequer as the cross-subsidising consumers shall move towards private companies offering competitive rates and the subsidised ones shall stay with the government companies. The government discoms will by default go into losses and soon become unable to purchase electricity from generators.
- **Myth of cheaper electricity for consumers:** It is highly unlikely that consumers might be benefitted in case of more than one discoms in competition with the other, as around 80 per cent of the costs sustained by the discoms are directed towards the purchasing power from power generating companies. Thus, according to these statistics, the myth of cheaper electricity for consumers seems to be a far-fetched dream.
- **Centralisation of powers:** The bill, by seeking to make the SERC chairman a nominee of the Union Government, gives a strong impression that the Union Government is trying to control the SERC's appointments.
 - Therefore, the vesting of unlimited powers in the Union Government can have a severe impact on the functioning of regulatory commissions, with them becoming subordinate entities rather than autonomous bodies.
- **Threat of Privatisation:** These amendments will lead to the indiscriminate privatisation of the power distribution sector.

- Multiple Distribution Licensees in an area of supply would lead to “cherry picking” because private players would obviously opt for ‘profitable areas’ leaving the ‘loss-making ones’ to the state Discoms.

Way Forward:

Although the Electricity Amendment Bill, 2022 has brought in several welcome reforms in the sector but the concerns related to the Bill must be addressed. The Bill would help in achieving India’s dream of providing 24*7 electricity to all its citizens, achieving a 5 trillion economy, which in turn achieving sustainable development goals, and fulfilling their obligation of Intended Nationally Determined Contributions (INDC) under the Paris Agreement.



INTERNATIONAL RELATIONS



India's foreign policy

Context: In recent years, there has been an unprecedented change in India's foreign policy. The issues of Masood Azhar, the surgical strike, or the Indo-China tension all involved India's foreign policy holders executing their work effectively.



- India is one of the most ancient civilizations in the world and from ancient times, India's foreign policy remained independent whether it was the Mauryan Empire, the Gupta Empire or the Mughal Empire.
- The British were the determinants of India's foreign policy during the colonial period, who used India for their benefit. But after independence, India's foreign policy is again fulfilling Indian interests.
- Today, India is in selected countries of the world in military

field, space, religious culture etc. and India has used them better in its foreign policy formulation.

Determinants of India's foreign policy:

Geographical factors:

- India occupies a central position in Asia and occupies the largest area in South Asia. In such a situation, any big incident in the whole of Asia affects India.
- The Himalayas are like sentinels of India which play an important role in determining relations with other Himalayan countries such as Nepal, Bhutan, Myanmar.
 - But the desire of China to maintain its dominance in the region continuously since 1962 has a clear impact on India's foreign policy, which has recently shown a change in relations with Nepal.
- Along with this, India has a natural edge in the Indian Ocean. India's dominance over the Indian Ocean is necessary to become an important power of the Indian-Pacific region.

Government System:

- India has a democratic governance system that inspires many countries of the world to accept Indian ideology.
 - for example, ASEAN countries plagued by China look towards India because India's democracy follows the principle of peaceful coexistence.
 - But many times, in the parliamentary system, the role of state governments is also important in determining foreign policy, it becomes more important if there is a coalition government at the centre, as was shown in the Tamil issue in Sri Lanka and the 2005 US Nuclear Deal.

Economic Development:

- Economic sovereignty is of utmost importance in determining foreign policy. Like its policy, India had to open its markets in 1991, but after that India has become very strong financially.
- India's economic growth has attracted many countries. Today, India is an important energy consumer, with countries like Turkmenistan, Iran Russia having economic alliances with India. But still the negative trade balance with China remains India's main problem.

Military power:

- Today India is the third most powerful country in the Army, fourth in the Air Force and sixth in the Navy.

- At the same time, India is rich in nuclear power. Everyone knows India dominance in space. In such a situation, they play an important role in the foreign policy making of India.

Population:

- India is currently the second most populous and youngest country in the world, so India is becoming a consumption-oriented country, in such a situation it will fulfil the need of a big market for all the producing nations, which is the determinant of foreign policy. But with such a large population, problems like hunger, poverty are evident on India's foreign policy.
- Many times, there has been a dispute in the World Trade Union between India and America about the government's intervention in agricultural subsidies.

Culture:

- History and culture can be seen as important in the formulation of India's foreign policy. Kautilya's theory of a powerful kingdom with the ideals of Buddha and Gandhi shows the path of India.
- India's civil-civilian religious relationship is well established from many countries of the world where there are Hindu, Islam, Christian, Buddhist majorities.

Regional Environment:

- Regional events are also important in determining foreign policy. For example, in 1971, the alliance of China, US and Pakistan brought a crisis situation for India, then India got inclined towards Russia.
- At present, the increasing dominance of China is also a reason for intensification of India-US relations. India has increased India's capacity and power with Look East to Act East policies and China's rise in ASEAN.

Global environment:

- After globalization, when the whole world connected with each other, global factors also became important in determining foreign policy. India may oppose the move to withdraw from the Paris Agreement on environment issues, even if there is cooperation between India and America.
- After the Second World War, the world order has changed in many ways, keeping in mind that India tries to reform the UN Security Council.

Panchsheel Principles:

- The Five Principles of Peaceful Coexistence are principles first mentioned in the Sino-Indian Agreement, 1954 and publicly formulated by Zhou Enlai.
- These principles would later become the basis of the Non-Aligned Movement.
- The Panchsheel Agreement was signed by Prime Minister Jawaharlal Nehru and Premier Zhou Enlai.
- These principles, also known as Panchsheel, are listed as
 - Mutual respect for each other's territorial integrity and sovereignty,
 - Mutual non-aggression,
 - Mutual non-interference in each other's internal affairs,
 - Equality and cooperation for mutual benefit, and
 - Peaceful co-existence.

Recent Developments in India's foreign policy:**Key Turning Points in Foreign Policy**

- The Pokhran nuclear tests, the India-China war, and the Galwan Valley clashes were perceived as key turning points in India's foreign policy.

Biggest Inter-state Foreign Policy Challenge

- Border conflicts with China were seen as India's biggest inter-state foreign policy challenge – even surpassing conflicts with Pakistan.
- Terrorism and border conflicts with Pakistan remained important challenges for India's foreign policy.
- The majority of respondents also indicated that India's foreign policy of not engaging with Pakistan benefited regional peace and stability.

India-USA Relationship:

- The USA was seen as the second-most trusted partner since its Independence,
- 85% of respondents thought the USA will be India's leading partner in the next 10 years;
- 83% of respondents also agreed that the USA support will be crucial to India's rise.

Russia-India Relationship:

- Many respondents indicated optimism for Russia, despite its invasion of Ukraine; 43% saw Russia as India's most reliable partner since Independence.
- But many showed their awareness of broader geopolitical changes.
- For instance, an overwhelming majority agreed that India's economic ties with Russia are limited and expressed concerns about strengthening Russia-China ties, and India and Russia drifting away from one another.
- When it came to India's leading partner in the next 10 years, Russia was ranked third, behind the US and Australia.

Indian interests as the driver of foreign policy:

- Indian interests remained the driver for such a perception.
- For instance, Indian youth preferred non-alignment and neutrality if US-China tensions increase.
- But responses changed when Indian interests were at stake: 73% said that India should align with the US to countervail China.

Importance of Regional Power:

- In a multipolar, more uncertain world order, regional powers are growing in importance.
- Quad found limited enthusiasm among respondents but some members such as Australia and Japan enjoyed a significant positive perception.
- Japan was seen as the most important Indo-Pacific partner in the future, followed by Australia.

Strategic Importance to India's neighbourhood:

- Despite India's rising stakes in the new world order, young people attached strategic importance to India's neighbourhood.
- Respondents believed India defined its neighbourhood efficiently and followed an adequate foreign policy across all the sectors – security, trade, and culture.

Way Forward:

- Investing in the South Asia and Indian Ocean Region: There is a need to increase political engagements and infrastructure and connectivity projects across the region. So, India needs to continue investing in South Asia and the Indian Ocean region.
- Multilateralism: It should be India's preferred mode of engagement with other countries. There is a strong urge for multilateral reforms – 91% of respondents supported India's bid for a permanent seat at the United Nations Security Council.

The foreign policy of a country is often driven by popular perception. It is, therefore, important to understand how young people perceive foreign policy goals as they are important stakeholders, an even more critical process in a young nation such as India.

India-ASEAN relations

In News: India and ASEAN countries gave a new vigour to their ties by establishing a comprehensive strategic partnership at the 19th ASEAN-India Summit in Cambodia. This year also marks the 30th anniversary of ASEAN-India relations and is, therefore, being celebrated as the ASEAN-India Friendship Year.

Context:

- India places ASEAN as an important pillar of regional, multilateral global order and supports ASEAN centrality in the evolving architecture in the Indo-Pacific.

- The India-ASEAN joint statement acknowledges deep civilisational linkages, maritime connectivity, and cross-cultural exchanges between the two geographies
- The current focus is on enhancing cooperation in the digital economy, smart agriculture, city-to-city partnerships and strengthening healthcare by increasing collaboration in public health, including in areas of research and development and public health emergency.

Political cooperation:

- Act East Policy 2014 has ASEAN as its core focus and India became a sectoral dialogue partner of ASEAN in 1992.
- Mission to ASEAN 2015 with a dedicated Ambassador to strengthen engagement with ASEAN and ASEAN-centric processes
- Delhi Dialogue hosted by India annually, traditionally inaugurated jointly by India and ASEAN at the Foreign Minister's level, serves as the main Track 1.5 mechanism for our engagement. 12th edition is planned for 2022.
- ASEAN-India Cooperation Fund of \$50 million to support implementation of the ASEAN-India Plans of Action for capacity building initiatives.

Economic cooperation:

- ASEAN is India's fourth largest trading partner
- India's trade with ASEAN stands at US\$ 81.33 billion, which is approx. 10.6% of India's overall trade.
- India's export to ASEAN stands at 11.28% of our total exports
- ASEAN accounting for approximately 18.28% of investment flows into India since 2000.
- The ASEAN-India Free Trade Area has been completed in 2015
- ASEAN India Business Council (AIBC) was set up in 2003 for private sector engagement.

Socio-cultural cooperation:

- Students Exchange Programme, Special Training Course for ASEAN diplomats, Exchange of Parliamentarians, Participation of ASEAN students in the National Children's Science Congress, ASEAN-India Network of Think Tanks, ASEAN-India Eminent Persons Lecture Series, etc
- 2nd edition of the ASEAN-India Workshop on Blue Economy, jointly hosted with the Socialist Republic of Viet Nam, was held on 18 July 2018 in New Delhi.

Challenges to the partnership:

- Russia-Ukraine war has aggravated the tension between China and US with China as primary economic partner and the US as the primary security guarantor.
- A divided house:
- ASEAN grouping remains fractured in its response to the Russian invasion of Ukraine, on managing the US-China contestation, and in dealing with the military junta in Myanmar and China's aggression in the South China Sea.
- ASEAN will lose its relevance if it continues to be a divided house, unable to forge consensus on critical regional and global issues.

Threat to ASEAN's centrality:

- In order to isolate and put pressure on the Myanmar junta, Washington has placed sanctions on the regime as well reached out to the opposition National Unity Government.
- Russia and China have been trying to do the opposite and even supplying weapons to the junta.
- In the midst of this, ASEAN's response has been confusing and muddled.
- The initiative it seems is with outsiders rather than with the region and that is not a great message about ASEAN centrality.

Chinese dominance:

- China's massive economic footprint in the region gives Beijing a distinct advantage.

- China's is the primary trading partner of the region with bilateral trade of around \$880 billion.
- With the US-China confrontation and setback of Covid-19 pandemic, China is now seeking to revive the Belt and Road Initiative (BRI) and has announced several new infrastructures projects in Southeast Asia.
- Beijing has also announced negotiations on ASEAN-China Free Trade Area "Version 3.0."

Suggestions:

- India will have to up its game significantly in order to remain relevant in a part of the world that is viewed as critical to the future stability and prosperity of the Indo-Pacific.
- Trade and connectivity will be critical in order to enhance its profile in the ASEAN region.
- PM Modi announced the Indo-Pacific Oceans Initiative (IPOI) in 2019, aimed at forging partnerships to create a safe, secure, stable, prosperous and sustainable maritime domain with maritime ecology; maritime security; marine resources; capacity building and resource sharing.
- India has also hosted the Special ASEAN-India Foreign Ministers' Meeting (SAIFMM)2 in June 2022.

Way forward:

- ASEAN centrality will have no meaning with a fractured region unable to come to terms with the changing realities around its periphery.
- With a fragmented ASEAN, Indo-Pacific will continue to exude the instability and tensions that the world is trying to come to grips with now.
- This is the age of minilaterals and India should not be shy of exploring them even In Southeast Asia as ASEAN will continue to struggle with its internal cohesion for the foreseeable future.

India – Israel Relations

Context: India and Israel established full diplomatic relations in 1992 and since then the bilateral relationship between the two countries has blossomed at the economic, military, agricultural and political levels.

Diplomatic Relations: India officially recognised Israel in 1950. Soon after, Israel established an immigration office in Bombay which was later converted into a Trade Office and subsequently a Consulate. However full diplomatic relations were established only in 1992 and Embassies were opened.

Defence Cooperation: India imports critical defence technologies from Israel. There are regular exchanges between the armed forces.

- In February 2014, India and Israel signed three important agreements on Mutual Legal Assistance in Criminal Matters, Cooperation in Homeland Security, and Protection of Classified Material.
- There is cooperation on security issues, including a Joint Working Group on Counter-Terrorism.
- Indian armed forces use Israeli Phalcon AWACS (Airborne Warning and Control Systems), Heron drones to Barak anti-missile defence systems.
- The Indian military deployed an Israeli-developed comprehensive integrated border management system (CIBMS) along its border with Pakistan in August 2017.
- At the 15th Joint Working Group (JWG 2021) meeting on Bilateral Defence Cooperation, countries agreed to form a Task Force to formulate a comprehensive Ten-Year Roadmap to identify new areas of cooperation.

Economic and Commercial Relations: The bilateral merchandise trade grew from USD 200 million in 1992 to USD 6.35 billion (excluding defence) during the period 2021-2022, with the balance of trade being in India's favour.

- India is Israel's third-largest trade partner in Asia and seventh largest globally.
- Israeli companies have been instrumental in transferring technology to India in areas like renewable energy, telecom, water technologies. Many of them have also set up R&D centres in India.
- India is also in dialogue with Israel for concluding a Free Trade Agreement (FTA).
- Major exports from India to Israel include precious stones and metals, chemical products, textiles and textile articles, etc.

Cooperation in Agriculture: Under a comprehensive Work Plan for cooperation in agriculture signed on 10 May 2006, bilateral projects are implemented through MASHAV (Centre for International Cooperation of Israel's Ministry of Foreign Affairs) and CINADCO (Centre for International Agricultural Development Cooperation of Israel's Ministry of Agriculture and Rural Development).

- A three year joint work program has been signed between the two countries in 2021 for development in agriculture cooperation.
- It is aimed at establishing Centres of Excellence, intensifying value chains and encouraging private investment.
- Israeli drip irrigation technologies and products are now widely used in India. Some Israeli companies and experts are providing expertise to manage and improve dairy farming in India through their expertise in high milk yield.

Science and Technology: The two countries have established a Joint Committee on Science and Technology, established under the Science and Technology Cooperation Agreement signed in 1993.

- India-Israel Industrial R&D and Technological Innovation Fund (I4F) has been set up to secure cooperation between the Department of Science and Technology (DST), Government of India, and the Israel Innovation Authority, Government of Israel to promote, facilitate and support joint industrial R&D projects.
- It will address the challenges in the agreed 'Focus Sectors'.
- Israel has also offered to assist with India's Clean Ganga Mission by providing its expertise in water management to address water scarcity.

Energy: Tamar and Leviathan gas fields off the coast of Israel were explored recently and India has been one of the first countries to bid for an exploration license in order to extract and import natural gas from the fields.

- India's ONGC Videsh, Bharat Petro Resources, Indian Oil and Oil India were awarded an exploration license by the Israeli government, a clear sign of the ongoing diversification in ties between the two countries.

Indian Diaspora: There are approximately 85,000 Jews of Indian-origin in Israel (with at least one Indian parent), who are all Israeli passport holders.

- The main waves of immigration into Israel from India took place in the fifties and sixties. The majority is from Maharashtra (Bene Israelis) and relatively smaller numbers from Kerala (Cochini Jews) and Kolkata (Baghdadi Jews).
- In recent years some Indian Jews from North Eastern states of India (Bnei Menashe) have been immigrating to Israel.

Reasons for Evolving Engagement:

Both countries have come a long way from policy of estrangement to engagement primarily because of:

- **Kashmir question:** West Asian countries have strongly supported Pakistan on Kashmir issue so Israel came across as the natural partner.
- **Abraham Accord:** Signed in 2020 amongst USA, Israel and UAE to normalise the relations between Israel and the west Asian countries.
- Subsequently, Bahrain, Jordan joined too. The engagement process is still on.
- **Oslo Accords:** The 2 state solution was tried to be achieved with both parties Israel and Palestine signing two subsequent accords in 1993 and 1995 respectively.
 - With direct parties in the conflict coming to peace, India has shed its inhibition of having increasing cooperation with Israel.
- **India's defence requirement:** With the fall of Soviet Russia, it was an imperative for India to diversify its armament supplies. In doing so it found Israel as a natural partner.

Recent Developments:

- UNGA Resolution, 2017: India voted against the recognition of Jerusalem as capital of Israel.

- UNHRC Resolution, 2018: India voted in favour of a resolution condemning use of Israeli forces against the Palestinians.
- UNHRC Resolution, 2021: India abstained from voting in a resolution intended to set up a permanent commission to probe human rights violations in Gaza, West Bank and Palestine.
- Despite India voting against Israel in the UN or abstaining from voting in favour of Israel, both countries have levelled up their engagement since 1992.
- Pegasus row: It is spyware software manufactured by a private Israeli company. The news of Pegasus being used in India created a public uproar.
- Geo-strategic experts are of the view that the row won't affect the India-Israel relationship as it's the consenting governments who buy the software for their internal and external security.

Way Forward:

- India and Israel need to overcome the vulnerability of their religious extremist neighbours and work productively on global issues like climate change, water scarcity, population explosion and food scarcity.
- A more aggressive and proactive Middle Eastern policy is the need of the hour for India to reap the maximum benefit of the geopolitical realignments gradually being brought in by the Abraham Accords.
- **P2P contact:** Despite increasing bonhomie between the two states, the people to people contact still lacks. Increased citizens engagement will give further depth to the relations between the two countries.
- **Bigger trade volumes:** Though the trade volumes between the two countries have been increasing year on year, still it's much below its potential level. FTA should be executed soon and the trade basket must expand.

Though Israel comes across as a natural partner, India should also be concerned about the human rights issues in Palestine. So far, India has been able to balance its geostrategic needs and international morality.



HISTORY AND ART & CULTURE

Sufism in India

Context: In 'In Search of the Divine: Living Histories of Sufism in India', Rana Safvi weaves together a narrative that combines history and geography, myth and contemporary practices of Sufism.

About Sufism in India:

- **Meaning of Sufi:** It literally refers to “the act of wearing wool,” perhaps referring to the shawls worn by the itinerant preachers who travelled the length and breadth of the Middle East, Central Asia and South Asia.
- **Philosophy:** The philosophy of Sufism believes in one God and regards every individual and everything else as part of Him.
 - The Sufi saints preached that ‘**God is one**’, **all is in God**’, ‘nothing is beyond outside Him’ and ‘one can find God by renouncing everything except loving devotion to God.’
- **Sufism in the Indian Subcontinent:** The Sufi movement started in Persia and evolved into a well-developed movement by the 11th century.
 - Sufism found its way into India during the eleventh and twelfth centuries when many Sufi saints came to India particularly in Multan and Lahore of the Indian subcontinent.
- **Bifurcated into Orders:** During this time, the Sufis were organized in orders (silsilahs).
 - The orders were generally led by a prominent mystic who lived in Khanqah (hospice) along with his disciples.
 - The connection between the Pir (teacher) and his murids (disciples) was a vital part of the Sufi system.
 - Every Pir nominated a successor or wali to carry on his work.
- **The Sufi orders are divided into two groups:** Ba-shara, which followed the Islamic Law (shara) and Be-shara, which was not bound by it (shara).
 - Both types of orders prevailed in India, the latter being followed more by wandering saints and qalandars.

Orders of Sufism:

The Sufis organized into several orders or silsilahs. Abul Fazal mentioned fourteen such orders. Some of them became quite popular in India.

The Chisti Order:

- It originated outside India and its founder saint was Khawaja Abdul Chisti.
- In India, it was introduced by Khawaja Muinuddin Chishti and was born in Persia.
- He visited different places of Islamic learning in Central Asia and, finally, reached India in 1200 A.D.
- He settled himself at Ajmer and became very popular all over Northern India.
- Both the Hindus and Muslims paid homage to him.
- The Mughal emperor, Akbar paid homage at his Dargah.
- Among his disciples were Sheikh Hamiduddin of Nagaur and Qutubuddin Bakhtiyar Kaki.
- Shaikh Farid or Baba Farid was also a famous Chisti Saint. He raised the Chisti order to the status of an all-India organization.
- The most famous Chisti Saint was Shaikh Nizamuddin Auliya who was the disciple of Baba Farid.
- He had the chance of watching the reigns of several Sultans of Delhi.
- Amongst his followers was noted writer Amir Khusrau.

- Another famous Saint was Shaikh Nasiruddin Mahmud, popularly known as Nasiruddin Chirag-i-Dilli (The Lamp of Delhi).

Suhrawardi Order:

- Established by Shaikh Shahabuddin Suhrawardi at Baghdad.
- The Suhrawardi order of the Sufis became popular in the North Western part of India.
- The first popular Saint of this order was Shaikh Bahauddin Zakariya who settled down at Multan.
- He led a comfortable life and received wealth and land from his rich disciples.
- He emphasized the external form of Islam.
- He did not believe in fasting, self-mortification etc. with a view to purify souls.
- Shaikh Sharfuddin Yahya Manairi propagated Sufi-doctrines in Bihar. He was a good scholar and compiled several books. He also laid great stress on the services of humanity.

The Qadri Order:

- The Qadrisilalah was popular in Punjab.
- Shaikh Abdul Qadir and his sons were supporters of the Mughals under Akbar.
- The Pirs of this order supported the concept of Wahadat al Wajud (this doctrine postulates that God and His creation are one).
- Among the famous Sufis of this order was Miyan Mir who had enrolled the Mughal Princess Jahanara and her brother Dara Shikoh as his disciples.

Naqshbandi Order:

- The Naqshbandi order of the Sufis was introduced in India by Khwaja Baqi Billah.
- Khawaja Baqi Billah opposed the listening of Sama (religious music) and the practice of pilgrimage to the tombs of saints.
- He opposed interaction with Hindus and Shias.
- He criticised the withdrawal of the Jizyah and the ban on cow slaughter (by Akbar).
- He maintained that the relationship between man and God was that between the slave and the master and not the relation of a lover and beloved.
- He tried to harmonise the doctrines of mysticism and the teachings of Islam.
- His successor was Shaikh Ahmed Sirhindi.
- This order emphasized an observance of the laws of Shariat and denounced all innovations which were added afterwards to Islamic doctrines.

Contribution of the Sufi Movement:

- **Peaceful:** Their efforts were directed towards the creation of a healthy social order free from dissensions, discords and conflicts.
 - Like the Bhakti saints who were engaged in breaking down of barriers within Hinduism, the Sufis too infused a new liberal outlook within Islam.
 - The interaction between early Bhakti and Sufi Ideas laid the foundation of more liberal movements of the fifteenth century.
- **Unity:** The contribution of the Indian Sufis to society lies in their sincere and dedicated struggle to find unity for the heterogeneous elements in the society.
- **Promoted hetero-ethnicity:** They appreciated the multi-racial, multi-religious and multilingual pattern of Indian society.
- **Influence on Hinduism:** Sufism influenced Hindu society and religion.
 - The saints of Bhakti-cult like Kabir, Nanak, Dadu Dayal were certainly influenced by Sufi saints.
 - Many Bhakti saints were influenced by monotheism of Islam.

- Efforts were made by several of them to remove the barriers of caste. Probably, the concept of Guru or the preceptor among the saints of Bhakti Cult was also influenced by the concept of Pir among the Sufis.
- **Helping oppressed:** A notable contribution of Sufis was their service to the poorer and downtrodden sections of society.
 - While the Sultan and Ulema often remained aloof from the day to day problems of the people, the Sufi saints maintained close contact with the common people.
 - Nizamuddin Auliya was famous for distributing gifts amongst the needy irrespective of religion or caste.
- **Brotherhood:** The Sufi movement encouraged equality and brotherhood. In fact, the Islamic emphasis upon equality was respected far more by the Sufis than by the Ulema.

Sufis helped the spread of Islam in India by emphasizing social equality of all the people. Sufis were guides to good life. They bridged the gulf between our societies.

Additional Information:

- The shrine of Baba Fariduddin Ganjshakar (1188-1266) in Pakpattan,
- Khwaja Moinuddin Chishti's (1143-1236) resting place in Ajmer,
- The mausoleum of Hazrat Nizamuddin Auliya (1238-1325) in Delhi, and even as far south as Nagore in present day Tamil Nadu, where Hazrat Syed Shahul Hameed (d. 1570) was welcomed by the king of Thanjavur with a land grant to build a khanqah, or seminary.
- The last named saint is revered as "Nagore Andavar" by locals and is one among thousands of examples where Hindus and Muslims continue to share sacred spaces in India.



GEOGRAPHY



World Heritage Sites Under Threat

Context: Climate change has become one of the most significant threats to World Heritage properties, potentially impacting their Outstanding Universal Value, including their integrity and authenticity, and their potential for economic and social development at the local level.

Case Study: Survival of Mohenjo Daro



- One of the world's first cities came close to being wiped off the map during tragic floods recently in Pakistan.
- Though Mohenjo Daro survived, it has become a symbol of the threat global warming poses to humanity's cultural heritage.
- Built around 3000 BC by the Indus civilization in modern-day South Asia, Mohenjo Daro was not

swept away by the floods, most likely thanks to the genius of its designers.

- Perched high above the Indus River, the city was equipped with a primitive drainage system and sewers, meaning much of the floodwaters could be evacuated.
- Nearly 1,600 Pakistanis died in the floods and 33 million others were affected in a disaster "probably" made worse by global warming, according to World Weather Attribution, a network of researchers.
- The Pakistani site was "a victim" of climate change and was "very lucky" to still be around, exactly 100 years since it was first discovered in 1922.

The impacts of climate change:

Extreme weather and geological events: Of its 1,154 World Heritage sites, "one site in five, and more than a third of natural sites, already see climate change threat as a reality".

Floods: The world is experiencing many more incidents of floods, hurricanes, cyclones, and typhoons. Climate-related disasters are having a significant impact on sites such as Mohenjo-Daro.

Temperature Rise: In Australia, the protected Great Barrier Reef is experiencing bleaching episodes due to rising water temperatures.

High Erosion: In Ghana, erosion has washed away part of Fort Prinzenstein, which is conserved as a notable slave trading post.

Forest fires: Huge forest fires have scorched the Rocky Mountains in Canada, which are a world heritage site, and this year flames came within 15 kilometres (nine miles) of Delphi as a heatwave intensifies the severity of wildfires across the Mediterranean basin.

Landslides: In Peru, meanwhile, landslides occurred this year at the foot of Machu Picchu in the Andes mountains. Recently four people died and one was injured in a landslide that hit three houses in the Tharali area of Uttarakhand's Chamoli district.

Termites and drought: "Slow factors" that do not have an immediate impact pose "new kinds of risks in many of these sites". These include invasions of wood-eating termites in areas that were previously either too dry or too cold for the insects to thrive. In other countries, the drying out of soil due to declining rainfall can have a "destabilizing" effect on some heritage sites. Under drought conditions, "the soils contract and make the

foundations move”, then “swell suddenly when it rains”, which causes cracking. When parched and hard, they absorb less water, which promotes flooding.

Water scarcity: In Mongolia, archaeological sites have been abandoned and then looted because “the population no longer had access to water”. Expected water shortages in the future could also lead to an increase in conflicts in which important heritage sites might be lost.

Impact on Intangible cultural heritage:

- The uprooting of communities due to climate change threatens entire communities and ways of life.
- This includes the practice and transmission of a host of rich intangible cultural heritage practices – from oral traditions to performing arts, social practices, rituals, festive events, traditional craftsmanship, and interactions and relationships with nature.
- For instance, the changing availability of plant and animal species will lead to a loss of ecological knowledge and related language vital for the transmission of living heritage concerning food and medicinal plants.

Roadmap ahead to mitigate climate change: Global Initiatives

There is an urgent need to better understand, monitor, and address climate change threats to world heritage.

Sendai Framework: There is a need to implement a new international approach to managing climate-driven disasters by shifting from a focus on reducing disaster losses to a comprehensive management vision – building on the Sendai Framework for Disaster Risk Reduction 2015–2030.

Early warning: There is a requirement for an early warning system to alert protected area managers of emerging problems.

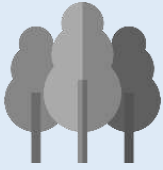
Global assessment of climate risk: A global assessment of climate risk to all World Heritage sites is required so that the most vulnerable sites can be identified and resources for preparedness and resilience can be directed to the most at-risk sites.

Sustainable Development Goals: Target 11.4 of the SDGs calls for “strengthening efforts to protect and safeguard the world’s cultural and natural heritage” and directly reflects the World Heritage Convention, which was the first international treaty to link these two elements.

Paris Agreement: In the Paris Agreement, the new emphasis on preventing deforestation will increase the importance of forest conservation efforts in World Heritage sites, their buffer zones, and surrounding areas.

Reductions in fossil fuel use: It will have the added benefit of reducing the number of World Heritage sites threatened by oil and gas exploration and development.

Further monitoring is required to better understand the effects of climate change on heritage sites and other natural hazards. The study has identified areas with urgent need for adaptation planning. The iconic nature of such sites can be used to promote awareness of the need to take action to mitigate climate change.



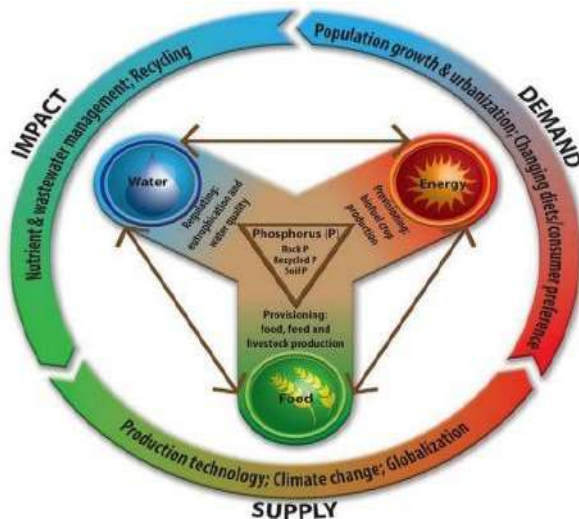
ENVIRONMENT



The Technology and the Water Conservation

Context: With increasing urbanisation and dwindling of natural resources, it has become very important to increase the water sector's sustainability and resilience i.e., being water smart, creating more with what we have, and wasting less.

- Innovation and emerging technology in all spheres must be utilised for ensuring water efficiency, safety, quality, and access.



Water Insecurity As A Real Challenge To Human And Environmental Security:

- Although access to clean water is one of the largest hurdles, insecurity also stems from a range of issues, including dwindling groundwater, stress on water bodies, unsustainable development and theft, amongst others.
- Changes in the climate and ecosystems are added causes and effects of water insecurity.
- About a third of the global population lives without access to clean water and the United Nations' Sustainable Development Goals for 2030 set a high bar to ensure safe and affordable drinking water for all by the end of the decade.
- It will not be easy, especially in Asia, where approximately 300 million people in the region do not have access to safe drinking water, and close to 80 percent of wastewater generated by cities is discharged untreated into water bodies.
- These goals can be met through a better understanding of how water plays a pivotal role not only in human, food, and health security, but also in protecting ecosystems, growth ambitions, energy needs, and mitigating climate change.

Technology in the aid of growing water insecurity:

- The emerging technology and the evolution of the fourth industrial revolution can aid the growing water insecurity if the world is cognizant of following two key aspects:
 - Overdependence on technology cannot and should not replace human responsibility on how water is seen, understood and used as there is no substitute for education to ensure that the world is no longer wasteful.
 - Ensuring any emerging technology, innovation, and science is used mindfully with smart policies and global governance systems in place that provides security as well as safeguarding the water itself.
- Emerging technology can be effectively utilised and optimised to make access to water and managing water systems more efficiently while aiding in smarter predictions and forecasting.
- There are numerous ways to harness technology, innovation, and the drive to create and aid water solutions that can ultimately also prevent conflict over shared resources.
- From space to smart infra, science has proven that efficiency is possible.
- From low-cost desalination to hand-held purifying filters, technology has revolutionised access to clean drinking water and improved livelihoods across the globe.

- Technology has also aided in enabling better infrastructure, reducing loss, and creating a more secure environment.
- AI and machine learning can map and predict potential risks, and early warning tools can aid in tracking water supplies, the effects of changes in the weather patterns, and potential disruptions that can occur.

Industrial Revolution 4.0 and management of water resources:

- The emerging fourth industrial revolution offers untapped possibilities on understanding water.
- In 2021, a joint satellite mission between NASA and France, the Surface Ocean Topography Mission, was launched to use radar technology to provide a global survey of Earth's water.
- The satellite will study lakes, rivers, reservoirs, and the oceans, potentially adding a wealth of knowledge to previously unknown data to understand, measure, and manage our water resources.
- Such knowledge is not only about understanding the waters better, but it is also incredibly useful in understanding the effects of development on resources and the more nuanced effects of changes in weather and climate, ultimately feeding into better policy making.

Case Study of Smart Metering:

- It uses IoT sensors installed at critical junctures along infrastructure to alert users on water levels, quality, theft, and leakages.
- Primarily used in large scale systems, these can be introduced at the household and community level, including new housing complexes that are being built in growing cities across India.
- Not only can such a system create better awareness and understanding on domestic use patterns to allow for better policy making, it also ensures that the citizen has a role and responsibility in the sustainability of water cycles.

Management of water resources with cutting edge innovations:

- Innovation in this space is countless, from water ATMs to fit-for-purpose wastewater solutions to underwater drones with sensors for pipes and drains.
- In Bhubaneswar, researchers at the Council of Scientific and Industrial Research are using burnt red clay to treat raw water and make it potable; and in central India, low cost fit-for-purpose wastewater solutions developed by ECOSOFTT are being used to treat pollution in the Narmada River.

Challenges:

- There are limitations and challenges to the extensive use of technology including:
 - regulatory frameworks
 - lack of skill
 - the inability of existing infrastructure to support such innovation
 - financial obstacles
 - high energy consumption
- New environmental and water-related technology and the use of AI or machines are met with suspicion and are seen as a challenge to cultural traditions, especially if local communities are not suitably sensitised.
- There are added risks that come with the use of technology, such as cyberattacks that are used as threats on critical infrastructure, utilities and businesses, affecting consumers and causing significant financial loss.
- 'Hactivism' is a growing concern and interconnected grids, dams, treatment plants, and other infrastructures all become vulnerable.

Way Forward:

- As the dangerous trio of climate change, unsustainable development, and dwindling water resources hinder human and environmental security, the trio of science, emerging technology, and innovation need to be brought closer together in the water sector.
- Better public-private partnerships with substantial investment allows for targeted forecasting and tools that can predict potential conflict zones.

- A transformation in thought, analysis, and implementation is necessary to be able to counter known and, more importantly, some of the unknown risks and effects of a warming planet.
- A wider approach is needed with upgraded infrastructure, a range of new technical skills, new governance frameworks, education, and effective management.
- These are not insurmountable challenges and can be overcome through political will, forward-looking institutions and policies, and significant public-private partnerships.

Working with companies and people that bring the best of innovation in technology, artificial intelligence (AI), the internet of things (IoT), robotics, and new frontiers in computing can help in better management of the growing water insecurity. However, with the merging and blurring of these two spaces, the extent of the world's dependency on technology should not distract from behaviour and patterns of use.

World's Biosphere Footprint

Context: Since from 2022, November 3 is celebrated as 'The International Day for Biosphere Reserves'.

About World Network of Biosphere Reserves:

- The UNESCO World Network of Biosphere Reserves (WNBR) was formed in 1971.
- WNBR covers internationally designated protected areas, known as biosphere reserves, which are meant to demonstrate a balanced relationship between people and nature (e.g., encourage sustainable development).
- They are created under the Man and the Biosphere Programme (MAB).
- All biosphere reserves are internationally recognised sites on land, at the coast, or in the oceans.

There are 738 biosphere reserves in 134 countries, including 22 transboundary sites. They are distributed as follows:

- 90 sites in 33 countries in Africa
- 36 sites in 14 countries in the Arab States
- 172 sites in 24 countries in Asia and the Pacific
- 308 sites in 41 countries in Europe and North America
- 132 sites in 22 countries Latin America and the Caribbean.

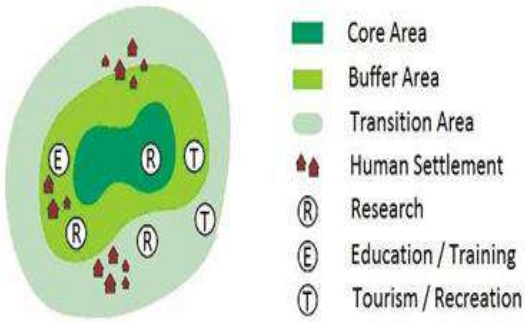
Nomination & approval of biosphere reserves:

- Governments alone decide which areas to nominate.
- Before approval by UNESCO, the sites are externally examined.
- If approved, they will be managed based on a plan, reinforced by credibility checks while remaining under the sovereignty of their national government.

Functions of Biosphere Reserves:

- Biosphere Reserves involve local communities and all interested stakeholders in planning and management. They integrate three main "functions":
- Conservation of biodiversity and cultural diversity
- Economic development that is socio-culturally and environmentally sustainable
- Logistic support, underpinning development through research, monitoring, education and training.

Structure of Biosphere Reserve:



They are demarcated into the following 3 interrelated zones:

Core Zone:

- Includes protected areas, as they act as reference points on the natural state of the ecosystems represented by the biosphere reserves. Have endemic species of plants & animals.
- A core zone is a protected region, like a National Park or Sanctuary/protected/regulated mostly under the Wildlife (Protection) Act, 1972.
- It is kept free from human interference.

Buffer Zone:

- The buffer zone surrounds the core zone and its activities are managed in this area in ways that help in the protection of the core zone in its natural condition.
- It includes restoration, limited tourism, fishing, grazing, etc; which are permitted to reduce its effect on the core zone.
- Research and educational activities are to be encouraged.

Transition Zone:

- It is the outermost part of the biosphere reserve. It is the zone of cooperation where human ventures and conservation are done in harmony.
- It includes settlements, croplands, managed forests and areas for intensive recreation and other economic uses characteristics of the region.

Biosphere Reserves in India:



Need for expansion:

- According to the Global Assessment Report on Biodiversity and Ecosystem Services released in 2019 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the main global drivers of biodiversity loss are:
 - Climate change,
 - Invasive species,
 - Over-exploitation of natural resources,
 - Pollution and
 - The ecological carrying capacity of planet earth has largely been exceeded because of our collective excesses.
- Therefore, the need was felt to address this trend with cleaner air, high-quality drinking water, and enough food and healthy habitats to

ensure that ecosystem services continue to benefit humanity without critically affecting nature's balance.

Way Forward:

- The 'South and Central Asia MAB Reserve' Networking Meeting (where MAB stands Man and the Biosphere) is planned for 2023, to advance biosphere reserve establishment and management.
- In addition, an expert mission has been planned for spring 2023 — to Bhutan, India's north-east and the Sundarbans in Bangladesh.

With at least one biosphere reserve per country in Bangladesh, Bhutan and Nepal until 2025 (with additional biosphere reserves in India's North-East and along the coasts) it will give realisation to millions of people that a better future is truly possible — one where we will truly live in harmony with nature.

Arctic fires could release catastrophic amounts of CO₂

Context: The recent fires in Siberia have spewed some 150 million tonnes of carbon into the atmosphere. Global warming is responsible for bigger and bigger fires in Siberia, and in the decades ahead they could release huge amounts of carbon now trapped in the soil, says a recently released report in Science journal (November 2022).

Findings of the report:

- In 2019 and 2020, fires in this remote part of the world destroyed a surface area equivalent to nearly half of that which burned in the previous 40 years, said this study.
 - These recent fires themselves have spewed some 150 million tonnes of carbon into the atmosphere, the scientists estimate, contributing to global warming in what researchers call a feedback loop (a vicious cycle of carbon emission and global warming).
- The area above the Arctic circle heats up four times faster than the rest of the planet and "it is this climate amplification which causes abnormal fire activity," reports the study.
- Researchers concentrated on an area five and a half times the size of France and with satellite pictures observed the surface area burned each year from 1982 to 2020.
- In 2020, fire charred more than 2.5 million hectares (6.2 million acres) of land and released, in CO₂ equivalent, as much as that emitted by Spain in one year, the scientists concluded.
 - That year, summer in Siberia was on average three times hotter than it was in 1980. The Russian city of Verkhoyansk hit 38 degrees Celsius in summer, a record for the Arctic.

About Polar amplification:

- Polar amplification happens when changes to the earth's atmosphere lead to a larger difference in temperature near the north and south poles than to the rest of the world.
- This phenomenon is measured against the average temperature change of the planet.
- These changes are more pronounced at the northern latitudes and are known as the Arctic amplification.
- It occurs when the atmosphere's net radiation balance is affected by an increase in greenhouse gases (GHGs) .

Reasons for Polar Amplification:

- The ice-albedo feedback, lapse rate feedback, water vapour feedback (Change in Water Vapour amplify or weaken temperature range) and ocean heat transport are the primary causes.
- Sea ice and snow have high albedo (measure of reflectivity of the surface), implying that they are capable of reflecting most of the solar radiation as opposed to water and land.
- As the sea ice melts, the oceans surrounding poles will be more capable of absorbing solar radiation, thereby driving the amplification.
- The lapse rate or the rate at which the temperature drops with elevation decreases with warming.

The consequences of Arctic Warming/ Polar Amplification: Glacial retreat, Thinning of Ice Sheet, Rise in Sea Level.

- **Impact on Biodiversity:** The warming of the poles and the seas in the region, the acidification of water, changes in the salinity levels, is impacting biodiversity, including the marine species and the dependent species.
- **Thawing of Permafrost:** it releases carbon and methane which are among the major greenhouse gases responsible for global warming.
 - Experts fear that the thaw and the melt will also release the long-dormant bacteria and viruses that were trapped in the permafrost and can potentially give rise to diseases.
 - The best-known example of this is the permafrost thaw leading to an anthrax outbreak in Siberia in 2016, where nearly 2,00,000 reindeer succumbed.

Source of Permafrost:

- Arctic soils store huge amounts of organic carbon, much of it in peatlands. This is often frozen or marshy, but climate warming thaws and dries peatland soil, making large Arctic fires more likely.
- Fire damages frozen soil called permafrost, which releases even more carbon. In some cases, it has been trapped in ice for centuries or more. This means that carbon sinks are transformed into sources of carbon.
- An elevated amount of CO₂ was released in 2020 but things “could be even more catastrophic than that in the future,” said the report.
- Higher temperatures have a variety of effects: more water vapor in the atmosphere, which causes more storms and thus more fire-sparking lightning. And vegetation grows more, providing more fuel for fire, but it also breathes more, which dries things out.

Way forward:

- UN Secretary-General warned recently that the planet is heading towards irreversible “climate chaos” and urged global leaders at the upcoming climate summit in Egypt (UNFCCC COP 27) to put the world back on track to cut emissions, keep promises on climate financing and help developing countries speed their transition to renewable energy.
- Indian Environment Minister says that clarity will be sought on climate finance and technology transfer from developed countries, while more support would be offered to developing countries.
- Our climate crisis is intertwined with other complex issues. This means that we must insist on multi-pronged, interconnected climate solutions.
- Forests are at the intersection of the climate change crisis and the biodiversity crisis. Forests, which are home to 80% of terrestrial wildlife, also absorb a net 7.6 billion metric tonnes of CO₂ a year.
- A new study has found that their biophysical aspects tend to cool the earth by an additional 0.5%. The conservation of forests, along with other nature-based solutions, can provide up to 37% of the emissions reductions needed to tackle climate change.
- Hence, we need a forest-led climate action plan to prevent frequent forest fires caused by climate change and global warming.
- Climate change and related extreme weather events like forest fires, work in feedback loops that need to be broken. For this, we need concerted efforts by government, business sector, civil societies, NGOs and individuals.

Green Cess/Clean Environment Cess (CEC)

Context: The government of India has made a climate pledge to reduce emissions to GDP ratio by 45 per cent by 2030 compared to 2005 levels under the Paris Agreement.

About Green Cess: A Green cess is a form of tax levied by the government with the purpose of environment conservation.

- The revenue collected through such cess is used to create green energy infrastructure, combating environmental pollution, afforestation and other such purposes which help in conserving the environment.

- In India, many state governments such as Goa and Gujarat have provision of green tax or cess.
- Ministry of Road Transport and Highways (MoRTH) had introduced a similar tax called as Green Tax / Eco Tax.

About CEC: The Clean Environment Cess (CEC) was a tax introduced in 2010 as a fiscal tool to reduce the use of coal and associated carbon emissions.

- The revenues were earmarked for financing and promoting clean environment initiatives.
- It was levied on the total sales of all types of coal in India.
- To manage the funds accrued under the CEC, the National Clean Energy & Environment Fund (NCEEF) was created in 2010.
- The funds were hypothecated for environmental goals such as rejuvenation of rivers, afforestation, and promotion of renewable energy generation through research and development.
- Despite these intentions of levying the cess, its design and implementation have been inadequate.

Challenges associated with the implementation of the CEC:

The grade factor: The design of the CEC, which levies the cess in proportion to only the quantum of coal (at ₹400/tonne), without differentiating by its grade. It does not give an incentive to switch to higher quality coal with lower levels of pollution.

Diversion of funds: This cess was subsumed into the Goods and Services Tax (GST) compensation cess in 2017. The revenues, which were originally earmarked for environmental conservation, were instead used for compensating States for their loss of revenues. Funds designated for clean energy and environment initiatives are now at the discretion of the States to determine where their revenues from the GST compensation cess are being spent. This calls for an immediate review and also highlights the inefficiencies of the government's fiscal operations and the reduced attention given to promoting clean environment schemes.

Under spent funds for intended purpose: The data on revenue utilisation indicate that only 18 per cent of the aggregated revenue collected between 2010-11 and 2017-18 was used for its intended purpose. This again points out the inefficiency of the government in using the revenue of a cess for its earmarked purposes.

Inadequacy collection of revenues: There is an inadequacy by the government in collecting the revenues owed from the CEC. The difference between the prescribed rate and the actual rate of collection has widened since 2013-14 (see graph). While the rate of this cess was ₹200/tonne and ₹400/tonne in 2015-16 and 2016-17, the actual collection rate per tonne of coal was only ₹144 and ₹324, correspondingly. The gap of ₹56 and ₹76 per tonne of coal sold in India led to an estimated revenue loss of around ₹4,900 crore and ₹6,700 crore, respectively.

The effect on the emissions reduction is meagre: Despite the doubling of the rate of CEC from ₹200 to ₹400/tonne in 2016-17, the modelling experiment showed that the effect on the emissions reduction was meagre.

- The emissions from the burning of the coal and petroleum products in various industries decreased by only 0.90 per cent in total.
- Also, doubling of the cess had a marginal impact on the GDP, with a reduction of 0.09 per cent.
- The emissions intensity of the economy thus reduced by just 0.81 per cent, compared to the effective 20 per cent tax imposed on the price of coal.
- This shows that the cess was not very useful in reducing the emissions intensity in India vis-à-vis its high tax rate.

Way Forward:

- The government must introduce a graded form of an ecological tax that is levied on the value of outputs of sectors such as coal, electricity, fertilisers, iron and steel, non-ferrous basic metals, paper products, and textile industries.
- It will help broaden the tax because in contrast to the CEC, which was levied on the sale of coal, and coal is not as polluting as these sectors.

- The proceeds from such taxes must be used in an ecological sensitive manner by sticking to the desired objectives of promoting clean environment projects and meeting the country's climate change mitigation targets.
- There are industries other than coal which are more polluting, which not only release air pollution, but also have adverse impacts of water pollution and land degradation.

Thus, a tax on the industrial outputs, and not necessarily on their emissions may help India provide industries a proper incentive to move away from polluting forms of production to cleaner mechanisms.

India's Long-Term Low Emission Development Strategy

Context: Recently India submitted its Long-Term Low Emission Development Strategy to the United Nations Framework Convention on Climate Change (UNFCCC) at the 27th Conference of Parties (COP27) which was held in Sharm-el-Sheikh, Egypt.



About 27th Conference of Parties (CoP27):

- Conference of Parties(COP) is the supreme decision-making body of the UNFCCC.
- The agreement seeks to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industry levels.
- COP27 was labelled as an “implementation” conference, in the sense that countries were determined to solve outstanding questions on climate finance.
- This refers to money that developed countries had committed to developing countries to help them turn their economies away from fossil fuels, build resilient infrastructure to climate shocks and access technologies to enable widespread use of renewable energy.

About Long-Term Low Emissions Development Strategy:

- The 2015 Paris Agreement requires all parties to create a long-term low greenhouse gas emissions development strategies (LT-LEDS) based on their various responsibilities and capabilities as per the different national-level circumstances.
- The COP26, held in Glasgow in November 2021, required the parties who have not yet communicated their LT-LEDS to submit them by COP27.
- India's LT-LEDS was prepared after extensive consultations with various government entities, state governments, research institutes and civil society organizations.

Key Pillars of the India's strategy: The 7 key pillars of the strategy are

- Low-carbon electricity systems consistent with development
- Integrated, efficient and inclusive low-carbon transport systems,
- Energy and material-efficiency in buildings,
- Decoupling growth from emissions and developing an efficient, low-emission industrial system,
- CO2 removal and related engineering solutions,
- Enhancing forest cover consistent with socioeconomic and ecological considerations
- Increasing climate resilience in poverty eradication and employment creation.

Salient features of India's (LT-LEDS):

- **Forest Cover:** India has a strong record of enhancing forest and tree cover in the last three decades alongside high economic growth.
 - India's forest fire incidence is well below global levels, while its forest and tree cover are a net sink absorbing 15% of CO₂ emissions in 2016.
 - India is on track to fulfilling its NDC commitment of 2.5 to 3 billion tonnes of additional carbon sequestration in forest and tree cover by 2030.
- **Transition from fossil fuels:** The transition from fossil fuels will be undertaken in a just, smooth, sustainable and all-inclusive manner.
- **Transportation sector:** Increased use of biofuels, especially ethanol blending in petrol, the drive to increase electric vehicle penetration and the increased use of green hydrogen fuel is expected to drive the low carbon development of the transport sector.
- **Sustainable Urbanization:** Future sustainable and climate-resilient urban development will be driven by smart city initiatives, integrated planning of cities, effective green building codes and rapid developments in innovative solid and liquid waste management.
- **Industrial Sector:** India's industrial sector will continue on a strong growth path in the perspective of 'Atma Nirbhar Bharat' and 'Make in India'.
 - The focus will be on improving energy efficiency by initiatives such as Perform, Achieve and Trade (PAT) scheme, high levels of electrification, enhancing material efficiency and recycling leading to the expansion of the circular economy.
- **Transition to low-carbon development:** The transition to the low carbon development pathway will entail several costs pertaining to the development of new technologies, new infrastructure, and other transaction costs.
 - The provision of climate finance by developed countries will play a very significant role in this.

India's NDCs:

- The NDCs, which India must periodically update, are voluntary commitments by countries to reduce emissions by a fixed number relative to a date in the past to achieve the long-term goal of climate agreements of preventing global temperature rising beyond 1.5°C or 2°C by the end of the century.
- Thus, India's most updated NDC commits to ensuring that half its electricity is derived from non-fossil fuel sources by 2030 and reducing the emissions intensity by 45% below 2005 levels by 2030.
- They are concrete targets unlike the low-carbon strategy which is qualitative and describes a pathway.

Issues associated with climate resilient strategies:

- **Funding:** Of nearly \$100 billion annually committed in 2009, which was to have been arranged for by 2020, less than a third has come in.
 - Much of this, and this has been pointed out by several countries including India, is in the form of loans or come with conditions that increase the economic burden on developing countries.
- **Clear delivery:** There is a demand that developed countries must come up with a new target, described in negotiations as a New Collective Quantified Goal, with a clear path of delivery and a higher amount, to the tune of "trillions of dollars" to account for increased costs of energy transition.
- **Loss and Damage:** This is a proposal to compensate the most vulnerable countries and developing countries who are facing the brunt of climate change for the damage that has already incurred.
 - The European Union was resistant to announcing a fund this year, on the grounds that it would take years to materialise and there were other options to get money flowing where it was most needed.
- **Action plans falling short:** It's been at least two-and-a-half decades since the world decided to restrain its greenhouse gas emissions.

- Latest assessments suggest that current action plans of countries to meet climate goals are falling woefully short.
- **Rising emissions:** In absolute terms, the annual global emissions are still rising, now touching almost 50 billion tonnes of carbon dioxide equivalent.
 - In the decade between 2010 and 2019, the global emissions grew by over one percent on average.
 - This is significantly slower than the growth in the previous decade, of about 2.6 percent, but for meeting climate targets, it is not good enough.
- **Ukraine war:** The energy and economic crisis caused by the Ukraine war is threatening to undo even the small gains made.
- **Inadequate & unfair response:** The response in terms of emission cuts has been inadequate.
- **The rich and industrialised countries:** These were the main polluters and hence mainly responsible to bring down emissions, have not met their collective targets.
- **Developing countries:** Countries like China or India, which were not major emitters till sometime back, have seen their emissions rise steeply.

Global picture:

- **EU:** As a bloc, the European Union has done relatively better on climate goals, with the United Kingdom, which is struggling with an economic downturn right now, halving its emissions from 1990 levels, UN data shows.
- **USA:** The United States, the world's leading emitter until it was overtaken by China in the mid-2000s, has been a major laggard, cutting its emissions by only about 7 percent from 1990 levels.
- **India & China:** China's emissions have risen by almost four times, and India's by about three times, during this period.

Way Forward:

- Climate change is a global problem and it requires cooperation between all nations along with adopting rules that are fair and just, for the poor and the rich alike.
- Science is clear that humans are responsible for the global temperature rise and that this increase will lead to more and more variable and extreme weather events, much like what we are seeing now.
- it is possible to estimate each country's responsibility for the stock of emissions already in the atmosphere — the historical cumulative emissions that have "forced" climate change impacts.
- Countries that have not yet contributed to the emissions will do so in the future, simply because the world has reneged on the need to make global rules that would apply fairly to all.

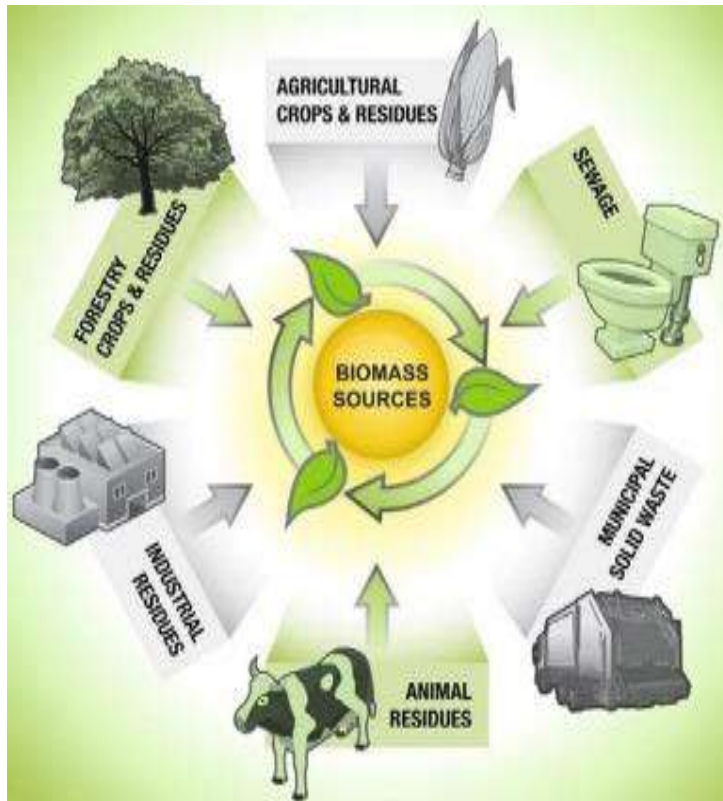
For a realistic chance to keep global warming within 1.5 degree Celsius, annual emissions would need to drop from the current level of about 50 billion tonnes of CO₂ equivalent to about 33 billion tonnes by 2030 and 8 billion tonnes by 2050, according to the newest Emissions Gap Report. Even for meet the 2-degree target, emissions have to come down to about 41 billion tonnes by 2030 and 20 billion tonnes by 2050. This would require drastic action from all the major emitters.

National Bioenergy Programme

Context: Recently, the Ministry of New and Renewable Energy organized a seminar on the National Bio Energy Programme in New Delhi in partnership with UNIDO and GEF as part of Azadi Ka Amrit Mahotsav along with launching of Biourja and Biogas portals.

- BioUrja portal has been developed as a single window platform to register and submit online applications for grant of Central Financial Assistance (CFA) to Waste to Energy projects, Biomass Briquette/Pellet manufacturing plants and Biomass (non-bagasse) based cogeneration projects.
- Biogas portal provides an overview on biogas related information.

About Biomass:



- Biomass has always been an important energy source for the country considering the benefits it offers.
- It is renewable, widely available, carbon-neutral and has the potential to provide significant employment in the rural areas.
- Biomass is also capable of providing firm energy.
- Biomass materials used for power generation include bagasse, rice husk, straw, cotton stalk, coconut shells, soya husk, de-oiled cakes, coffee waste, jute wastes, groundnut shells, saw dust etc.

Potential of Biomass:

- As per a recent study sponsored by MNRE, the current availability of biomass in India is estimated at about 750 million metric tonnes per year.
- The Study indicated estimated surplus biomass availability at about 230 million metric tonnes per annum covering agricultural residues corresponding to a potential of about 28 GW.

- This apart, about 14 GW additional power could be generated through bagasse based cogeneration in the country’s 550 Sugar mills, if these sugar mills were to adopt technically and economically optimal levels of cogeneration for extracting power from the bagasse produced by them.

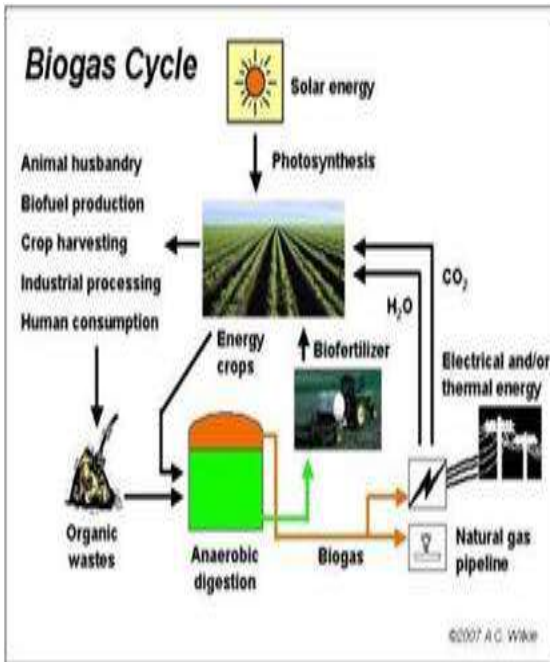
About National Bioenergy Programme:

- The Ministry of New and Renewable Energy has notified the National Bioenergy Programme in November 2022.
- MNRE has continued the National Bioenergy Programme for the period from FY 2021-22 to 2025-26.
- The Programme has been recommended for implementation in two Phases:
- **The Phase-I of the Programme** has been approved with a budget outlay of Rs. 858 crores.
- **It will comprise the following sub-schemes:**
- **Waste to Energy Programme:**
 - It is programme on Energy from Urban, Industrial and Agricultural Wastes /Residues to support the setting up of large Biogas, BioCNG and Power plants.
 - Indian Renewable Energy Development Agency (IREDA) will be the implementing agency for the program.
- **Biomass Programme:**
 - It is a Scheme to Support Manufacturing of Briquettes & Pellets and Promotion of Biomass (non-bagasse) based cogeneration in Industries to support setting up of pellets and briquettes for use in power generation and non-bagasse based power generation projects.
- **Biogas Programme:**
 - To support setting up of family and medium size Biogas in rural areas.

Significance of Bioenergy:

- **Organic enriched Bio-manure:** The digested slurry from biogas plants is a rich source of manure which shall benefit farmers in supplementing / reducing the use of chemical fertilizers.

- It is carbon neutral: As a natural part of photosynthesis, biomass fuels only release the same amount of carbon into the atmosphere as was absorbed by plants in the course of their life cycle.



- It reduces the overreliance of fossil fuels: Not only is there a limited supply of fossil fuels, but fossil fuels come with environmental baggage, including the release of large amounts of carbon dioxide into the atmosphere and the pollutants that result from removal, transportation and production.
- Less expensive than fossil fuels: While fossil fuel production requires a heavy outlay of capital, such as oil drills, gas pipelines and fuel collection, biomass technology is much cheaper. Manufacturers and producers are able to generate higher profits from a lower output.
- It helps in providing clean cooking through biogas.
- Co-firing in thermal power plants by utilizing biomass pellets and briquettes and BioCNG for transport.
- Setting up of biogas plants for clean cooking fuel, lighting, meeting thermal and small power needs of users which results in GHG reduction, improved sanitation, women empowerment and creation of rural employment.

Challenges before Bioenergy:

- Can lead to deforestation: Since wood is one of the most used sources of biomass energy, vast amounts of wood and other waste products have to be burned to produce the desired amount of power.
- While currently there is enough wood waste already, there is a risk of deforestation in the future.
- Biomass energy is not as efficient as fossil fuels: Some biofuels, like Ethanol, are relatively inefficient as compared to gasoline. In fact, it has to be fortified with fossil fuels to increase its efficiency.
- It is not entirely clear: While biomass is carbon neutral, the use of animal and human waste escalates the amount of methane gases, which are also damaging to the environment.
- Additionally, the pollution created from burning wood and other natural materials can be considered just as bad as that resulting from burning coal and other types of energy resources.
- Biomass construction plants don't come cheap: The harvest, transportation and storage of organic matter can be costly and go beyond what other renewable sources need such as solar power.

Way Forward:

- India is capable of generating over 750 million metric tonnes of biomass each year, creating a huge potential for the generation of bioenergy.
- The Ministry of New and Renewable Energy has been promoting bioenergy in India since the 1980s to make use of the surplus biomass, cattle dung, industrial and urban biowaste that are generated within the country.
- The benefits of utilization of surplus biomass should reach the rural household by way of an additional source of income for farmers.
- The extra push in the form of a 20 per cent higher standard CFA (central financial assistance) pattern for the north-eastern region and Gaushala/shelter was the need of the time to create inclusiveness in an applied manner.

Thus, as a whole it will also support to national commitments in achieving climate change goals, along with reduction in import of natural gas and crude oil and buffer against crude oil/gas price fluctuations.



SOCIETY & SOCIAL ISSUES



Rights of Persons with Disabilities

Context: Recently, the Supreme Court of India (SCI) discussed an important matter concerning the rights of persons with disabilities where the blanket exclusion of disabled persons from services such as the IPS, IRPF, DANICS, and Lakshadweep Police Service was challenged.

- As per the Census 2011, there are 26.8 million persons with disabilities in India, making up 2.21 per cent of the total population.
- The Ministry of Social Justice and Empowerment established the Department of Empowerment of Persons with Disabilities (Divyangjan) to ensure focused attention to policy issues related to persons with disabilities and work towards their empowerment.
- There has been no mention of disabled persons either in the constitution or the preamble.

About Rights of Persons with Disabilities Act, 2016:

It is the disability legislation passed by the Indian Parliament to fulfil its obligation to the United Nations Convention on the Rights of Persons with Disabilities, which India ratified in 2007.

Features:

- **Expansion of Disability Criteria:** Disability has been defined based on an evolving and dynamic concept.
 - The types of disabilities have been increased from the existing 7 to 21 and the Central Government has been given the power to add more types of disabilities.
- **Reservation:** Benefits such as reservation in higher education, government jobs, reservation in the allocation of land, poverty alleviation schemes, etc. have been provided for persons with benchmark disabilities and those with high support needs.
 - Reservation in vacancies in government establishments has been increased from 3% to 4% for certain persons or classes of persons with benchmark disabilities.
- **Inclusive Education:** Government-funded educational institutions as well as government-recognized institutions will have to provide inclusive education to the children with disabilities.
- **Right to Free Education:** Every child with a benchmark disability between the age group of 6 and 18 years shall have the right to free education.
- **Central & State Advisory Boards on Disability:** Broad-based Central & State Advisory Boards on Disability are to be set up to serve as apex policy-making bodies at the Central and State level.
- **District-level Committees:** District-level committees will be constituted by the State Governments to address local concerns of PwDs.
- **National and State Funds:** Creation of National and State Funds will be created to provide financial support to persons with disabilities.
- **Penalty:** It provides penalties for offenses committed against persons with disabilities and also violations of the provisions of the new law.
- **Special Courts:** Special Courts will be designated in each district to handle cases concerning the violation of rights of PwDs.

SC Observations:

- **First Observation:** By referring to V Surendra Mohan v. State of Tamil Nadu (2019) case, the court observed that disabled judge was 100 percent blind. he would be cheated by juniors; people would make him sign all kinds of wrong documents, and therefore, it caused problems.

- This observation warrants a deeper analytical response since just because someone was cheated in one instance, it does not form a valid basis for the deprivation of rights to an entire class of citizens (persons with disabilities).
- **Second Observation:** It was observed that the reserved seats for the disabled were filled up just for the sake of it.
 - Such an observation does not align with ideas of sensitivity and the human dignity of persons with disabilities.
- **Third Observation:** The third observation was, “Sympathy is one aspect, practicality is another aspect”.
 - The petitioners are not seeking sympathy. They are rather making a legal, rights-based approach. It is the recognition of their legal rights that they are fighting for.

Way Forward:

- Reasonable accommodation is necessary to help persons with disabilities exercise their rights and participate in society equally with others.
- It’s not about sympathy but Person with Disabilities requires empathy and understanding.
- The practicality aspect has to be assessed on the basis of the legal test of “undue burden”.
- Whether providing reasonable accommodation is imposing too much of a burden on the duty bearer, only then can reasonable accommodation be refused for being impractical.
- The citizens of the country should not leave any stone unturned to make the lives of the differently abled ones much easier.

About United Nations Convention on the Rights of Persons with Disabilities (UNCRPD)

- The Convention was adopted by the General Assembly in December 2006 and it came into force on in May 2008.
- Parties to the convention are required to promote, protect, and ensure the full enjoyment of human rights by persons with disabilities and ensure that persons with disabilities enjoy full equality under the law
- It is intended to protect the rights and dignity of persons with disabilities.
- The convention is monitored by the Committee on the Rights of Persons with Disabilities.

Looking upon age of consent for adolescents

Context: Recently the Dharwad Bench of the Karnataka High Court, while dismissing a case filed under the Protection of Children from Sexual Offences Act, 2012, said the Law Commission of India would have to rethink the age criteria, to take into consideration the ground realities.

- The aspect of consent by a girl of 16 years, but who is below 18 years, would have to be considered, it said, if it is indeed an offence under the Indian Penal Code (IPC) and/or the POCSO Act.

About POCSO Act 2012:

This comprehensive law provides for protection of children from sexual assault, sexual harassment and pornography, while safeguarding the interests of children at every stage of the judicial process through child-friendly mechanisms for reporting, recording of evidence, investigation and speedy trial through special courts.

Salient Provisions of the Act:

- “Children” according to the Act are individuals aged below 18 years. The Act is gender-neutral.
- Different forms of sexual abuse including but not limited to sexual harassment, pornography, penetrative & non-penetrative assault are defined in the Act.
- Sexual assault is deemed to be “aggravated” under certain circumstances such as when the child is mentally ill. Also, when the abuse is committed by the person in a position of trust such as a doctor, teacher, policeman, family member.
- The Act assigns a policeman in the role of child protector during the investigation process. The investigation and trial are to be done in a way to minimise further trauma on the child.

- Any case under POCSO is mandated to be disposed of within one year from the date of reporting of the offence.
- The Act provides for the establishment of Special Courts for the trial of such offences and matters related to it.
- The power to make rules lies with the central government. To monitor the implementation of the Act, the National Commission for the Protection of Child Rights (NCPCR) and State Commissions for the Protection of Child Rights (SCPCRs) have been made the designated authority. Both being statutory bodies.
- Section 42 A of the Act gives POCSO Act overriding powers over other acts.
- The Act calls for mandatory reporting of sexual offences. A false complaint with intent to defame a person is punishable under the Act.

Drawbacks of the POCSO Act:

- Under the POCSO Act, 2012, and under several provisions of the IPC, whoever commits a penetrative sexual assault on a child — anyone below 18 years of age — can be “imprisoned for a term which is not less than seven years but which may extend to imprisonment for life, and shall also be liable to fine.”
- Even if the girl is 16 years old, she is considered a “child” under the POCSO Act and hence her consent does not matter, and any sexual intercourse is treated as rape, thus opening it up to stringent punishment.
- There have been several instances in the past few years when the courts have quashed criminal proceedings of rape and kidnapping, after being convinced that the law was being misused to suit one or the other party.
- The act also does not recognise consensual sex between pre-adult teenagers, often putting the boy in this case as an accused of rape charges.

Misuse of the act:

- In its order, and several other courts have passed similar judgments too, the Karnataka High Court said the effect of such criminal prosecution of a minor girl or boy is causing severe distress to all concerned, including the families. Sometimes, disgruntled parents file a case to foil a relationship between two adolescents.
- In 2019, a study, Why Girls Run Away to Marry – Adolescent Realities and Socio-Legal Responses in India, published by Partners for Law in Development, made a case for the age of consent to be lower than the age of marriage to decriminalise sex among older adolescents to protect them from the misuse of law, sometimes by parents who want to control who their daughters or sons want to marry.
- The study noted that in many cases, a couple elopes fearing opposition from parents resulting in a situation where families file a case with the police, who then book the boy for rape under the POCSO Act and abduction with the intent to marry under IPC or the Prohibition of Child Marriage Act, 2006.

Case study: Vijaylakshmi vs State Rep case 2021

- The Madras High Court said the definition of ‘child’ under Section 2(d) of the POCSO Act can be redefined as 16 instead of 18.
- It said that any consensual sex after the age of 16 or bodily contact or allied acts can be excluded from the rigorous provisions of the POCSO Act.
- The court suggested that the age difference in consensual relationships should not be more than five years to ensure that a girl of an impressionable age is not taken advantage of by “a person who is much older.

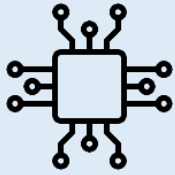
Way forward:

- With the courts and rights activists seeking amendment to the age of consent criteria, the ball lies in the government’s court to look into the issue.
 - In the meantime, adolescents have to be made aware of the stringent provisions of the Act and also the IPC.
- The Karnataka High Court Bench directed the Principal Secretary of the Education Department to constitute a committee to formulate suitable education material for adolescents on the law on sexual offences and its consequences.

- Adolescents have to be made aware of the stringent provisions of the Act and also the IPC.
- There is a compelling need for law reform to revise the age of consent and prevent the criminalisation of older adolescents engaging in factually consensual and non-exploitative acts.
- Even as activists are calling for a tweak to the POCSO Act, and raising awareness about its terms, a parliamentary committee is looking into the Prohibition of Child Marriage (Amendment) Bill, 2021 which seeks to increase the minimum age of marriage for women to 21 years.
 - Rights activists feel instead of helping the community, raising the age may force vulnerable women to remain under the yoke of family and social pressures.

Government should examine the provisions of the POCSO Act which are being misused and amend them. The principles of Right to life and survival and the best interests of all children concern, should be protected.

MUST READ: [National Commission for Protection of Child Rights \(NCPCR\)](#)



SCIENCE & TECHNOLOGY



Technology in the aid of Farming Community

Context: The Prime Minister highlighted that the initiatives like Kisan Rail, DBT transfers, Soil Health Cards, e-NAM, and neem coating of urea, have integrated and scaled-up technology in agriculture during the PM Kisan Samman Sammelan which was held recently.

- He also highlighted drones are another such revolutionary technology to add to farmers' prosperity and dignity.



- As per the latest report by the World Economic Forum (WEF), drones have the potential to be the harbinger of the "technology-led transformation" of Indian agriculture.
- In India's \$600 billion agriculture sector, they are currently used for pesticide and nutrient application, mapping water spread area, sampling water, mapping macrophyte infestation, etc.

About Drone or Unmanned Aerial Vehicle:

- An unmanned aerial vehicle, commonly known as a drone, is an aircraft without any human pilot, crew or passengers on board.
- UAVs are a component of an unmanned aircraft system, which includes a ground-based controller and a system of communications with the UAV additionally.
- Drones have been divided into five categories based on their weight (existing rules)-
 - Nano: Less than or equal to 250 grams
 - Micro: From 250 grams to 2 kg
 - Small: From 2 kg to 25 kg,
 - Medium: From 25 kg to 150 kg,
 - Large: Greater than 150 kg.

Revolutionising Indian agriculture with aid of Drones:

- **Precision agriculture:** As per WEF, drone usage could reduce the cost of application by 20 percent and also mitigate health hazards of manual work, thereby promoting precision agriculture.
 - Drones enable data collection and resource-efficient nutrient application.
 - This data facilitates crop production forecast and evidence-based planning.
 - With drones, government initiatives like Per Drop More Crop will improve, and water use inefficiency in irrigation will decline.
 - Agri-research will become "highly customized and localised" with drones.
- **Streamlining of schemes:** Drones' data integrated with GIS and Google Earth satellite images will eventually streamline schemes like PMFBY by aiding crop-cutting experiments, crop-loss estimation, insurance determination, and dispute resolution.
- **Better cropping patterns:** The government can announce relief packages for farmers in time, leading to better sowing, irrigation, and harvesting cycles.
- **Capturing backward and forward linkages:** With objective and standardized data on crop quality, food processing industries will procure from farmers at better prices.
- Agri-exports will also increase with technology-supporting compliance with global standards.

Challenges before Indian Farming community:

- Eighty five percent of the Indian farmers are small and marginal landholders and the drones cost between ₹1 lakh and ₹10 lakh.
 - The drone acquisition will increase the cost of cultivation by 45 percent despite productivity gains.
- To address this, FPOs and custom hiring centres should be encouraged to buy and loan them to the farmers for a nominal fee.
- The government provides subsidies in the range of 40-60 percent for the cost of drones.
- As per an ICAR report, India faces challenges due to weather dependency of drones, improper internet connectivity across farms, unskilled end user, and potential for misuse.

Government of India Initiatives to promote drone technology:

- The Indian arm of the Swiss-based firm launched a drone yatra to cover 10,000 km across 13 States from Mancher near Pune in Maharashtra.
- A few firms such as Unnati, an Agri-tech start-up platform, have launched drone services. The firm plans to spray 20,000 acres of land by the end of 2022 and increase drones' spray capacity by 4 times next year.
- The Indian Government is popularizing the use of drones by offering various financial assistance to purchase drones for demonstrations.
- Drone purchases by Custom Hiring Centres (CHCs) are given 40 percent assistance.
- The Centre is providing ₹6,000 per hectare as a contingency fund to farmers to hire drones from CHCs.

The central government notified the Drone Rules 2021 with the following features:

- Abolish the need for various approvals, including certificate of conformance, certificate of maintenance, import clearance, acceptance of existing drones, operator permits, authorisation of R&D organisation and student remote pilot license.
- It shall be developed as a user-friendly single-window system. There will be minimal human interface and most permissions will be self-generated.
- The draft rules reduced the airport perimeter from 45 km to 12 km.
- The rules state that no flight permissions would be required to fly upto 400 feet in green zones and up to 200 feet in the area between 8 and 12 km from the airport perimeter.
- No pilot license would be needed for micro drones for non-commercial use, nano drones and for R&D organisations.
- There would be no restriction on drone operations by foreign-owned companies registered in India.
- The Ministry will also facilitate the development of drone corridors for cargo deliveries and a drone promotion council will be set up to facilitate a business-friendly regulatory regime.
- The draft rule also provides for safety features such as real-time tracking beacon, and geo-fencing, which are expected to be notified in the future and a six-month lead time will be provided for compliance.
- Coverage of drones under Drone Rules, 2021 increased from 300 kg to 500 kg. This will also cover drone taxis.

Way Forward:

- The need is to scale up drone use in the agriculture sector from the present 10,000 aerial vehicles.
- Civil military engagement should be promoted to realise gains from the cross-industry application of drones.
- Consultations may be held with experienced strategic partners like Israel where AI-enabled drones are used for mapping plots, assessing crop damage, and even plucking only ripe apples.
- A dedicated research fund and a 'sandbox' or 'green microcosm' should be provided to the private players.

Thus, use of drones in agriculture will revolutionise farm operations and empower our farmers, especially the smallholders with information and applications that will help them enhance their yields and income in the long run and help the Indian agriculture sector make a huge leap.

Rare Earth Metals

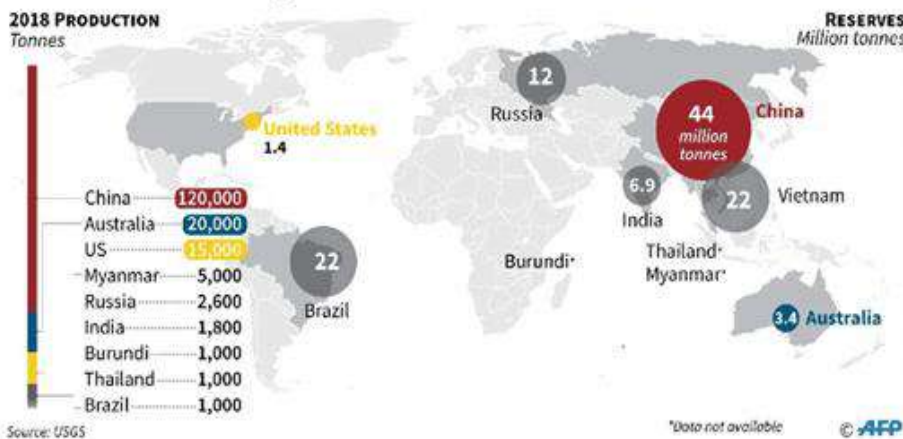
Context: Recently, the Confederation of Indian Industry (CII) has urged the government to encourage private-sector mining in the Rare Earths minerals sector to counter India’s reliance on China for imports of such minerals. The industry has demanded to Set up an ‘India Rare Earths Mission’.

About Rare Earth Minerals:

- Rare earth metals are a group of 17 elements – lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium, yttrium.
- They are lustrous silvery-white soft heavy metals.
- These metals have unusual fluorescent, conductive, and magnetic properties, which make them very useful when alloyed, or mixed, in small quantities with more common metals such as iron.
- However, with the exception of the highly-unstable promethium, rare earth elements are found in relatively high concentrations in the earth’s crust.
- The rare earths occur in many other minerals and are recoverable as by-products from phosphate rock and from spent uranium leaching.

Reserves and Production:

Rare earth metals production and reserves



- The total world reserves are estimated at 121 million tonnes of rare earth oxides (REO).
- China alone accounts for 44 million tonnes followed by Brazil and Vietnam (18% each) and Russia (15%).
- China accounts for 90% of the world’s rare earth production.
- The other major producers are Australia, USA, Russia, Malaysia and Vietnam.

Significance of Rare Earth Metals:

- **Manufacturing of Batteries:** Minerals like Cobalt, Nickel, and Lithium are required for batteries used in electric vehicles.
- **Used in most of the consumer products:** REEs are an essential although often tiny component of more than 200 consumer products which includes mobile phones, computer hard drives, electric and hybrid vehicles, semiconductors, flat screen TVs and monitors, and high-end electronics.
- **Electric Vehicles:** India has an ambitious plan to convert a large percentage of its transport to electric and this would require these minerals.
 - 80 percent of the country’s two- and three-wheeler fleet, 40 percent of buses, and 30 to 70 per cent of cars will be EVs by 2030.
- **Clean energy:** They are critical for developing clean energy which is the need of the hour today.
- **Industrial use:** Traditional uses like Cerium for glass polishing and lanthanum for car catalysts or optical lenses.
- **Manufacturing of magnets:** neodymium, praseodymium and dysprosium, are crucial to the manufacture of magnets which are used in industries and also in wind turbines and Drones.

Issues associated with extraction of Rare Earth Metals:

- **Difficult to mine:** Although they are more abundant than their name implies, they are difficult and costly to mine and process cleanly.
- **Environmental Impact:** The chief concern is that the rare earth elements are bound up in mineral deposits with the low-level radioactive element thorium, exposure to which has been linked to an increased risk of developing lung, pancreatic, and other cancers.
- **Chinese Dominance:** Amid the transition to green energy, in which rare earth minerals are sure to play a role, China's market dominance is enough to sound an alarm in western capitals.
- **Monopoly of few:** Most of the reserves being present in few nations causes problems for most of the world because of the concentration of reserves in the hands of few countries.
- **Supply Chain:** Forming forward and backward supply chains will create problems when the reserves are mostly limited to one country.

Rare Earth Metals in India:

- In India, monazite is the principal source of rare earths and thorium.
- Rare earth elements contribute a total value of nearly \$200 billion to the Indian economy.
- India has the world's fifth-largest reserves of rare earth elements, nearly twice as much as Australia, but it imports most of its rare earth needs in finished form from its geopolitical rival, China.
- Indian Rare Earths Ltd (IREL), a Government of India Undertaking, and KMML, a Kerala State Government Undertaking, are actively engaged in mining and processing of beach sand minerals from placer deposits.
- As per the Foreign Trade Policy, 2015-2020 and the effective policy on export and import, the import of ores and concentrates of rare earth metals and of rare earth oxides including rutile sand are permitted 'freely'.

Challenges for India:

- **Scaling Up:** The key challenge for India today is to scale up upstream and downstream processes in the rare earths value chain.
- **Monopoly of Government:** India has granted government corporations such as IREL a monopoly over the primary mineral that contains REEs: monazite beach sand, found in many coastal states.
- **Capital-Intensive:** The mining and extraction processes are capital-intensive and consumes large amounts of energy.
- **Competition from World:** India must open its rare earth sector up to competition and innovation and attract the large amounts of capital needed to set up facilities to compete with, and supply to, the world.
- **Toxic By-products:** The mining releases toxic by-products, an issue that has caused some controversy in India before.

Suggestive Measures for India:

- **New Department for Rare Earths (DRE):** The best move forward might be to create a new Department for Rare Earths (DRE) under the Ministry of Petroleum & Natural Gas, drawing on its exploration, exploitation, refining, and regulation capabilities.
- **Allow Private Companies:** This DRE should oversee policy formulation and focus on attracting investment and promoting R&D, with its first move being to allow private sector companies to process beach sand minerals within appropriate environmental safeguards.
- **Autonomous Regulator:** It should also create an autonomous regulator, the Rare Earths Regulatory Authority of India (RRAI), to resolve disputes between companies in this space and check compliance.
- **Better Coordination:** The DRE could coordinate with other agencies to partner directly with groupings such as the Quad, building up a strategic reserve as a buffer against global supply crises.
- **Encourage Indian Firms:** While domestic reforms are awaited, Indian companies can be encouraged to form such junior exploration businesses in the Indian Ocean Region (IOR) to prospect for REEs and feed value added products into Indian market.

Way Forward:

- **Building up domestic capability:** There is a need to build domestic capability and broad-base supply sources for such an important and strategic raw material.
- **Making it part of Make in India campaign:** There is a need to make rare earth minerals a part of the 'Make In India' campaign, citing China's 'Made in China 2025' initiative that focuses on new materials, including permanent magnets that are made using rare earth minerals.
- **Supply chain resilience:** The focus should be back on building cooperation on supply chain resilience which is a trade partnership for critical and emerging technology to deal with issues of climate, economy and pandemic impact.
- **Minerals Security Partnership (MSP):** India should try through diplomatic channels to enter this partnership. (As, India is not a member of this.)
 - It is a US-led partnership initiative of 11 nations which aims to bolster critical mineral supply chains.
 - Partnership includes the USA, Australia, Canada, Finland, France, Germany, Japan, South Korea, Sweden, the United Kingdom, and the European Commission.
- **QUAD critical and Emerging Technology Working group:** It aims to develop supply resilience among Quad members which includes India, US, Japan, and Australia.
- **Green goals:** the critical minerals and emerging technology are the major need of the hour for achievement of green future goals.



PRACTICE QUESTIONS



Q.1) Consider the following statements regarding Indian Evidence Act:

1. It was originally passed in India by the Imperial Legislative Council in 1872, during the British Raj.
2. It contains a set of rules and allied issues governing admissibility of evidence in the Indian courts of law

Which of the above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.2) With reference to Vallabhbhai Patel, consider the following statements:

1. He is referred to as “Punjab Kesari”
2. He served as the first Indian municipal commissioner of Ahmedabad.
3. He was the elected president of 1928 session of INC.

Which of the statements given above is/are correct?

- a. 1 and 3 only
- b. 2 only
- c. 2 and 3 only
- d. 1, 2, and 3

Q.3) Under whose prime ministerialship, the Ninth Schedule was inserted into the Constitution of India through first constitutional amendment?

- a. Jawaharlal Nehru
- b. Indira Gandhi
- c. Gulzarilal Nanda
- d. Lal Bahadur Shastri

Q.4) The ‘Purchasing Manager’s Index’ is sometimes seen in the news. Which of the following prepares the same?

- a. Ministry of Statistics and Programme Implementation
- b. Office of Economic Advisor
- c. S&P Global India
- d. The National Council of Applied Economic Research (NCAER)

Q.5) With reference to Uttar Pradesh’s Bioenergy Policy 2022, consider the following statements:

1. Ministry of New and Renewable Energy (MNRE) is the nodal agency for implementing this scheme.
2. It, among other things will also provide leased land at Rs. 1 per acre
3. It aims to boost agricultural mechanization.

Which of the statements given above is/are correct?

- a. 1 and 3 only
- b. 2 only
- c. 2 and 3 only
- d. 1, 2, and 3

Q.6) With reference to India’s Biodiversity, Papaya Mealy Bug, Rosy wolf, Bombax ceiba are

- a. Native plant species
- b. Invasive animal species
- c. Native animal species
- d. Invasive plant species

Q.7) ‘HARIT Aaykar initiative’ has been launched by

- a. The Income Tax department
- b. Ministry of Tribal Affairs
- c. National Cadet Corps
- d. Tribal Cooperative Marketing Development Federation of India Limited (TRIFED)

Q.8) With reference to Tiangong space station, consider the following statements:

1. It weighs about 66 tons while the International Space Station weighs around 465 tons.
2. Mengtian is the second module to the space station, followed by Wentian.
3. China became the fourth country to put a human into space.

Which of the statements given above is/are correct?

- a. 1 and 3 only
- b. 2 only
- c. 1 only
- d. 1, 2, and 3

Q.9) With reference to Charminar in Hyderabad, consider the following statements:

1. It was built by Sultan Mohammed Quli Qutb Shah in 1591.
2. It is situated on the east bank of Musi River.
3. It has been built with granite and lime mortar and pulverised marble

Which of the above statements are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1 2 and 3

Q.10) Consider the following statements:

- Performance Grading Index (PGI) is an initiative of the Pratham Education Foundation.
- In 2020-21, Kerala has been ranked first.
- Annual Status of Education Report (ASER) Survey is released by the Ministry of Education.

Which of the above statements is/are correct?

- 1 only
- 2 and 3 only
- 1, 2 and 3
- None

Q.11) With reference to Indian Rhinos, consider the following statements:

- They are omnivores and live primarily in India and Nepal.
- They are excellent swimmers but have poor eyesight.
- The females are larger than the males.
- Among the States in India, the highest elephant population is in Assam.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 and 4 only
- 3 only
- 1, 3 and 4 only

Q.12) Consider the following statements regarding World Network of Biosphere Reserves:

- Every year November 3 is celebrated as 'The International Day for Biosphere Reserves' since 1971.
- India has 14 internationally recognised Biosphere Reserves.
- They are created under the Man and the Biosphere Programme (MAB).

Which of the statements given above is/are correct?

- 1 only
- 2 and 3 only
- 3 only
- 1 and 2 only

Q.13) With reference to Governor of State, consider the following statements:

- Sending a report to the President of India for imposing the President's rule.
- Appointing the ministers of a state.
- Reserving certain bills passed by the State Legislature for consideration of the President of India.

Select the correct answer using the code given below.

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1, 2, and 3

Q.14) Consider the following statements regarding United Nations Framework Convention on Climate Change (UNFCCC):

- It is an intergovernmental treaty to control of emission of Green House Gases (GHGs) that cause global warming.
- It was signed at the 1972 Rio Earth Summit.
- It has been ratified by 200 plus countries and has a near-universal membership.

Which of the above statements is/are correct?

- 1 only
- 2 and 3 only
- 3 only
- 1, 2 and 3

Q.15) Consider the following statements regarding Amur Falcons:

- It is endemic to the Indian subcontinent.
- It is listed as Endangered species under IUCN's red data list .
- It is also listed in Appendix II of CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora).

Which of the above statements is/are correct?

- 2 only
- 1 and 3 only
- 3 only
- 1, 2 and 3

Q.16) Recently, our scientists have discovered a new and distinct species of black-coloured honey bees which can produce higher quantities of honey in thicker consistency. In which part of India has it been discovered?

- Andaman Islands
- Arunachal Pradesh
- The Himalayas
- Western Ghats

Q.17) With reference to Shyama Prasad Mukherji Rurban Mission, consider the following statements:

1. It is a flagship scheme of Ministry of Panchayati Raj.
2. It was launched in 2019.
3. It aims to stimulate infrastructural development like roads, water supply, etc.
4. It, among other things will also market agriculture products.

Which of the statements given above is/are correct?

- a. 1 and 3 only
- b. 3 and 4 only
- c. 3 only
- d. 1, 3 and 4 only

Q.18) 21/Matrix-M vaccine, which is often mentioned in news used to prevent which of the following diseases?

- a. Malaria
- b. Dengue
- c. Tuberculosis
- d. Hepatitis B

Q.19) Consider the following statements regarding National Commission for Protection of Child Rights (NCPCR):

1. It is a statutory body established by an act of parliament.
2. According to Commission for Protection of Child Rights Act, 2005, a child is defined as a person falling in the age group of 0 to 14 years.
3. The Commission has all the powers of a civil court trying a suit under the Code of Civil Procedure, 1908.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.20) With reference to Puffer Fish, consider the following statements:

1. There is no known antidote for poison of pufferfish.
2. They inflate themselves into ball-shape to navigate the ocean better.
3. They are found only in brackish waters along the coastlines.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 and 3 only
- c. 3 only
- d. 1, 2 and 3 only

Q.21) The term “safe maritime humanitarian corridor” is often mentioned in news in the context of

- a. Export of grain, food and fertilizers from Ukraine through black sea
- b. Export of crude oil from gulf countries through Persian Gulf
- c. Humanitarian assistance to the Syria
- d. None of the above

Q.22) Consider the following statements about the ‘Counter Terrorism Committee’,

1. It is a subsidiary body of United National Security Council.
2. It maintains a list of terrorist groups or individuals.

Which of the following statements are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.23) Consider the following countries:

1. Mexico
2. Italy
3. Israel
4. North Korea
5. South Korea
6. Ukraine

Which of the above are among are not part of G20?

- a. 1, 2, 4 and 5
- b. 3, 4, and 6
- c. 1, 3, and 5
- d. 2, 3, 4 and 6

Q.24) Consider the following statements about UN Human Rights Council

1. The Human Rights Council is an inter-governmental body for the promotion and protection of human rights around the world.
2. It is made up of 43 UN Member States which are elected by the UN General Assembly.
3. Members of the Council serve for a period of three years and are not eligible for immediate re-election after serving two consecutive terms.

Choose the correct statements:

- a. 1 and 2
- b. 2 and 3
- c. 1, 2 and 3
- d. 1 and 3

Q.25) Consider the following statements:

1. Mangrove Breakthrough was launched at COP26 in Glasgow, United Kingdom.
2. The Global Mangrove Alliance which ensures mangrove restoration, was formed in 2018.

Which of the following statements are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.26) What are the reasons for reddish appearance of beaver blood moon?

- a. Alignment of orbits of the Earth, moon and sun
- b. Atmospheric conditions including air pollution and dust storms
- c. Refraction of rays of sunlight around umbra
- d. Tilt of the moon's orbit around the Earth

Q.27) Consider the following statements regarding Guru Nanak Dev:

1. He advocated the 'Nirguna' (devotion to and worship of formless divine) form of bhakti.
2. Kartarpur corridor was built to commemorate the 450th birth anniversary celebrations of Guru Nanak Dev, founder of Sikhism in 2020.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.28) With reference to Pashmina shawls, consider the following statements:

1. India contributes about 10% of the world's Pashmina.
2. Pashmina is obtained from mountain goats found in the Nubra valley in Ladakh.

Which of the following statements are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.29) Consider the following statements:

1. India launched the International Drought Resilience Alliance (IDRA) at 27th COP of UNFCCC.
2. Kenya made a commitment to plant five billion trees under the alliance.

3. United Nations Convention to Combat Desertification (UNCCD) focusses both on desertification and mitigation of drought.

Which of the following statements are correct?

- a. 1 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1, 2 and 3

Q.30) Consider the following statements regarding POCSO act:

1. The act is gender neutral and defines children as individuals below the age of 16 years.
2. The Act provides for the establishment of Special Courts for the trial of such offences and matters related to it.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.31) With reference to modern Indian history, consider the following statements:

1. He was the founder of the Jamia Milia Islamia Institution in Delhi.
2. He was posthumously awarded India's highest civilian honour, the 'Bharat Ratna' in 1992.
3. He presided over the special session of Congress in September 1923 and was said to be the youngest man elected as the President of the Congress.
4. He advocated for the ending of separate electorates based on religion and called for a single nation committed to secularism.

Who among the following has been described above?

- a. Madan Mohan Malviya
- b. Lal Bahadur Shastri
- c. Maulana Abul Kalam Azad
- d. Muhammad Ali Jinnah

Q.32) With reference to The Council of Scientific & Industrial Research (CSIR), consider the following statements:

1. CSIR is funded by the Ministry of Earth Sciences.
2. Prime Minister of India (Ex-officio) act as ex-officio President.
3. CSIR has established the first-ever 'Traditional Knowledge Digital Library' in the world.

Which of the statements given above are correct?

- 1 and 2 only
- 2 and 3 only
- 1 and 3 only
- 1 2 and 3

Q.33) Consider the following statements regarding House arrest:

- The Code of Criminal Procedure gives detailed grounds for house arrest.
- House arrested persons are always include restrictions on travel and meeting people, and may include electronic surveillance of the prisoner by means of a wearable tracking device.

Which of the statements given above is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.34) Consider the following statements and identify the personality among the following:

- He was part of the Non-Cooperation Movement, the Civil Disobedience movements, and Quit India Movement (1942).
- He was the President of Indian National Congress (INC) at the time of independence.
- He became one of the founders of the Kisan Mazdoor Praja Party.
- He was a critic of Nehru's policies and Indira Gandhi's rule.

Choose the correct answer using the code given below:

- Rajendra Prasad
- Abdul Kalam Azad
- B N Rau
- J B Kripalani

Q.35) Recently, the Global Dashboard for Vaccine Equity has put out recent data that justifies the vexatious core of the vaccine distribution programme. It was jointly established by

- United Nations Development Programme, World Health Organization and the University of Oxford
- United Nations Development Programme and World Health Organization
- World Health Organization and World Bank
- United Nations Development Programme, World Health Organization and the World Bank

Q.36) The term 'new collective quantified goal on climate finance' (NCQG) often mentioned in news is related to

- India's Nationally Determined Contributions (NDCs).
- A global climate finance target being proposed by developing countries at COP 27 of UNFCCC, 2022.
- One of the global climate finance commitments under Paris Climate Deal of 2015.
- A corporate sector initiative across the world to pool together CSR to finance climate action.

Q.37) With reference to India's biodiversity, Buff-barred Warbler, Rusty-capped Fulvetta, Eyebrowed Thrush and Eastern Yellow Wagtail are

- Primates
- Birds
- Reptiles
- Amphibians

Q.38) With reference to 'Global Methane Pledge,' consider the following statements:

- It was launched at 26th COP of UNFCCC.
- India made a commitment to reduce methane emissions by 30 percent by 2030.
- Methane is 60 times more potent than carbon dioxide at trapping atmospheric heat.

Which of the following statements are correct?

- 1 only
- 1 and 3 only
- 2 and 3 only
- None

Q.39) With reference to modern consider the following statements:

- He was the Dewan of the erstwhile Travancore princely state from 1936 to 1947.
- Under his Dewanship, Travancore became the first princely state to abolish capital punishment, first to introduce free and compulsory education, first to introduce universal adult franchise and the first to be connected to the rest of India by air.
- He was the patron of the Trivandrum Club and the Travancore Athletic Association.

Who among the following has been described in the above statements?

- M Visvesvaraya
- K Seshadri Iyer
- CP Ramaswamy Iyer
- V Sivankutty

Q.40) With reference to "Climate Change Performance Index," consider the following statements:

- It is released by the New Climate Institute and the Climate Action Network.

2. It is a biannual publication which was first released in 2005.
3. India is ranked 10th in the latest CCPI.

Which of the following statements are correct?

- a. 1 only
- b. 1 and 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

Q.41) The report "Financing India's Urban Infrastructure Needs" is published by the

- a. International Monetary Fund
- b. United Nations Conference on Trade and Development
- c. World Economic Forum
- d. World Bank

Q.42) Consider the following statements regarding Indian Biological Data Centre' (IBDC):

1. The Indian Biological Data Centre is India's first national repository for life science data established in Bengaluru.
2. It operates with the assistance from the Department of Biotechnology (DBT).

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.43) Who among the following was/were associated with the introduction of Chotanagpur Tenancy Act 1908 in India during the British rule?

1. Johannes Baptist Hoffman
2. Birsa Munda
3. Lala Lajpat Rai

Which of the following statements are correct?

- a. 2 only
- b. 1 and 2 only
- c. 2 and 3 only
- d. 1, 2 and 3

Q.44) With reference to the agrarian practices in India, the "Khuntkatti" belongs to

- a. Chuars of Midnapore
- b. Bhils of Western Ghats
- c. Mundas of Chotanagpur
- d. Santhals of Rajmahal hills

Q.45) With reference to India's biodiversity, consider the following statements:

1. Jim Corbett Tiger reserve spreads across two districts only.
2. Wildlife (Protection) Act, 1972 provides for the Constitution of the National Board for Wildlife with the PM as its chairperson.
3. Jim Corbett Tiger reserve included in the Project Tiger.

Which of the statements given above are correct?

- a. 1 2 and 3
- b. 1 and 2 only
- c. 1 and 3 only
- d. 2 and 3 only

Q.46) With reference to the 'Carbon Border Adjustment Mechanism' at the UNFCCC Meeting in Sharm el-Sheikh in 2022, which of the following statements is/are correct?

1. The initiative was jointly proposed by the United States and France.
2. India, Brazil, and South Africa opposed the initiative, while China supported it.
3. The initiative aimed to tax extremely carbon intensive products like cement and steel with effect from 2026.

Select the correct answer using the code given below.

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 only
- d. 3 only

Q.47) What is the aim of the programme 'Digital Shakti Program 4.0'?

- a. To train women to use digital knowledge and support their business ideas
- b. To protect women from cybercrimes and maintain online safety
- c. To create digital assets like CCTV systems to enable women safety
- d. To increase women participation in STEM courses in higher education.

Q.48) Consider the following statements in respect of Antimicrobial Resistance (AMR):

1. It occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections.
2. World Antimicrobial Awareness Week (WAMRW) is celebrated as an annual event in last week of October.
3. They can spread from person to person or between people and animals, including from food of animal origin.
4. Global Action Plan on Antimicrobial Resistance (GAPAMR) was endorsed by the Food and

Agriculture Organization (FAO) and the World Health Organization.

Which of the statements given above are correct?

- 1 and 2 only
- 1 and 3 only
- 3 and 4 only
- 2 and 3 only

Q.49) Consider the following statements and identify the freedom fighter:

1. She was one among the warriors or Veeranginis (amazons/heroines) of the 1857 Indian Rebellion against the British East India Company.
2. She was a freedom fighter from the Pasi community, hailed from Uttar Pradesh.
3. In order to prepare for the battle that was headed their way, the Begum Hazrat Mahal helped her form a women's battalion under her command.

Select the correct answer using the code given below:

- Durga Bhabhi
- Uda Devi
- Velu Nachiyar
- Rani Lakshmbai

Q.50) The species called "Melocanna Baccifera" often mentioned in news is related to

- Sugarcane
- Banana
- Bamboo
- Coconut

Q.51) With reference to ancient India, the terms "Manikpatna, Chelitalo, Palur and Pithunda" are related to

- Major tourist centres
- Temple towns
- Water reservoirs
- Port cities

Q.52) Consider the following statements

1. With reference to National Family Health Survey – 5, Unmet needs of family planning have declined from 13 per cent to 9 per cent.
2. Mission Parivar Vikas aims to reduce unmet needs in family planning.

Select the correct answer using the code given below.

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.53) Which of the following statements is/are correct? Proper design and effective implementation of Bio restoration Programme can significantly contribute to

1. protection of coral reefs
2. resilience of mangrove forest ecosystems
3. poverty reduction

Select the correct answer using the code given below.

- 1 and 2 only
- 3 only
- 2 and 3 only
- 1, 2 and 3

Q.54) Which of the following statements is/are correct regarding the Group of 20 (G20).

1. The G20 countries are responsible for about 80% of World's Carbon emissions.
2. Germany, Singapore and Democratic Republic of Korea are the members of the group.
3. India will join its 'Troika' in December 2022 along with Indonesia and Brazil.

Select the answer using the codes given below:

- 1 only
- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3 only

Q.55) Consider the following statements:

1. The Ring of Fire is a 50,000 km long fault line in Pacific Ocean.
2. It contains two-thirds of world's total volcanoes.
3. It traces the boundary with Indian-Australian plate and African plate.

Which of the statements given above are correct?

- 1 and 2 only
- 3 only
- 2 only
- 2 and 3 only

Q.56) Consider the following in respect of 'Toilets 2.0':

1. Toilets 2.0 is an initiative of the Ministry of Health and Family Welfare, Government of India.
2. Toilets 2.0 has been launched in a mission mode to improve community toilets in rural areas through collective action.
3. It has five thematic areas including a design challenge.

Select the correct answer using the code given below.

- 1 and 2 only
- 3 only
- 2 and 3 only

d. 1, 2 and 3

Q.57) Consider the following statements regarding Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY):

1. It was started during the difficult time of COVID-19 crisis, to provide food security to the poor, needy and the vulnerable households/beneficiaries.
2. Under this welfare scheme, 15 kg of foodgrains per person per month is provided free of cost for all the citizens of India.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.58) With reference to Indian history, which of the following statements is/are correct?

1. The Battle of Alaboi was fought in 1669 between Mughals and Rajput Raja Ram Singh I.
2. The Battle of Saraighat 1671 was won by Lachit Bophukan of Ahom kingdom.
3. While the battle of Alaboi was a naval battle, the battle of Saraighat was guerrilla warfare.

Select the correct answer using the codes given below.

- a. 1 and 2 only
- b. 2 only
- c. 3 only
- d. 2 and 3 only

Q.59) What is "Hwasong-17", sometimes seen in the news?

- a. A Chinese Navigation Satellite System
- b. A North Korean ballistic missile system
- c. A defence collaboration between Japan and South Korea.
- d. A rover for international space station

Q.60) Consider the following statements regarding Central Depositories Services India Ltd (CDSL):

1. CDSL is a government-registered share depository, alongside its other state-owned counterpart National Securities Depository Ltd (NSDL).
2. Arth is a CSR Initiative from Central Depository Services (India) Ltd. with a mission to make financial education simple and accessible for all.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only

- c. Both 1 and 2
- d. Neither 1 nor 2

Q.61) With reference to Indian economy, consider the following statements:

1. A loan write-off refers to the selling of advances by a bank.
2. Credit-deposit ratio reflects the liquidity and capital adequacy of a bank

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.62) 'Global Gender Gap Report' is prepared by the

- a. The World Bank
- b. International Monetary Fund
- c. World Economic Forum
- d. Organization for Economic Cooperation and Development

Q.63) Consider the following statements regarding Guru Tegh Bahadur:

1. His sermons delivered in a mix of Sanskrit and Braj languages.
2. He was the contemporary of Aurangzeb.
3. He was also honoured at Guwahati's Kamakhya temple.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.64) With reference to Biodiversity Heritage sites, consider the following statements:

1. They are unique, ecologically fragile ecosystems that need protection.
2. As per Biodiversity Act 2000, Central Governments may notify such sites.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.65) 'Champions of the Earth' is an award launched by

- a. The World Meteorological Organisation
- b. The Intergovernmental Panel on Climate Change
- c. The UNEP

d. The UNFCCC Secretariat

Q.66) Consider the following statements regarding the Nyingma Sect of Buddhism:

1. Nyingmapa's trace their translation lineage back to the Samye Monastery, the first Tibetan Buddhist monastery in Tibet.
2. The Nyingma sect is also known as the orange Hat sect because its Lamas wear red robes and hats.

Which of the following statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.67) Consider the following statements regarding Sangeet Natak Academy:

1. It is the apex body which was set up in 1953 for the preservation and promotion of the vast intangible heritage of India.
2. The Chairman of the Akademi is appointed by the Vice President of India for a term of three years.
3. It is an autonomous body of the Ministry of Culture, Government of India.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.68) Consider the following statements regarding the Centre for Development of Telematics (C-DOT):

1. It is a registered 'public funded research institution' with the Ministry of Communication and IT, Government of India.
2. The Union Minister of Communication and IT acts as its President.

Which of the above statements is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.69) The Kutia Kondh Tribes often mentioned in news belong to

- a. Andhra Pradesh
- b. West Bengal
- c. Madhya Pradesh
- d. Odisha

Q.70) With reference to India's satellites, consider the following statements:

1. EOS-6 is an Ocean sat series' satellite that carries two payloads.
2. The Anand is a nano satellite for miniaturised electro-optical payload.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.71) In which of the following regions of India are you most likely to come across the 'Jeypore Ground Gecko' in its natural habitat?

- a. Himalayan Mountains
- b. Salt marshes of West Bengal
- c. Western Ghats
- d. Eastern Ghats

Q.72) Consider the following statements regarding International Electrotechnical Commission (IEC):

1. The IEC is a global, not-for-profit membership organization that brings together more than 170 countries.
2. India is not a member of IEC.
3. Recently Vimal Mahendru elected as the IEC Vice President representing India.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.73) Consider the following:

1. Ocean Acidification
2. Overfishing
3. coral bleaching
4. Sunscreen chemicals

Which of the above can be threats for corals to survive?

- a. 1 2 and 3 only
- b. 2 3 and 4 only
- c. 1 3 and 4 only
- d. 1 2 3 and 4

Q.74) Consider the following statements regarding the Global Snow Leopard Ecosystem Protection Program (GSLEP):

1. The GSLEP is a first-of-its-kind intergovernmental alliance for the conservation of the snow leopard and its unique ecosystem.

2. Bishkek Declaration deals with the conservation of snow leopards.
3. The snow leopard range countries includes Afghanistan, Bhutan, China, India and Japan.

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.75) Consider the following:

1. Europium
2. Gadolinium
3. Morrum
4. Scandium

Which of the above are examples of Rare Earth Metals?

- a. 1 2 and 3 only
- b. 1 2 and 4 only
- c. 2 3 and 4 only
- d. All of the above

Q.76) With reference to the Indian economy, consider the following statements:

1. If the domestic inflation is too high, value of a currency depreciates.
2. An undervalued currency is beneficial in reducing account deficit.

Which of the statements given below is/are correct?

Q.77) Which of the following statements best describes "carbon sequestration"?

- a. Technology for decarbonising CO₂ from high polluting sectors
- b. Process by which carbon dioxide becomes a carbonate and cannot escape back to the atmosphere.
- c. Setting up smog towers to capture carbon dioxide across cities
- d. Thermal decomposition of organic matter to increase soil organic content

Q.78) Consider the following statements regarding Electoral Bond Scheme:

1. An Electoral Bond is like a promissory note that may be purchased by a person who is a citizen of India or incorporated or established in India.
2. All political parties are eligible for the scheme.
3. Only the State Bank of India has been authorised to issue and encash Electoral Bonds.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 3 only
- c. 2 and 3 only
- d. 1 2 and 3

KEY ANSWERS

1	c	17	b	33	b	49	b	65	c
2	b	18	a	34	d	50	c	66	c
3	a	19	c	35	a	51	d	67	c
4	c	20	a	36	b	52	c	68	b
5	c	21	a	37	b	53	d	69	d
6	b	22	a	38	a	54	b	70	c
7	a	23	b	39	c	55	b	71	d
8	c	24	d	40	a	56	c	72	c
9	d	25	b	41	b	57	d	73	d
10	d	26	c	42	d	58	b	74	a
11	b	27	a	43	b	59	b	75	b
12	c	28	d	44	c	60	c	76	c
13	b	29	c	45	d	61	b	77	a
14	a	30	b	46	d	62	c	78	b
15	c	31	c	47	a	63	b		
16	d	32	b	48	b	64	a		



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